SECTION 00 91 13

ADDENDUM

No. 1

Owner:	**Oceana County Road Commission**	Date:	**December 17, 2025**
Project:	**Structure 14792 Under Stony Lake Road (M-20)**		
Project No.:	**868960**		
Engineer:	**Fleis & VandenBrink Engineering**		

NOTICE TO ALL PROSPECTIVE BIDDERS

BIDS DUE: **NO CHANGE: **January 26, 2026 at 2:00 p.m.**** -- ISSUED TO ALL PLANHOLDERS OF RECORD

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This Addendum is a part of the Contract Documents and modifies the previously issued Bidding Documents. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may result in rejection of the Bid.

SPECIFICATION CHANGES:

ITEM NO. 1:

Section: SP 00 41 00 BID FORM.

Delete specification in its entirety and replace with attached SP 00 41 00 BID FORM.

ITEM NO. 2:

Section: SP 01 22 00 MEASUREMENT AND PAYMENT.

Delete specification in its entirety and replace with attached SP 01 22 00 MEASUREMENT AND PAYMENT.

ITEM NO. 3:

Section: SP 99 96 98 APPENDIX E

Delete SPECIAL PROVISION FOR PRECAST CONCRETE FOUNDATION SYSTEM, ERECT in its entirety and replace with attached SPECIAL PROVISION FOR PRECAST CONCRETE FOUNDATION SYSTEM, FURNISH AND ERECT.

ITEM NO. 4:

Section: SP 99 96 99 APPENDIX F.

a. Add attached Scope Memo to Bidding Contractors from Contech/Ryan Loeprich.
b. Add approved Contech precast structure Contract Drawings.
c. Add approved Contech precast structure Fabrication Drawings.

DRAWING CHANGES

ITEM NO. 1:

Sheet: C-102 PLAN & PROFILE

Delete Sheet C-102 in its entirety and replace with attached C-102 PLAN & PROFILE Sheet.

ITEM NO. 2:

Sheet: C-103 PLAN & PROFILE

Delete Sheet C-103 in its entirety and replace with attached C-103 PLAN & PROFILE Sheet.

ITEM NO. 3:
Sheet: C-105 PLAN & PROFILE
Delete Sheet C-105 in its entirety and replace with attached C-105 PLAN & PROFILE Sheet.

ITEM NO. 4:
Sheet: C-106 PLAN & PROFILE
Delete Sheet C-106 in its entirety and replace with attached C-106 PLAN & PROFILE Sheet.

ITEM NO. 5:
Sheet: C-107 PLAN & PROFILE
Delete Sheet C-107 in its entirety and replace with attached C-107 PLAN & PROFILE Sheet.

ITEM NO. 6:
Sheet: C-108 PLAN & PROFILE
Delete Sheet C-108 in its entirety and replace with attached C-108 PLAN & PROFILE Sheet.

ITEM NO. 7:
Sheet: C-109 PLAN & PROFILE
Delete Sheet C-109 in its entirety and replace with attached C-109 PLAN & PROFILE Sheet.

ITEM NO. 8:
Sheet: C-111 PLAN & PROFILE
Delete Sheet C-111 in its entirety and replace with attached C-111 PLAN & PROFILE Sheet.

ITEM NO. 9:
Sheet: C-112 PLAN & PROFILE
Delete Sheet C-112 in its entirety and replace with attached C-112 PLAN & PROFILE Sheet.

ITEM NO. 10:
Sheet: C-113 PLAN & PROFILE
Delete Sheet C-113 in its entirety and replace with attached C-113 PLAN & PROFILE Sheet.

ITEM NO. 11:
Sheet: C-114 PLAN & PROFILE
Delete Sheet C-114 in its entirety and replace with attached C-114 PLAN & PROFILE Sheet.

ITEM NO.12:
Sheet: C-115 PLAN & PROFILE
Delete Sheet C-115 in its entirety and replace with attached C-115 PLAN & PROFILE Sheet.

ITEM NO. 13:
Sheet: C-116 PLAN & PROFILE
Delete Sheet C-116 in its entirety and replace with attached C-116 PLAN & PROFILE Sheet.

ITEM NO. 14:
Sheet: C-117 PLAN & PROFILE
Delete Sheet C-117 in its entirety and replace with attached C-117 PLAN & PROFILE Sheet.

ITEM NO. 15:
Sheet: C-201 PLAN & PROFILE
Delete Sheet C-201 in its entirety and replace with attached C-201 NOTES & TYPICAL SECTIONS Sheet.

ITEM NO. 16:

Sheet: C-202 PLAN & PROFILE

Delete Sheet C-202 in its entirety and replace with attached C-202 NOTES & TYPICAL SECTIONS Sheet.

ATTACHMENTS:

- SP 00 41 00 BID FORM
- SP 01 22 00 MEASUREMENT AND PAYMENT
- Special Provision for Precast Concrete Foundation System, Furnish and Erect
- Contech Scope Memo to Bidding Contractors
- Approved Contech Contract Drawings
- Approved Contech Fabrication Drawings
- Plan sheet C-102
- Plan sheet C-103
- Plan sheet C-105
- Plan sheet C-106
- Plan sheet C-107
- Plan sheet C-108
- Plan sheet C-109
- Plan sheet C-111
- Plan sheet C-112
- Plan sheet C-113
- Plan sheet C-114
- Plan sheet C-115
- Plan sheet C-116
- Plan sheet C-117
- Plan sheet C-201
- Plan sheet C-202

END OF SECTION

SECTION 00 41 00

BID FORM

ARTICLE 1 - OWNER & BIDDER

1.01 This Bid is submitted to: **Oceana County Road Commission**
3501 Polk Road
Hart, MI 49420

1.02 Name of Project: **Structure 14792 Under Stony Lake Road (M-20)**

1.03 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 - ATTACHMENTS TO THIS BID

2.01 The following documents are submitted with and made a condition of this Bid.

A. Required Bid security;

B. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids;

C. Contractor's license number as evidence of Bidder's State Contractor's License or a covenant by Bidder to obtain said license within the time for acceptance of Bids;

ARTICLE 3 - BASIS OF BID

3.01 *Unit Price Bids*

A. Bidder will perform the following Work at the indicated unit prices:

Item No.	Description	Unit	Est. Quantity	Bid Unit Price	Bid Amount
1	General Conditions, Bonds, and Insurance, Max. 5%	LSum	1		
2	Traffic Control	LSum	1		
3	Soil Erosion Control	LSum	1		
4	Contractor Staking	LSum	1		
5	Subgrade Undercutting, Type II	Cyd	100		
6	Trench Undercut and Backfill	Cyd	50		
7	Stormwater Treatment, Check Dam, Stone	Each	8		
~~8~~	~~Culv, Rem, 24 to 48 inch~~	~~Each~~	~~1~~		

Item No.	Description	Unit	Est. Quantity	Bid Unit Price	Bid Amount
9	Curb and Gutter, Rem	Ft	200		
10	HMA Surface, Rem	Syd	4,140		
11	Cold Milling HMA Surface	Syd	1,160		
12	Culv, Precast Arch, Excavation & Grading	LSum	1		
13	Trenching	Sta	19.0		
14	Roadway Grading	Sta	5.0		
15	Road Grade Biaxial Geogrid	Syd	312		
16	Subbase, CIP	Cyd	2,660		
17	Aggregate Base, 6 inch	Syd	1,785		
18	Aggregate Base, 8 inch	Syd	2,050		
19	Aggregate Base, Conditioning	Syd	1,800		
20	Aggregate Base	Ton	50		
21	Shld, Cl II, Modified	Ton	265		
22	HMA, 4EML	Ton	1,322		
23	HMA Approach	Ton	18		
~~24~~	~~Hand Patching~~	~~Ton~~	~~24~~		
25	Shared Use Path, Conc, Decorative, Stamped, 9 inch	Sft	3,200		
26	Driveway Opening, Conc, Det M	Ft	75		
27	Curb and Gutter, Conc, Det B2	Ft	780		
28	Curb and Gutter, Conc, Det F4	FT	100		
29	Curb, Conc, Det E4	Ft	262		
30	Concrete Spillway	Ft	40		
31	Trench Drain, ADA Compliant	Each	2		
32	Foundation Underdrain, 6 inch	Ft	600		
33	Culvert, 12 inch	Ft	416		
34	Culvert, 24 inch	Ft	184		
35	Flared End Section, 12 inch	Each	2		

Item No.	Description	Unit	Est. Quantity	Bid Unit Price	Bid Amount
36	Flared End Section, 24 inch	Each	3		
37	Storm Catch Basin, 48 inch Dia	Each	5		
38	Dr Structure Cover, Type G	Each	5		
39	Storm Sewer, 12 inch	Ft	92		
40	Video Taping Sewer and Culv Pipe	Ft	1,196		
41	Ditch Cleanout	Sta	15		
42	Riprap, Plain	Syd	31		
43	Guardrail Approach Terminal, Type 2M	Each	4		
44	Guardrail, Type MGS-8, 72 inch Post	Ft	550		
45	Guardrail, Long Span, Det MGS-3	Each	2		
46	Guardrail Reflector	Each	14		
47	Ornamental Fence	Ft	125		
48	Monument Preservation	Each	1		
49	Monument Box	Each	1		
50	Monument Box Adjust	Each	1		
51	Sign, Type III, Rem	Each	1		
52	Sign, Type III A	Sft	18		
53	Sign, Type III, Rem, Salv, Reinstall	Each	2		
54	Post, Steel, 3 lb.	Ft	88		
55	Reflective Panel for Permanent Sign Support, 6 foot	Each	4		
56	Pavt Mrkg, Wet Reflective, Polyurea, 6 inch, White	Ft	4,585		
57	Pavt Mrkg, Wet Reflective, Polyurea, 6 inch, Yellow	Ft	8,535		
58	Pavt Mrkg, Polyurea, Rt Turn Arrow Sym	Each	2		
59	Pavt Mrkg, Polyurea, Lt Turn Arrow Sym	Each	5		
60	Recessing Pavt Mrkg, Longit	Ft	12,720		
61	Recessing Pavt Mrkg, Transv	Sft	114		

Item No.	Description	Unit	Est. Quantity	Bid Unit Price	Bid Amount
62	Pavt Mrkg, Longit, 6 inch Or Less Width, Rem	Ft	11,650		
63	Grass Restoration	Syd	12,600		
64	Mulch Blanket	Syd	6,400		
65	Backfill, Structure, CIP	Cyd	1,890		
66	Aggregate	Cyd	170		
67	Excavation, Fdn	Cyd	3,538		
68	Aggregate Base, 10 inch	Syd	220		
69	Geotextile, Separator, Non Woven	Syd	500		
70	Underdrain, Fdn, 4 inch	Ft	220		
71	Underdrain, Fdn, 6 inch	Ft	470		
72	Underdrain Outlet, 4 inch	Ft	20		
73	Underdrain, Outlet Ending, 4 inch	Ft	20		
74	_Culv, Precast Arch, Erect	Ft	70		
75	_Precast Conc Foundation System, Erect	LSum	1		
76	Joint, Contraction, Cp	Ft	76		
77	Joint, Contraction, C3p	Ft	120		
78	Lane Tie, Epoxy Anchored	Each	25		
79	Reinforcement, Steel, Epoxy Coated	Lb	1,997		
80	Liner, PVC, 30 mil	Syd	450		
81	Conc, Grade 3500	Cyd	135		
82	Conc, Grade 4500	Cyd	55		
83	_Staining Simulated Masonry	Syd	90		
84	Conc Surface Coating	Syd	90		
85	_Concrete Surface Coating	Ft	95		
86	Bridge Railing, Aesthetic Parapet Tube	Ft	76		
87	Post, Flexible, Delineator	Each	28		
88	Site Lighting	LSum	1		

Item No.	Description	Unit	Est. Quantity	Bid Unit Price	Bid Amount
89	Electrical Distribution	LSum	1		
90	Cash Allowance (Electrical Service)	Dlr	6,000		
91	Turf Reinforcement Mat	Syd	700		
92	Sign, Type IIIB	Sft	13		
Total of All Unit Price Bid Items				**$**	

B. Bidder acknowledges that:
1. each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and
2. estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

ARTICLE 4 - TIME OF COMPLETION

4.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

4.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 5 - BIDDER'S ACKNOWLEDGEMENTS; ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 *Bid Acceptance Period*

A. This Bid will remain subject to acceptance for 90 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.02 *Instructions to Bidders*

A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

5.03 *Receipt of Addenda*

A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

5.04 *Subcontractor and Supplier List:*

A. Bid is submitted on the basis of the use of the following Subcontractors

Work Item	Firm	City
Bituminous Paving		
Concrete Work		
Earthwork		
Traffic Control		
Dewatering		
Surface Restoration		

ARTICLE 6 - BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Bidder's Representations*

A. In submitting this Bid, Bidder represents the following:
1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.
7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
8. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

6.02 *Bidder's Certifications*

A. The Bidder certifies the following:
1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
3. Bidder has not solicited or induced any individual or entity to refrain from bidding.
4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:
   a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.
   b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.
   c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.
   d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

BIDDER hereby submits this Bid as set forth above:

Bidder: _____
(typed or printed name of organization)

By: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.

Attest: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

Address for giving notices:

_____

_____

_____

Bidder's Contact:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Phone: _____

Email: _____

Address: _____

_____

_____

Bidder's Contractor License No.: (if applicable) _____

END OF SECTION

SECTION 01 22 00

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 SUMMARY:

This Section includes, but is not necessarily limited to, descriptions of the method of measurement and basis of payment criteria applicable to the Work.

1.02 MEASUREMENT OF QUANTITIES:

A. Measurement devices:
   1. Weigh scales:
      a. Inspected, tested and certified.
   2. Platform scales:
      a. Of enough size and capacity to accommodate the conveying vehicle.
   3. Metering devices:
      a. Inspected, tested and certified.

B. Measurement by weight:
   1. Concrete reinforcing steel rolled or formed steel or other metal shapes will be measured by handbook weights.
   2. Welded assemblies will be measured by handbook weights.

C. Measurement by volume:
   1. Measured by cubic dimension using mean length, width and height or thickness.

D. Measurement by area:
   1. Measured by square dimension using mean length and width or radius.

E. Linear measurement:
   1. Measured by linear dimension, at the item centerline.

1.03 MEASUREMENT AND PAYMENT SCHEDULE:

A. The following schedule outlines the method of measurement and basis of payment to be used on the project. Requirements for materials and methods described under each item are included in the related specification SECTION.

Item 1. General Conditions, Bonds, and Insurance, Max 5%: Shall be paid for on a lump sum basis for the Contractor's costs to provide required bonds and insurances, mobilization and miscellaneous requirements stipulated in Contract Documents. This quantity shall not exceed five percent (5%) of the total contract amount.

- 50% will be paid on the first Application for Payment.
- 25% will be paid when 40%* of the project is complete.
- 25% will be paid when 80%* of the project is complete.

*Measured as the value of the Work completed relative to the current contract value not including the value of this item.

Item 2. Traffic Control: Shall be paid for on a lump sum basis complete, furnished, installed, maintained, moved, and removed, including minor traffic devices, barricades, traffic regulator control, temporary construction signs, pavement marking, maintenance gravel, lighted arrows, portable changeable message signs and all related work required to maintain traffic, regardless of relocations, to protect the work area in accordance with the plans and the *MDOT Michigan Manual of Uniform Traffic Control Devices* and to re-open the road to traffic.

- 35% will be paid when the full extent of the proposed traffic control devices are deployed.
- 35% will be paid when 40%* of the project is complete.
- 30% will be paid when 80%* of the project is complete.

*Measured as the value of the Work completed relative to the current contract value not including the value of this item.

Item 3. Soil Erosion Control: Shall be paid for on a lump sum basis complete, installed, maintained, moved, and removed, including all materials or implements necessary for Contractor to provide all required soil erosion and sedimentation control (SESC) and obtain SESC permit as required.

- 60% will be paid when the full extent of the proposed soil erosion control devices are deployed.
- 20% will be paid when 40%* of the project is complete.
- 20% will be paid when 80%* of the project is complete.

*Measured as the value of the Work completed relative to the current contract value not including the value of this item.

Item 4. Contractor Staking: Shall be paid for on a lump sum basis complete for all equipment, time, and labor required to provide the lines, grades, and elevations for work identified herein and conforming to MDOT section 824.03 for the duration of the project.

- 40% will be paid when the full extent of the proposed traffic control devices are deployed.
- 30% will be paid when 40%* of the project is complete.
- 30% will be paid when 80%* of the project is complete.

*Measured as the value of the Work completed relative to the current contract value not including the value of this item.

Item 5. Subgrade Undercutting, Type II: Measured and paid for by the unit volume as directed by the Engineer. Includes removal and disposal of existing unsuitable material and replacement with compacted Class II material.

Item 6. Trench Undercut and Backfill: Measured and paid for by the unit volume as directed by the Engineer. Includes removal and disposal of existing unsuitable material and replacement with compacted Class II material to the bottom of pipe bedding.

Item 7. Stormwater Treatment, Check Dam, Stone: Permanent check dams shall be paid for individually, constructed in accordance with MDOT special provision 20RC208(A750) and placed where shown on plans or directed by Engineer.

~~Item 8. Culv, Rem, 24 to 48 inch: Measured and paid for by the unit regardless of length, including excavation, removal, backfill and disposal of the pipe and any end treatments removed.~~

Item 9. Curb and Gutter, Rem: Measured and paid by the unit length along the face of the curb including saw-cutting, and disposal regardless of curb & gutter dimensions and the presence of reinforcing.

Item 10. HMA Surface, Rem: Measured and paid for by the unit area including saw-cutting and disposal, regardless of HMA thickness. This item includes removal of both HMA roadways and driveways.

Item 11. Cold Milling HMA Surface: Measured and paid for by the unit area to cold mill the HMA surface to the depth specified.

Item 12. Culv, Precast Arch, Excavating & Grading: Shall be paid for on a lump sum basis for clearing brush, shrubs and trees less than 6-inch diameter and all earthwork, grading and compaction necessary to place and construct the precast structure and concrete shared use path to proposed grades as shown on the plans. Work includes removal and import of soil, ditching, rough grading, shaping, fine grading, compaction and any removals not otherwise called out as individual pay items.

Item 13. Trenching: Measured and paid by the unit length and measured on the ground surface along the proposed edge of the roadway. This item includes all rough grading, shaping, fine grading, and earthwork necessary to construct the proposed concrete curb and gutter including berm grading, ditches and swales as necessary. This item includes the removal and import of soil to achieve the specified cross section. This item also includes the areas associated with street intersections. No additional payment will be made for the length along the edges of intersecting roadways.

Item 14. Roadway Grading: Measured and paid by the unit length and measured on the ground surface along the proposed centerline of the roadway. This item includes all rough grading, shaping, fine grading, and earthwork necessary to construct the proposed road sections to the proposed widths including drive approaches, ditches and swales as shown in the plans. This item includes the removal and import of soil to achieve the specified grades. This item also includes the areas associated with street intersections. No additional payment will be made for the length along the centerline of intersecting roadways. This item includes providing temporary vehicular access through construction utilizing millings or gravel to temporary allow access for residents, emergency vehicles, through traffic, etc.

Item 15. Road Grade Biaxial Geogrid: Measured and paid for by the unit area placed in accordance with MDOT section 803.

Item 16. Subbase, CIP: Calculated and paid by the unit volume from the proposed street cross section compacted in place where pre-authorized by the Engineer. Where existing soils are adequate for subbase as determined by the Engineer, payment for subbase will not be made and shaping of the existing material shall be included in grading items.

Item 17. Aggregate Base, 6 inch: Measured and paid by the unit area, placed and compacted and fine graded. This item includes aggregate base under the roadway as well as under commercial HMA driveways.

Item 18. Aggregate Base, 8 inch: Measured and paid by the unit area, placed and compacted and fine graded. This item includes aggregate base under the concrete and HMA pathways.

Item 19. Aggregate Base, Conditioning: Measured and paid by the unit area completed in accordance with MDOT section 302.

Item 20. Aggregate Base: Measured and paid by the unit volume, placed and compacted and fine graded. This item includes aggregate base where directed by Engineer to correct base irregularities and restore cross slope to existing aggregate base prior to HMA paving.

Item 21. Shld, Cl II, Modified: Measured and paid by the unit area, placed and compacted in accordance with MDOT section 307 and Special Provision 20RD307(A885).

Item 22. HMA, 4EML: Measured and paid by the unit weight by tallying load tickets for placed and compacted HMA. Submit load tickets to Engineer at time of HMA delivery. Report all weigh-backs to the Engineer promptly following the paving operation. Payment shall include road mainline, intersection approaches, and miscellaneous asphalt handwork. HMA used in driveways will be paid for under HMA Approach. HMA used in specified curb trenching areas will be paid for under Hand Patching.

Item 23. HMA Approach: Measured and paid by the unit weight by tallying load tickets for placed and compacted HMA. Submit load tickets to Engineer at time of HMA delivery. Report all weigh-backs to the Engineer promptly following the paving operation. Payment shall include HMA used in driveways and where specified.

~~Item 24. Hand Patching: Measured and paid by the unit weight by tallying load tickets for placed and compacted HMA. Submit load tickets to Engineer at time of HMA delivery. Report all weigh-backs to the Engineer promptly following the paving operation. Payment shall include HMA used in curb trenching areas of M-20 or where specified.~~

Item 25. Shared Use Path, Conc, Decorative, Stamped, 9 inch: Measured and paid for by the square foot including providing and placing all joint materials; expansion joints, sawcutting, and cure.

Item 26. Driveway Opening, Conc, Det M: Measured and paid by the unit length as measured along edge of metal including expansion materials and reinforcing bars constructed per MDOT R-29 series standard plan, where shown on plan or directed by Engineer.

Item 27. Curb and Gutter, Conc, Det B2: Measured and paid by the unit length as measured along edge of metal including expansion materials and reinforcing bars.

Item 28. Curb and Gutter, Conc, Det F4: Measured and paid by the unit length as measured along edge of metal including expansion materials and reinforcing bars

Item 29. Curb, Conc, Det E4: Measured and paid by the unit length as measured along edge of path in accordance with plan detail, including expansion materials and reinforcing bars.

Item 30. Concrete Spillway: Measured and paid by the unit length as measured along the centerline from curb and gutter to riprap including all excavation, grading, and removal of surplus materials and constructed in accordance with MDOT section 802 and standard plan R-35 series.

Item 31. Trench Drain, ADA Compliant: Measured and paid individually for all materials, equipment and labor required to install trench drain in accordance with plans and manufacturer's recommendations, including ADA compliant ductile iron grate.

Item 32. Foundation Underdrain, 6 inch: Measured and paid by the unit length for all foundation and trench drain pipe not otherwise called out as individual pay items, installed and backfilled, including geotextile sock and connections to storm manholes or catch basins from center to center of structures and connection points.

Item 33. Culvert, 12 inch: Measured and paid by the unit length for the size identified and measured on the ground surface along the pipe centerline. Item includes excavation and backfill.

Item 34. Culvert, 24 inch: Measured and paid by the unit length for the size identified and measured on the ground surface along the pipe centerline. Item includes excavation and backfill.

Item 35. Flared End Section, 12 inch: Each flared end section shall be paid for individually including excavation and backfill.

Item 36. Flared End Section, 24 inch: Each flared end section shall be paid for individually including excavation, backfill, and steel grate in accordance with MDOT Standard Plan R-92 series.

Item 37. Storm Catch Basin, 48 inch Dia: Each catch basin shall be paid for individually including excavation and backfill.

Item 38. Dr Structure Cover, Type G: Measured and paid for individually installed and adjusted to final grade.

Item 39. Storm Sewer, 12 inch: Measured and paid by the unit length for the size identified and measured on the ground surface along the pipe centerline from center to center of structures and connection points. This item includes excavation and backfill.

Item 40. Video Taping Sewer and Culv Pipe: Measured and paid for by the unit length in accordance with MDOT section 402.

Item 41. Ditch Cleanout: Measured and paid by the unit length on the ground surface along the centerline of the existing ditch and completed in accordance with MDOT section 307.

Item 42. Riprap, Plain: Measured and paid by unit area including geotextile fabric below the rip rap toed in place.

Item 43. Guardrail Approach Terminal, Type 2M: Measured and paid for individually including all materials and labor necessary for complete installation in accordance with MDOT section 807 and Special Detail R-62 series.

Item 44. Guardrail, Type MGS-8, 72 inch Post: Measured and paid for by the unit length for all materials and labor necessary for complete installation in accordance with MDOT section 807 and Special Detail R-60 & R-73 series. Includes all posts regardless of depth or anchorage required for a complete installation.

Item 45. Guardrail, Long Span, Det MGS-3: Measured and paid for individually for all materials and labor necessary for complete installation in accordance with MDOT section 807 and Special Detail R-60 & R-73 series. Includes all posts regardless of depth or anchorage required for a complete installation.

Item 46. Guardrail Reflector: Measured and paid for individually including all materials and labor necessary for complete installation in accordance with MDOT section 807 and Special Detail R- R-60 & R-73 series.

Item 47. Ornamental Fence: Measured and paid for by the linear foot including all materials, labor, and equipment required to provide and anchor the fence in the shared use path and at the culvert per manufacturer's recommendations and as shown in plans.

Item 48. Monument Preservation: Each monument shall be paid for individually and in accordance to MDOT 821.04.

Item 49. Monument Box: Each box shall be paid for individually and in accordance to MDOT 821.04.

Item 50. Monument Box Adjust: Each adjustment shall be paid for individually and in accordance to MDOT 821.04

Item 51. Sign, Type III, Rem: Counted and paid for by the unit including removal of hardware and post where indicated in the plans.

Item 52. Sign, Type III A: Measured and paid for by the square foot of sign face installed including all attaching devices, brackets and hardware, and labor to fabricate and erect.

Item 53. Sign, Type III, Rem, Salv, Reinstall: Counted and paid by the unit including removal, storage and protection from damage, loading, transporting, unloading, required mounting hardware, and erecting the salvaged sign on a new or existing support post where specified. New posts, if specified, will be paid for separately.

Item 54. Post, Steel, 3 lb: Measured and paid for by the foot of length installed, above and below grade.

Item 55. Reflective Panel for Permanent Sign Support, 6 foot: Measured and paid by the unit placed in accordance with MDOT section 810.

Item 56. Pavt Mrkg, Wet Reflective, Polyurea, 6 inch, White: Measured and paid by the unit length placed in accordance with MDOT section 811.

Item 57. Pavt Mrkg, Wet Reflective, Polyurea, 6 inch, Yellow: Measured and paid by the unit length placed in accordance with MDOT section 811.

Item 58. Pavt Mrkg, Polyurea, Rt Turn Arrow Sym: Measured and paid for individually placed in accordance with MDOT section 811.

Item 59. Pavt Mrkg, Polyurea, Lt Turn Arrow Sym: Measured and paid for individually placed in accordance with MDOT section 811.

Item 60. Recessing Pavt Mrkg, Longit: Measured and paid by the unit length placed in accordance with MDOT section 811 including surface preparation if necessary.

Item 61. Recessing Pavt Mrkg, Transv: Measured and paid by the unit length placed in accordance with MDOT section 811 including surface preparation if necessary.

Item 62. Pavt Mrkg, Longit, 6 inch Or Less Width, Rem: Measured and paid by the unit length removed in accordance with MDOT section 812..

Item 63. Grass Restoration: Measured and paid by the unit area including grading, topsoiling, seeding, fertilizer nutrient, mulching, and mulch anchoring. Grass Restoration outside of public right-of-way or easement will not be paid for.

Item 64. Mulch Blanket: Measured and paid by the unit area including furnishing, placing and anchoring the blankets only at locations authorized by the Engineer prior to mulch blanket placement.

Item 65. Backfill, Structure, CIP: Measured and paid for by the cubic yard in accordance with MDOT section 206.

Item 66. Aggregate: Measured and paid for by the cubic yard in accordance with MDOT section 206.

Item 67. Excavation, Fdn: Measured and paid for by the cubic yard in accordance with MDOT section 206.

Item 68. Aggregate Base, 10 inch: Measured and paid for by the square yard in accordance with MDOT section 302.

Item 69. Geotextile, Separator, Non Woven: Measured and paid for by the square yard in accordance with MDOT section 308.

Item 70. Underdrain, Fdn, 4 inch: Measured and paid for by the foot in accordance with MDOT section 404.

Item 71. Underdrain, Fdn, 6 inch: Measured and paid for by the foot in accordance with MDOT section 404.

Item 72. Underdrain Outlet, 4 inch: Measured and paid for by the foot in accordance with MDOT section 404.

Item 73. Underdrain, Outlet Ending, 4 inch: Measured and paid for by the foot in accordance with MDOT section 404.

Item 74. Culv, Precast Arch, Erect: Measured and paid for by the lump sum as indicated in the Special Provision for Culv, Precast Arch, Erect.

Item 75. Precast Conc Foundation System, Erect: Measured and paid for by the foot as indicated in the Special Provision for Culv, Precast Conc Foundation System, Erect.

Item 76. Joint, Contraction, Cp: Measured and paid for by the foot in accordance with MDOT section 602.

Item 77. Joint, Contraction, C3p: Measured and paid for by the foot in accordance with MDOT section 602.

Item 78. Lane Tie, Epoxy Anchored: Measured and paid for by the unit each in accordance with MDOT section 603.

Item 79. Reinforcement, Steel, Epoxy Coated: Measured and paid for by the pound in accordance with MDOT section 706.

Item 80. Liner, PVC, 30 mil: Measured and paid for by the pound in accordance with MDOT section 706.

Item 81. Conc, Grade 3500: Measured and paid for by the cubic yard in accordance with MDOT section 706.

Item 82. Conc, Grade 4500: Measured and paid for by the cubic yard in accordance with MDOT section 706.

Item 83. Staining Simulated Masonry: Measured and paid for by square yard as indicated in the Special Provision for Staining Simulated Masonry.

Item 84. Conc Surface Coating: Measured and paid for by the square yard in accordance with MDOT section 710 and as indicated on the drawings.

Item 85. Concrete Surface Coating: Measured and paid for by the square yard in accordance with the Special Provision for Concrete Surface Coating and as indicated on the drawings.

Item 86. Bridge Railing, Aesthetic Parapet Tube: Measured and paid for by the foot in accordance with MDOT section 711.

Item 87. Post, Flexible, Delineator: Measured and paid for by the unit each in accordance with MDOT section 810.

Item 88. Site Lighting: will be paid on a lump sum basis for all labor, materials and equipment necessary to furnish and install surface mounted sconces, surface mounted and recessed luminaires, LED area heads, poles, and all related items as shown and detailed on the drawings. Payment includes concrete foundations, hardware, and all materials not otherwise called out as individual pay items necessary to furnish a complete and fully operational lighting system.

Item 89. Electrical Distribution: will be paid on a lump sum basis for all labor, materials and equipment necessary to furnish and install, conduit, wiring, fusing, fuse holders, electrical hand holes, electrical enclosure and lighting control panel,

concrete foundations, and all related items as shown and detailed on the drawings. Payment includes permits, inspections and all materials not otherwise called out as individual pay items necessary to furnish a complete and fully operational lighting system.

Item 90. Cash Allowance: Measured and paid by the US dollar for expenditures made by the contractor for work identified in Section 01 21 13 CASH ALLOWANCES. The cash allowance value paid will be the value paid by the contractor from copies of invoices provided.

Item 91. Turf Reinforcement Mat: Measured and paid by the unit area including furnishing, placing and anchoring the turf reinforcement mat in accordance with MDOT section 816 at locations authorized by the Engineer prior to turf reinforcement mat placement.

Item 92. Sign, Type IIIB: Measured and paid for by the square foot of sign face installed including all attaching devices, brackets and hardware, and labor to fabricate and erect.

Other:

- Sawcutting existing bituminous or concrete pavement:
  - Included in removal items.
- Site improvements:
  - Include in cost of roadway items.
- Shoring:
  - All shoring required for construction, safety, and convenience will be considered temporary and included in construction items.
- Dewatering for Construction:
  - Included in cost of the utility.
- Granular material trench back-fill:
  - Included in cost of the utility.
- Bedding area trench backfill:
  - Included in cost of the utility.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

OCEANA COUNTY ROAD COMMISSION

SPECIAL PROVISION
FOR
PRECAST CONCRETE FOUNDATION SYSTEM, FURNISH AND ERECT

CON:GLEG 1 of 2 12-17-25

a. Description. This work consists of furnishing and erecting the precast concrete footing system and reinforcing steel, or approved alternative, as shown on the plans and in accordance with section 706 of the MDOT Standard Specifications for Construction and this special provision. Submit working drawings per section 104.02 of the MDOT Standard Specifications for Construction.

Coordinate the fabrication of the precast system with the approved working drawings for the precast concrete arch and wall sections, and obtain the precast system and other materials from Contech Engineered Solutions (CES). Coordinate delivery and erection with CES.

b. Materials.
Furnish, place, and compact MDOT 34G material under the precast footing forms, as indicated on the drawings.

Fill the precast foundation system, after placement is accepted by the Engineer, with MDOT Grade 3500 concrete. Pour, finish and cure concrete in accordance with section 706 of the Standard Specifications for Construction. Cast-in-place concrete is paid for separately as Conc, Grade 3500.

c. Construction Handling and Erection of Elements. The Contractor is responsible for proper handling, lifting, and erection of all elements without damage.

Inspect each element visually for evidence of damage or defect before, during and after critical operations and as often as necessary to ensure adequate quality control. Immediately bring all such evidence of damage or defects to the attention of the Engineer. The extent and frequency of inspection by the Engineer for quality assurance is the Engineer's prerogative. Elements may be inspected at any time during construction as deemed necessary by the Engineer to monitor compliance with this special provision.

If any damage has occurred during shipment, immediately notify the Engineer. Erection of such damaged elements into the structure cannot proceed without authorization from the Engineer.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	**Pay Unit**
Precast Conc Foundation System, Furn	Lump Sum
Precast Conc Foundation System, Erect	Lump Sum

Precast Conc Foundation System, Furn, includes furnishing the precast concrete foundation system fabricated by Contech Engineered Solutions, as indicated on the plans, or approved alternative.

Precast Conc Foundation System, Erect, includes furnishing, placing, and compacting MDOT 34G material and erecting the precast concrete segments including all materials, equipment, tools, placing reinforcing steel, labor costs, and incidental items required to complete the work.

ADDENDUM NO. 1

To: Bidding Contractors
Date: December 9, 2025
Project: Lewis Adventure Farms Ped Tunnel

Project Background

Oceana County and Contech developed a design and purchase agreement for the pedestrian tunnel in late September 2025. Contech received approved shop drawings from Fleis & Vandenbrink (EOR) and Great Lakes Engineering (Tunnel Design) in early December 2025.

Project Timing

Contech has been provided a target delivery timeframe of April 2026 and will coordinate with the selected contractor.

Precast Sections & Pick Weights

Precast element	Sections	Heavy Pick Weight
Arch Units	9	24.4 tons
Headwall	2	7.6 tons
Wingwall	8	12.4 tons

Precast Tunnel - Structure Design & Scope

- Design & Fabrication will follow MDOT Standards of Construction, Section 406; with MDOT quality control requirements.
- Contech will provide MDOT Joint Material with package including 9" Joint Wrap, Butyl Rope and primer; Waterproof membrance (PVC Liner) supply and construction, by others.
- Formliner will be precast into wall sections; Concrete Coatings to be supplied and applied, by others.
- Contech will provide hardwood shims for placement in keyway, and necessary hardware for installation of wall systems.
- Structure will be designed to allow to mount lighting fixtures in electrical plan. All lighting fixtures and installation by others.
- Onsite Field Representative during installation of precast elements included; pre-construction meeting required.

Tunnel and Wall Foundations

- Contech will provide a quote for Express® Precast Foundations. Alternatively, Contech will also offer pricing for engineering services to design CIP foundations, if determined as the preferred approach. Contractors can also hire their own engineer for foundation design, using the following design data.

DESIGN DATA

DESIGN LOADING:
BRIDGE UNITS: MDOT HL-93
HEADWALLS: EARTH PRESSURE + LIVE LOAD SURCHARGE
WINGWALLS: EARTH PRESSURE + LIVE LOAD SURCHARGE
DESIGN FILL HEIGHT: 1"-0" MIN. TO 2'-0" MAX.
FROM TOP OF CROWN TO TOP OF PAVEMENT.
DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION, 2020.
NOMINAL BEARING RESISTANCE (ARCH): 10,400 PSF*
FACTORED BEARING RESISTANCE (ARCH): 5,200 PSF*
SERVICE APPLIED BEARING PRESSURE (ARCH): 3,390 PSF**
NOMINAL BEARING RESISTANCE (WINGWALL): 11,400 PSF*
FACTORED BEARING RESISTANCE (WINGWALL): 5,700 PSF*

*FOUNDATION EXCAVATION AND SUBGRADE PREPARATION SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT FOR THIS PROJECT PREPARED BY MATERIALS TESTING CONSULTANTS, INC., DATED JUNE 16, 2025.

**SERVICE BEARING PRESSURE EXCEEDS ASSUMED SERVICE BEARING PRESSURE IN GEOTECHNICAL REPORT (1,350 PSF), TO BE CONFIRMED ACCEPTABLE.

Contact Information:

Ryan Loeprich
Senior State Bridge Consultant - Contech Engineered Solutions
Mobile: 616-403-5525
Email: rloeprich@conteches.com

ADDENDUM NO. 1

NOTES

GENERAL NOTES:

1. THIS BRIDGE HAS BEEN DESIGNED FOR GENERAL SITE 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.

2. PRIOR TO CONSTRUCTION, CONTRACTOR MUST VERIFY ALL ELEVATIONS SHOWN THROUGH THE ENGINEER.

3. ONLY CONTECH ENGINEERED SOLUTIONS LLC, THE CON/SPAN® APPROVED PRECASTER IN MICHIGAN MAY PROVIDE THE STRUCTURE DESIGNED IN ACCORDANCE WITH THESE PLANS.

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. CONTECH ENGINEERED SOLUTIONS LLC ASSUMES NO LIABILITY FOR DESIGN OF ANY ALTERNATE OR SIMILAR TYPE STRUCTURES.

DESIGN DATA

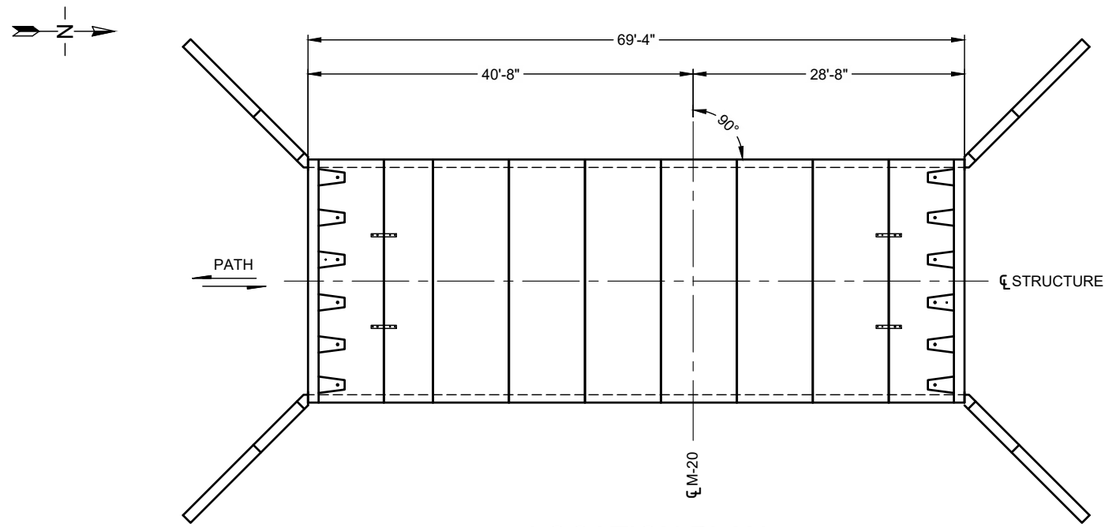
DESIGN LOADING:
- BRIDGE UNITS: MDOT HL-93 (MOD)
- HEADWALLS: EARTH PRESSURE + LIVE LOAD SURCHARGE
- WINGWALLS: EARTH PRESSURE + LIVE LOAD SURCHARGE

DESIGN FILL HEIGHT: 1'-9" MIN. TO 2'-3" MAX. FROM TOP OF CROWN TO TOP OF PAVEMENT.
DESIGN METHOD (ARCHES, HEADWALLS & WINGWALLS): LOAD AND RESISTANCE FACTOR DESIGN PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION, 2020 & MDOT DESIGN MANUAL

MATERIALS

PRECAST UNITS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH CON/SPAN® SPECIFICATIONS.

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN



LOCATION PLAN

NOT TO SCALE

Reviewed by:
Great Lakes Engineering Group, LLC.
APPROVED
By: M. Lessens @ 8:10 am
on 12/15/25
GREAT LAKES ENGINEERING GROUP, LLC

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

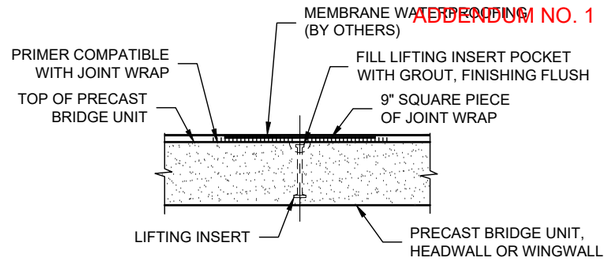
CON/SPAN BRIDGE SYSTEMS

CONTRACT DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

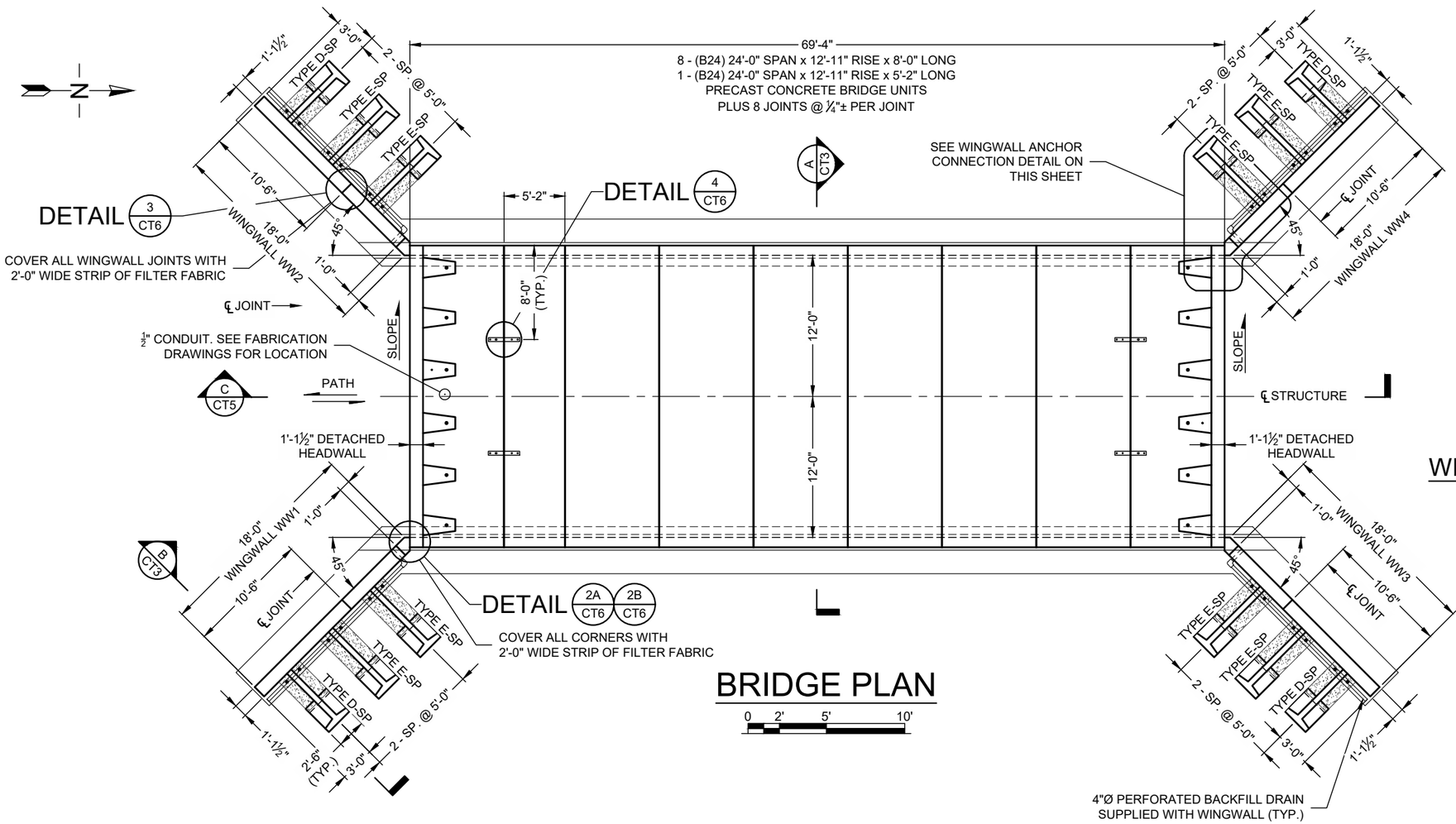
PROJECT No.:	SEQ. No.:	DATE:
781640	010	11/4/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: KMH	APPROVED: PAC	
SHEET NO.: CT1 OF CT8		

ADDENDUM NO. 1



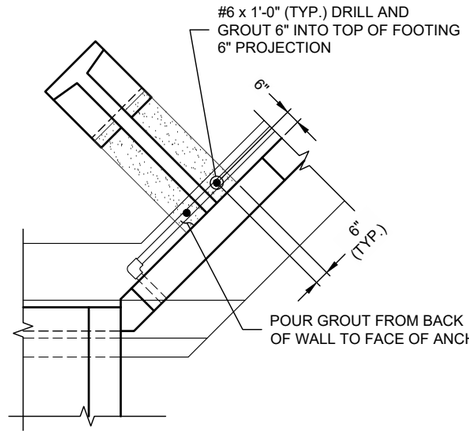
TYPICAL LIFT INSERT SEALING DETAIL

NOT TO SCALE



BRIDGE PLAN

0 2' 5' 10'



WINGWALL ANCHOR CONNECTION DETAIL

NOTE:
FOUNDATION TO BE DESIGNED BY OTHERS

APPROVED

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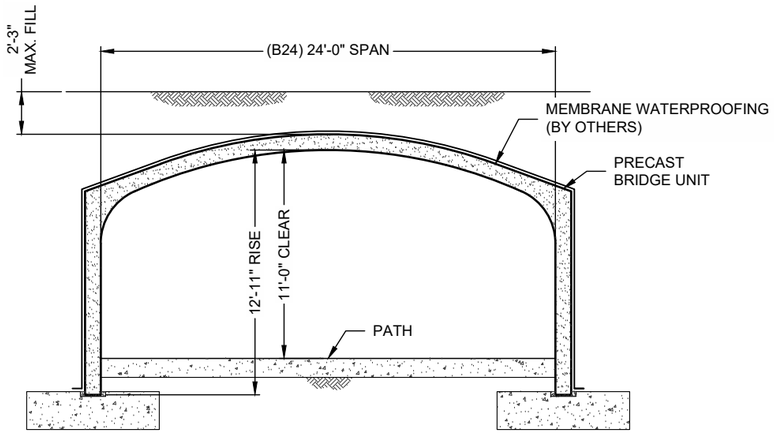
CONSPAN BRIDGE SYSTEMS

CONTRACT DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	11/4/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: KMH	APPROVED: PAC	
SHEET NO.: CT2 OF CT8		

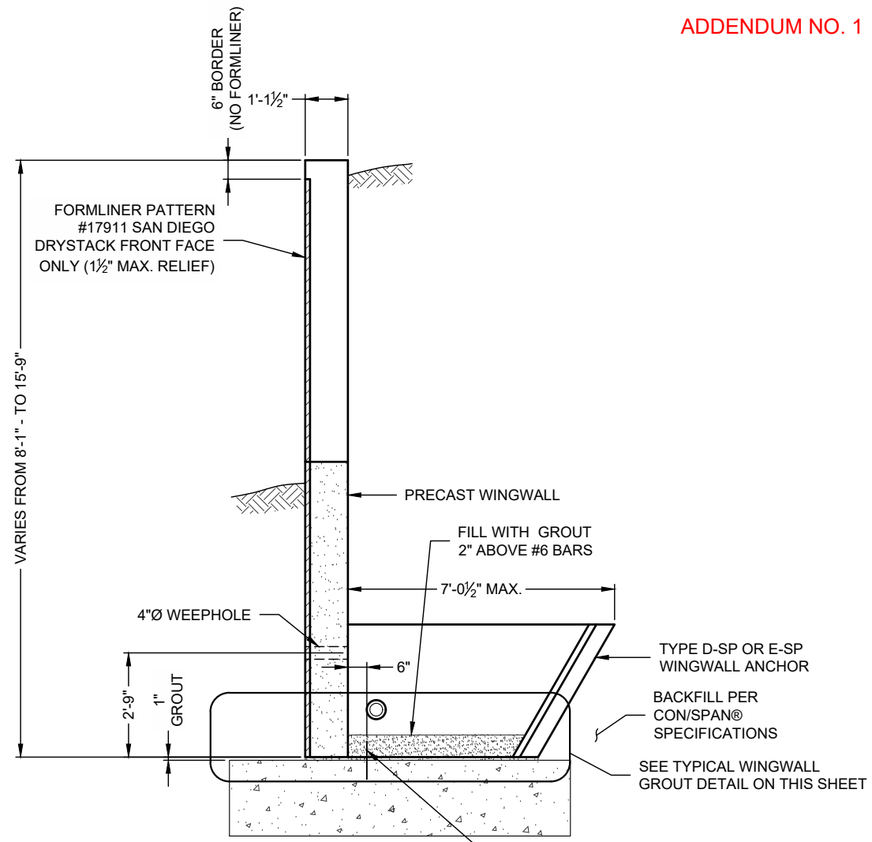
ADDENDUM NO. 1



SECTION A CT2

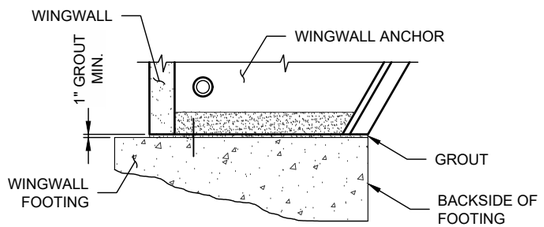
0 2' 4' 8'

NOTE:
FOUNDATION TO BE DESIGNED
BY OTHERS



SECTION B CT2

0 1' 2' 4'



NOTES:
- MINIMUM 1" GROUT UNDER WINGWALL LEG & ANCHOR STEM.
- AREA BETWEEN WINGWALL FOOTING AND WINGWALL ANCHOR SHALL BE GROUTED SOLID BEFORE BACKFILL.
- FORM BACKSIDE OF FOOTING TO DIMENSIONS SHOWN ON FOUNDATION PLAN.

TYPICAL WINGWALL GROUT DETAIL

NOT TO SCALE

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CON/SPAN BRIDGE SYSTEMS

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OCEANA COUNTY, MICHIGAN

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781640	010	11/4/2025
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CHECKED: KMH	APPROVED: PAC	
SHEET NO.: CT3 OF CT8		

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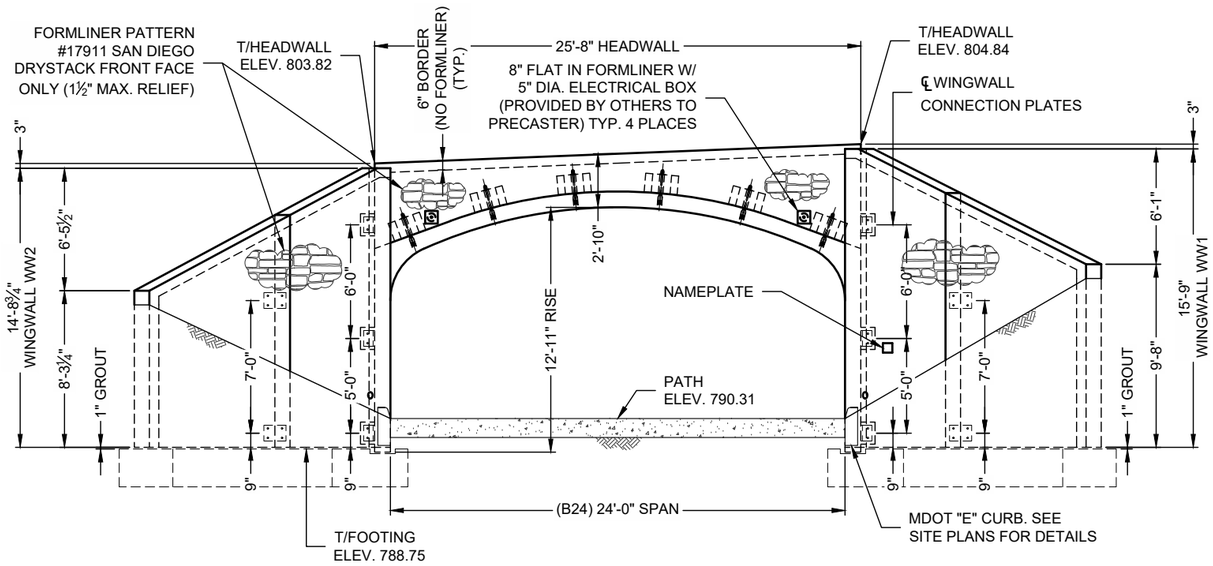
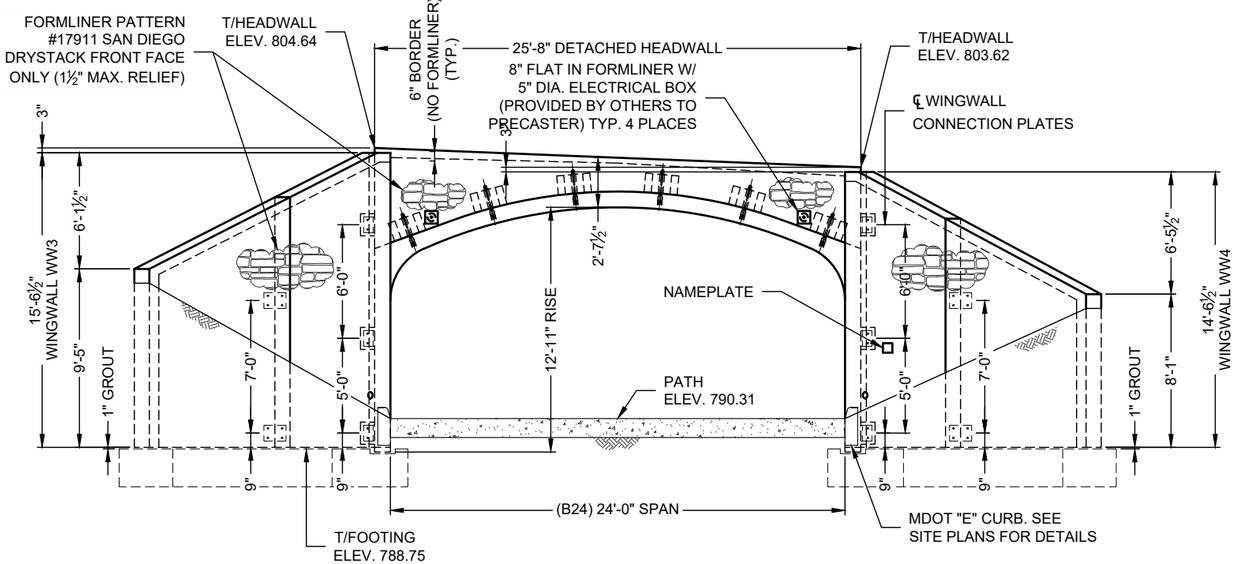
ADDENDUM NO. 1



SOUTH END ELEVATION

0 2' 4' 8'



NORTH END ELEVATION

0 2' 4' 8'

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CONSPAN BRIDGE SYSTEMS

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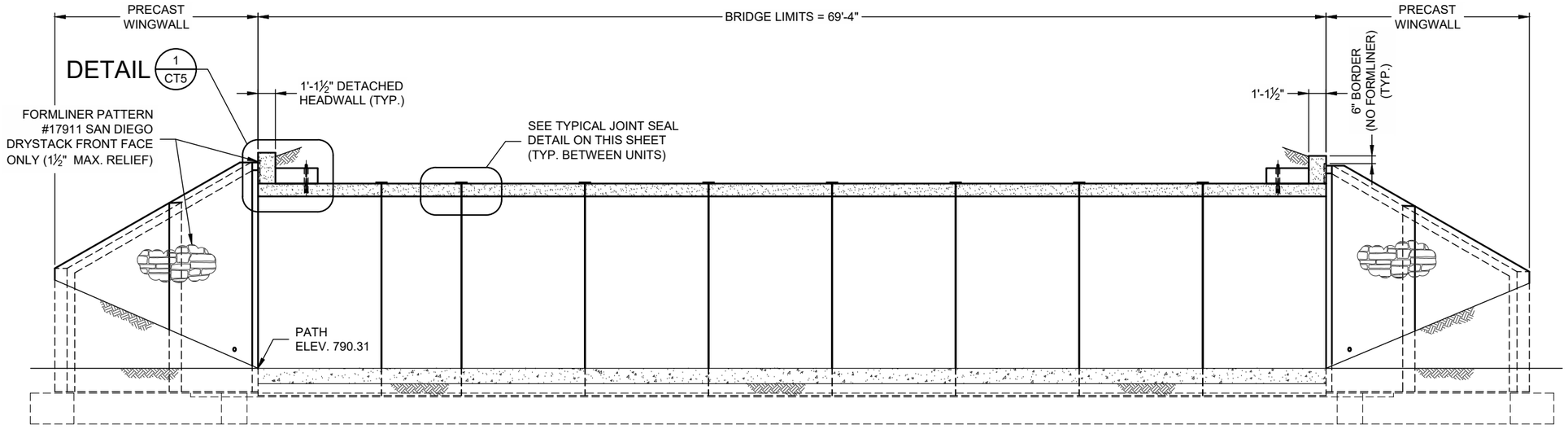
CHECKED: KMH	APPROVED: PAC	
SHEET NO.: CT4 OF CT8		

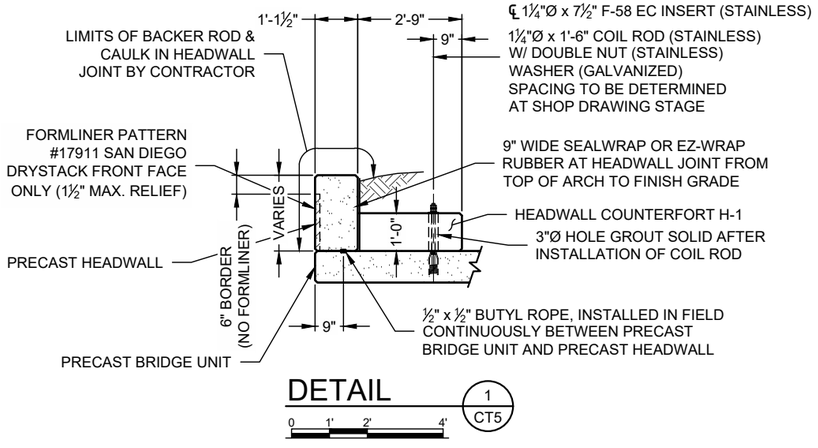
ADDENDUM NO. 1



SECTION C CT2

0 2' 4' 8'

NOTE:
FOUNDATION TO BE DESIGNED BY OTHERS



DETAIL 1 CT5

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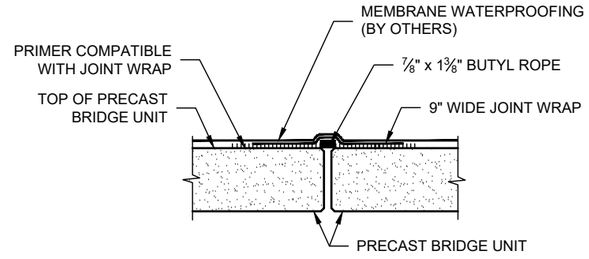

TYPICAL JOINT SEAL DETAIL

NOT TO SCALE

APPROVED

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CONSPAN BRIDGE SYSTEMS

CONTRACT DRAWING

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781640	010	11/4/2025
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CHECKED: KMH	APPROVED: PAC	
SHEET NO.: CT5 OF CT8		

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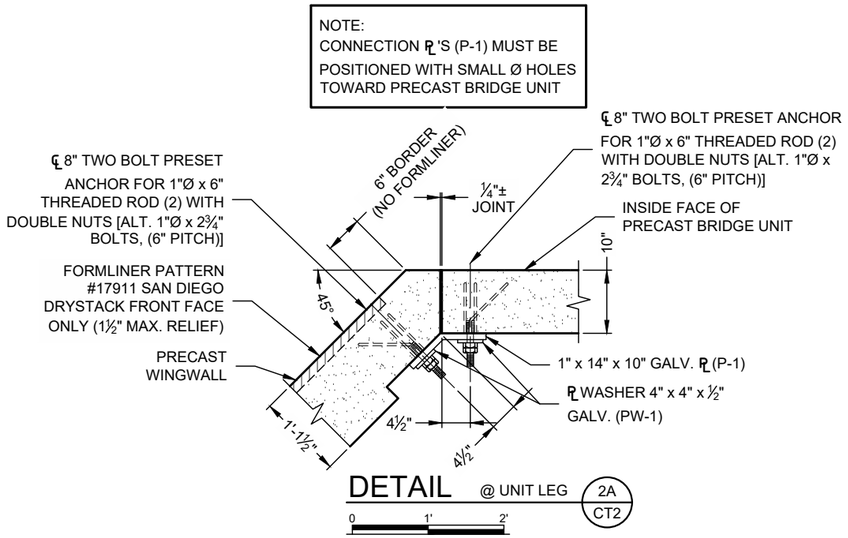

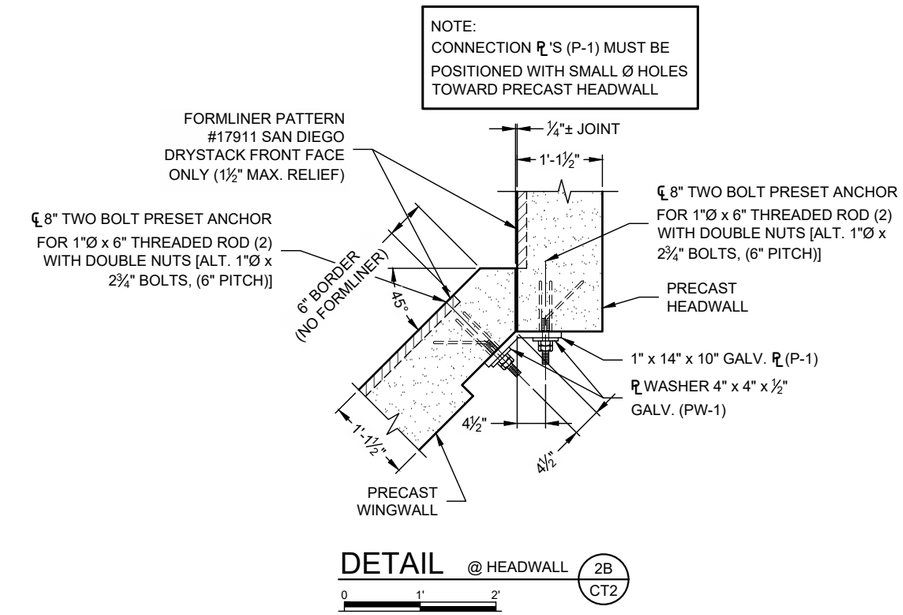

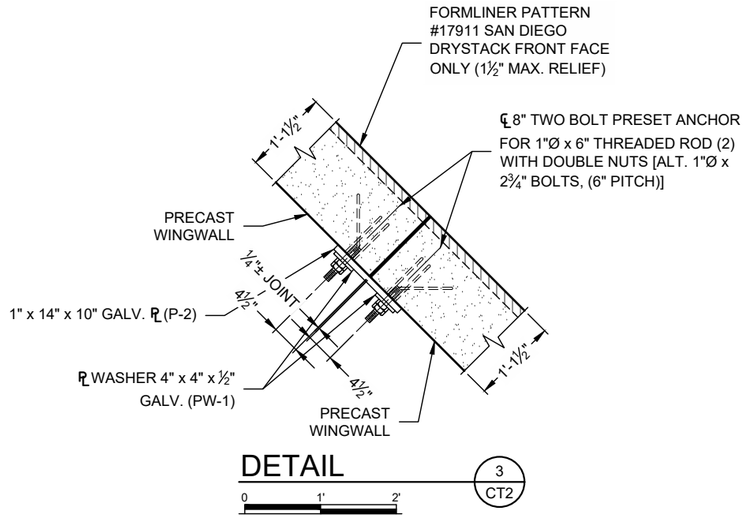

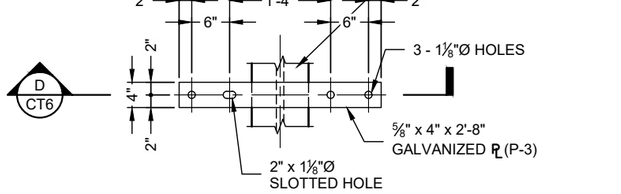

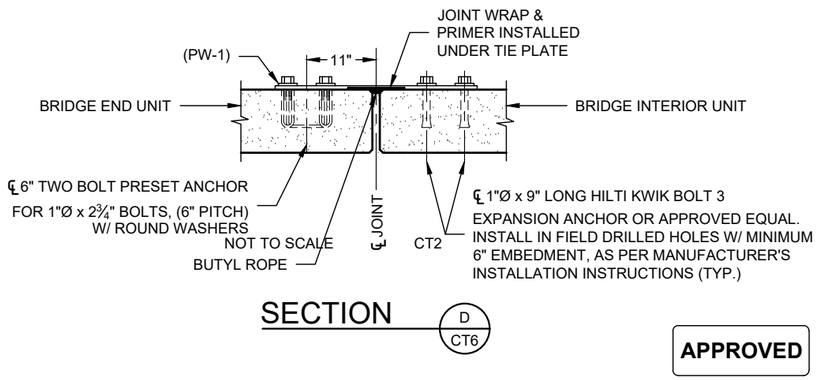

APPROVED

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800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

CONTRACT DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
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OCEANA COUNTY, MICHIGAN

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DESIGNED: JDR		DRAWN: PJW
CHECKED: KMH		APPROVED: PAC
SHEET NO.: CT6 OF CT8		

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

ADDENDUM NO. 1

1. DESCRIPTION
   1.1. TYPE - THIS WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTING A CON/SPAN® BRIDGE SYSTEM 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 SHALL GOVERN.
   1.2. DESIGNATION - PRECAST REINFORCED CONCRETE CON/SPAN® BRIDGE UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY SPAN AND RISE. PRECAST REINFORCED CONCRETE WINGWALLS AND HEADWALLS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT, AND DEFLECTION ANGLE. PRECAST REINFORCED CONCRETE EXPRESS™ FOUNDATION UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT AND WIDTH.

2. DESIGN
   2.1. SPECIFICATIONS - THE PRECAST ELEMENTS ARE DESIGNED IN ACCORDANCE WITH THE "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" 9TH EDITION, ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2020. 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.)

3. MATERIALS
   3.1. CONCRETE - THE CONCRETE FOR THE PRECAST ELEMENTS SHALL BE AIR-ENTRAINED WHEN INSTALLED IN AREAS SUBJECT TO FREEZE-THAW CONDITIONS, COMPOSED OF PORTLAND CEMENT, FINE AND COARSE AGGREGATES, ADMIXTURES AND WATER. AIR-ENTRAINED CONCRETE SHALL CONTAIN 6 ± 2 PERCENT AIR. THE AIR- ENTRAINING ADMIXTURE SHALL CONFORM TO AASHTO M154. THE MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE AS SHOWN ON THE SHOP DRAWINGS.
      3.1.1.1. PORTLAND CEMENT - SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATIONS C150-TYPE I, TYPE IL, TYPE II, OR TYPE III CEMENT.
      3.1.2. AGGREGATE - SHALL CONSIST OF STONE HAVING A MAXIMUM SIZE OF 1 INCH. AGGREGATE SHALL MEET REQUIREMENTS FOR ASTM C33.
      3.1.3. 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 CONCRETE.
      3.1.4. CALCIUM CHLORIDE - THE ADDITION TO THE MIX OF CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE WILL NOT BE PERMITTED.
      3.1.5. 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 SACKS) PER CUBIC YARD OF CONCRETE.
   3.2. STEEL REINFORCEMENT
      3.2.1. THE MINIMUM STEEL YIELD STRENGTH SHALL BE 60,000 PSI, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS.
      3.2.2. ALL REINFORCING STEEL FOR THE PRECAST ELEMENTS SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE DETAILED SHOP DRAWINGS SUBMITTED BY THE MANUFACTURER.
      3.2.3. REINFORCEMENT SHALL CONSIST OF WELDED WIRE REINFORCING CONFORMING TO ASTM SPECIFICATION A 1064, OR DEFORMED STEEL BARS CONFORMING TO ASTM SPECIFICATION A 615, GRADE 60. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY CONSIST OF WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS.
   3.3. STEEL HARDWARE
      3.3.1. BOLTS AND THREADED RODS FOR WINGWALL CONNECTIONS SHALL CONFORM TO ASTM A 307. NUTS SHALL CONFORM TO AASHTO M292 (ASTM A194) GRADE 2H. ALL BOLTS, THREADED RODS AND NUTS USED IN WINGWALL CONNECTIONS SHALL BE MECHANICALLY ZINC COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
      3.3.2. STRUCTURAL STEEL FOR WINGWALL CONNECTION PLATES AND PLATE WASHERS SHALL CONFORM TO AASHTO M 270 (ASTM A 709) GRADE 36 AND SHALL BE HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.3. INSERTS FOR WINGWALLS SHALL BE 1" DIAMETER TWO-BOLT PRESET WINGWALL ANCHORS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700 AND SHALL BE ELECTRO GALVANIZED IN ACCORDANCE WITH ASTM B633 SC-1.
      3.3.4. FERRULE LOOP INSERTS SHALL BE F-64 FERRULE LOOP INSERTS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700 AND SHALL BE ELECTRO GALVANIZED.
      3.3.5. HOOK BOLTS USED IN ATTACHED HEADWALL CONNECTIONS SHALL BE ASTM A307.
      3.3.6. INSERTS FOR DETACHED HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL, EXPANDED COIL INSERTS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700. COIL RODS AND NUTS USED IN HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL. WASHERS USED IN HEADWALL CONNECTIONS SHALL BE EITHER AISI TYPE 304 STAINLESS STEEL PLATE WASHERS OR AASHTO M270 (ASTM A709) GRADE 36 PLATE WASHERS HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.7. MECHANICAL SPLICES OF REINFORCING BARS SHALL BE MADE USING THE DOWEL BAR SPLICER SYSTEM AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700, AND SHALL CONSIST OF THE DBDI SPLICE SYSTEM (DOWEL BAR SPLICER AND DOWEL-IN), OR AS MANUFACTURED BY BARSPLICE PRODUCTS INC, DAYTON, OHIO, (937)-275-8700, AND SHALL CONSIST OF BARSPLICER XP TYPE 2 SYSTEM.

4. MANUFACTURE OF PRECAST ELEMENTS - SUBJECT TO THE PROVISIONS OF SECTION 5, BELOW, THE PRECAST ELEMENT DIMENSION AND REINFORCEMENT DETAILS SHALL BE AS PRESCRIBED IN THE PLAN AND SHOP DRAWINGS PROVIDED BY THE MANUFACTURER.
   4.1. FORMS - THE FORMS USED IN MANUFACTURE SHALL BE SUFFICIENTLY RIGID AND ACCURATE TO MAINTAIN THE REQUIRED PRECAST ELEMENT DIMENSIONS WITHIN THE PERMISSIBLE VARIATIONS GIVEN IN SECTION 5 OF THESE SPECIFICATIONS. ALL CASTING SURFACES SHALL BE OF A SMOOTH MATERIAL.
   4.2. PLACEMENT OF REINFORCEMENT
      4.2.1. PLACEMENT OF REINFORCEMENT IN PRECAST BRIDGE UNITS - THE COVER OF CONCRETE OVER THE OUTSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2" MINIMUM. THE COVER OF CONCRETE OVER THE INSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 1½" MINIMUM, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS. THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 1" NOR MORE THAN 2" FROM THE ENDS OF EACH SECTION. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING SINGLE OR MULTIPLE LAYERS OF WELDED WIRE FABRIC (NOT TO EXCEED 3 LAYERS), SUPPLEMENTED WITH A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS, WHEN NECESSARY. WELDED WIRE FABRIC SHALL BE COMPOSED OF CIRCUMFERENTIAL AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, 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 BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW. THE ENDS OF THE LONGITUDINAL DISTRIBUTION REINFORCEMENT SHALL BE NOT MORE THAN 3" AND NOT LESS THAN 1½" FROM THE ENDS OF THE BRIDGE UNIT.
      4.2.2. 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 OUTSIDE CORNER.
      4.2.3. PLACEMENT OF REINFORCEMENT FOR PRECAST WINGWALLS AND HEADWALLS - THE COVER OF CONCRETE OVER THE LONGITUDINAL AND TRANSVERSE REINFORCEMENT SHALL BE 2" MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 1½" NOR MORE THAN 3". REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC, OR A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, 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 FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
      4.2.4. PLACEMENT OF REINFORCMENT FOR PRECAST FOUNDATION UNITS - THE COVER OF CONCRETE OVER THE BOTTOM REINFORCEMENT SHALL BE 3 INCHES MINIMUM. THE COVER OF CONCRETE FOR ALL OTHER REINFORCEMENT SHALL BE 2 INCHES MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 2 INCHES NOR MORE THAN 3 INCHES. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC OR A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, 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 FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
   4.3. LAPS, WELDS, SPACING
      4.3.1. 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 FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.10.8.2.5B AND 5.10.8.5.2. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.10.8.2.5A AND 5.10.8.5.1. THE OVERLAP OF WELDED WIRE FABRIC SHALL BE MEASURED BETWEEN THE OUTER-MOST LONGITUDINAL WIRES OF EACH FABRIC SHEET. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.10.8.2.1 FOR SPLICES OTHER THAN TENSION SPLICES, THE OVERLAP SHALL BE A MINIMUM OF 1'-0" FOR WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS. THE SPACING CENTER TO CENTER OF THE CIRCUMFERENTIAL WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL DISTRIBUTION STEEL FOR EITHER LINE OF REINFORCING IN THE TOP SLAB SHALL BE NOT MORE THAN 1'-4".
      4.3.2. LAPS, WELDS, AND SPACING FOR PRECAST WINGWALLS, HEADWALLS AND FOUNDATIONS - SPLICES IN THE REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.10.8.2.5B AND 5.10.8.5.2. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.10.8.2.5A AND 5.10.8.5.1. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.10.8.2.1. THE SPACING CENTER-TO-CENTER OF THE WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 8".
   4.4. 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:
      4.4.1. STEAM CURING - THE PRECAST ELEMENTS MAY BE LOW-PRESSURE STEAM CURED BY A SYSTEM THAT WILL MAINTAIN A MOIST ATMOSPHERE.
      4.4.2. WATER CURING - THE PRECAST ELEMENTS MAY BE WATER CURED BY ANY METHOD THAT WILL KEEP THE SECTIONS MOIST.
      4.4.3. MEMBRANE CURING - A SEALING MEMBRANE CONFORMING TO THE REQUIREMENTS OF ASTM SPECIFICATION C309 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 APPLICATION OF THE COMPOUNDS AND SHALL BE DAMP WHEN THE COMPOUND IS APPLIED.
   4.5. STORAGE, HANDLING & DELIVERY
      4.5.1. STORAGE - PRECAST CONCRETE BRIDGE ELEMENTS SHALL BE LIFTED AND STORED IN "AS-CAST" POSITION. PRECAST CONCRETE HEADWALL AND WINGWALL UNITS ARE CAST, STORED AND SHIPPED IN A FLAT POSITION. THE PRECAST ELEMENTS SHALL BE STORED IN SUCH A MANNER TO PREVENT CRACKING OR DAMAGE. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE. THE UNITS SHALL NOT BE MOVED UNTIL THE CONCRETE COMPRESSIVE STRENGTH HAS REACHED A MINIMUM OF 2500 PSI (3000 PSI FOR SPANS >48 FEET), AND THEY SHALL NOT BE STORED IN AN UPRIGHT POSITION.
      4.5.2. HANDLING - HANDLING DEVICES SHALL BE PERMITTED IN EACH PRECAST ELEMENT FOR THE PURPOSE OF HANDLING AND SETTING. SPREADER BEAMS MAY BE REQUIRED FOR THE LIFTING OF PRECAST CONCRETE BRIDGE ELEMENTS TO PRECLUDE DAMAGE FROM BENDING OR TORSION FORCES.
      4.5.3. DELIVERY - PRECAST CONCRETE ELEMENTS MUST NOT BE SHIPPED UNTIL THE CONCRETE HAS ATTAINED THE SPECIFIED DESIGN COMPRESSIVE STRENGTH, OR AS DIRECTED BY THE DESIGN ENGINEER. PRECAST CONCRETE ELEMENTS MAY BE UNLOADED AND PLACED ON THE GROUND AT THE SITE UNTIL INSTALLED. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE.
   4.6. QUALITY ASSURANCE - THE PRECASTER SHALL DEMONSTRATE ADHERENCE TO THE STANDARDS SET FORTH IN THE NPCA QUALITY CONTROL MANUAL. THE PRECASTER SHALL MEET EITHER SECTION 4.6.1 OR 4.6.2
      4.6.1. CERTIFICATION - THE PRECASTER SHALL BE CERTIFIED BY THE PRECAST/PRESTRESSED CONCRETE INSTITUTE PLANT CERTIFICATION PROGRAM OR THE NATIONAL PRECAST CONCRETE ASSOCIATION'S PLANT CERTIFICATION PROGRAM PRIOR TO AND DURING PRODUCTION OF THE PRODUCTS COVERED BY THIS SPECIFICATION.
      4.6.2. QUALIFICATIONS, TESTING AND INSPECTION
         4.6.2.1. THE PRECASTER SHALL HAVE BEEN IN THE BUSINESS OF PRODUCING PRECAST CONCRETE PRODUCTS SIMILAR TO THOSE SPECIFIED FOR A MINIMUM OF THREE YEARS. HE SHALL MAINTAIN A PERMANENT QUALITY CONTROL DEPARTMENT OR RETAIN AN INDEPENDENT TESTING AGENCY ON A CONTINUING BASIS. THE AGENCY SHALL ISSUE A REPORT, CERTIFIED BY A LICENSED ENGINEER, DETAILING THE ABILITY OF THE PRECASTER TO PRODUCE QUALITY PRODUCTS CONSISTENT WITH INDUSTRY STANDARDS.
         4.6.2.2. THE PRECASTER SHALL SHOW THAT THE FOLLOWING TESTS ARE PERFORMED IN ACCORDANCE WITH THE ASTM STANDARDS INDICATED. TESTS SHALL BE PERFORMED AS INDICATED IN SECTION 6 OF THESE SPECIFICATIONS.
            4.6.2.2.1. AIR CONTENT: C231 OR C173
            4.6.2.2.2. COMPRESSIVE STRENGTH: C31,C39,C497
         4.6.2.3. THE PRECASTER SHALL PROVIDE DOCUMENTATION DEMONSTRATING COMPLIANCE WITH THIS SECTION TO CONTECH® ENGINEERED SOLUTIONS AT REGULAR INTERVALS OR UPON REQUEST.
         4.6.2.4. THE OWNER MAY PLACE AN INSPECTOR IN THE PLANT WHEN THE PRODUCTS COVERED BY THIS SPECIFICATION ARE BEING MANUFACTURED.
      4.6.3. DOCUMENTATION - THE PRECASTER SHALL SUBMIT PRECAST PRODUCTION REPORTS TO CONTECH® ENGINEERED SOLUTIONS AS REQUIRED.

5. PERMISSIBLE VARIATIONS
   5.1. BRIDGE UNITS
      5.1.1. INTERNAL DIMENSIONS - THE INTERNAL DIMENSION SHALL VARY NOT MORE THAN 1% FROM THE DESIGN DIMENSIONS NOR MORE THAN 1½" WHICHEVER IS LESS.
      5.1.2. SLAB AND WALL THICKNESS - THE SLAB AND WALL THICKNESS SHALL NOT BE LESS THAN THAT SHOWN IN THE DESIGN BY MORE THAN ¼". A THICKNESS MORE THAN THAT REQUIRED IN THE DESIGN SHALL NOT BE CAUSE FOR REJECTION.
      5.1.3. LENGTH OF OPPOSITE SURFACES - VARIATIONS IN LAYING LENGTHS OF TWO OPPOSITE SURFACES OF THE BRIDGE UNIT SHALL NOT BE MORE THAN ½" IN ANY SECTION, EXCEPT WHERE BEVELED ENDS FOR LAYING OF CURVES ARE SPECIFIED BY THE PURCHASER.
      5.1.4. LENGTH OF SECTION - THE UNDERRUN IN LENGTH OF A SECTION SHALL NOT BE MORE THAN ½" IN ANY BRIDGE UNIT.
      5.1.5. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN POSITION OF THE REINFORCEMENT SHALL BE ± ½", IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½" FOR THE OUTSIDE CIRCUMFERENTIAL STEEL OR BE LESS THAN 1" FOR THE INSIDE CIRCUMFERENTIAL STEEL AS MEASURED TO THE EXTERNAL OR INTERNAL SURFACE OF THE BRIDGE. THESE TOLERANCES OR COVER REQUIREMENTS DO NOT APPLY TO MATING SURFACES OF THE JOINTS.
      5.1.6. AREA OF REINFORCEMENT - THE AREAS OF STEEL REINFORCEMENT SHALL BE THE DESIGN STEEL AREAS AS SHOWN IN THE MANUFACTURER'S SHOP DRAWINGS. STEEL AREAS GREATER THAN THOSE REQUIRED SHALL NOT BE CAUSE FOR REJECTION. THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCEMENT SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCEMENT.
   5.2. WINGWALLS & HEADWALLS
      5.2.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ¼".
      5.2.2. LENGTH/HEIGHT OF WALL SECTIONS - THE LENGTH AND HEIGHT OF THE WALL SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.2.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½", IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½".
      5.2.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING. STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.
   5.3. FOUNDATION UNITS
      5.3.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.3.2. LENGTH/ HEIGHT/WIDTH OF FOUNDATION SECTIONS - THE LENGTH, HEIGHT AND WIDTH OF THE FOUNDATION UNITS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.3.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½", IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1".
      5.3.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING. STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.

6. TESTING/ INSPECTION
   6.1. TESTING
      6.1.1. TYPE OF TEST SPECIMEN - CONCRETE COMPRESSIVE STRENGTH SHALL BE DETERMINED FROM COMPRESSION TESTS MADE ON CYLINDERS OR CORES. FOR CYLINDER TESTING, A MINIMUM OF 4 CYLINDERS SHALL BE TAKEN FOR EACH BRIDGE ELEMENT. FOR CORE TESTING, A MINIMUM OF 2 CORES SHALL BE TAKEN FOR EACH BRIDGE ELEMENT. EACH ELEMENT SHALL BE CONSIDERED SEPARATELY FOR THE PURPOSE OF TESTING AND ACCEPTANCE.
      6.1.2. COMPRESSION TESTING - CYLINDERS SHALL BE MADE AND TESTED AS PRESCRIBED BY THE ASTM C39 SPECIFICATION. CYLINDERS SHALL BE CURED IN THE SAME ENVIRONMENT AS THE BRIDGE ELEMENTS. CORES SHALL BE OBTAINED AND TESTED FOR COMPRESSIVE STRENGTH FROM EACH ELEMENT IN ACCORDANCE WITH THE PROVISIONS OF THE ASTM C42 SPECIFICATION.
      6.1.3. 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, AND NO CYLINDER TESTED HAS A COMPRESSIVE STRENGTH LESS THAN 90% OF THE REQUIRED CONCRETE STRENGTH, THEN THE ELEMENT SHALL BE ACCEPTED. WHEN THE COMPRESSIVE STRENGTH OF THE CYLINDERS TESTED DOES NOT CONFORM TO THESE ACCEPTANCE CRITERIA, THE ACCEPTABILITY OF THE ELEMENT MAY BE DETERMINED AS DESCRIBED IN SECTION 6.1.4, BELOW.
      6.1.4. ACCEPTABILITY OF CORE TESTS - THE COMPRESSIVE STRENGTH OF THE CONCRETE IN A BRIDGE ELEMENT IS ACCEPTABLE WHEN EACH CORE TEST STRENGTH IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH. WHEN THE COMPRESSIVE STRENGTH OF A CORE TESTED IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN 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 BRIDGE ELEMENT IS ACCEPTABLE.
         6.1.4.1. 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.
         6.1.4.2. 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 USE.
         6.1.4.3. TEST EQUIPMENT - EVERY MANUFACTURER FURNISHING PRECAST ELEMENTS UNDER THIS SPECIFICATION SHALL FURNISH ALL FACILITIES AND PERSONNEL NECESSARY TO CARRY OUT THE TEST REQUIRED.
   6.2. INSPECTION - THE QUALITY OF MATERIALS, THE PROCESS OF MANUFACTURE, AND THE FINISHED PRECAST ELEMENTS SHALL BE SUBJECT TO INSPECTION BY THE PURCHASER.

7. 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 WITH A SMOOTH INTERIOR FREE OF APPRECIABLE IRREGULARITIES, ALL COMPATIBLE WITH THE PERMISSIBLE VARIATIONS IN SECTION 5, ABOVE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

8. WORKMANSHIP/ FINISH
   THE BRIDGE UNITS, WINGWALLS, HEADWALLS AND FOUNDATION UNITS SHALL BE SUBSTANTIALLY FREE OF FRACTURES. THE ENDS OF THE BRIDGE UNITS SHALL BE NORMAL TO THE WALLS AND CENTERLINE OF THE BRIDGE SECTION, WITHIN THE LIMITS OF THE VARIATIONS GIVEN IN SECTION 5, ABOVE, EXCEPT WHERE BEVELED ENDS ARE SPECIFIED. THE FACES OF THE WINGWALLS AND HEADWALLS SHALL BE PARALLEL TO EACH OTHER, WITHIN THE LIMITS OF VARIATIONS GIVEN IN SECTION 5, ABOVE. THE SURFACE OF THE PRECAST ELEMENTS SHALL 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.

9. 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.

10. REJECTION
    THE PRECAST ELEMENTS SHALL BE SUBJECT TO REJECTION ON ACCOUNT OF ANY OF THE SPECIFICATION REQUIREMENTS. INDIVIDUAL PRECAST ELEMENTS MAY BE REJECTED BECAUSE OF ANY OF THE FOLLOWING:
    10.1. FRACTURES OR CRACKS PASSING THROUGH THE WALL, EXCEPT FOR A SINGLE END CRACK THAT DOES NOT EXCEED ONE HALF THE THICKNESS OF THE WALL.
    10.2. DEFECTS THAT INDICATE PROPORTIONING, MIXING, AND MOLDING NOT IN COMPLIANCE WITH SECTION 4 OF THESE SPECIFICATIONS.
    10.3. HONEYCOMBED OR OPEN TEXTURE.
    10.4. DAMAGED ENDS, WHERE SUCH DAMAGE WOULD PREVENT MAKING A SATISFACTORY JOINT.

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
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800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

CONTRACT DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	11/4/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: KMH	APPROVED: PAC	
SHEET NO.: CT7 OF CT8		

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SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS (CONT'D)

ADDENDUM NO. 1

11. MARKING
EACH BRIDGE UNIT SHALL BE CLEARLY MARKED BY WATERPROOF PAINT. THE FOLLOWING SHALL BE SHOWN ON THE INSIDE OF THE VERTICAL LEG OF THE BRIDGE SECTION:
BRIDGE SPAN x BRIDGE RISE
DATE OF MANUFACTURE
NAME OR TRADEMARK OF THE MANUFACTURER

12. INSTALLATION PREPARATION
TO ENSURE CORRECT INSTALLATION OF THE PRECAST CONCRETE BRIDGE SYSTEM, CARE AND CAUTION MUST BE EXERCISED IN FORMING THE SUPPORT AREAS FOR BRIDGE UNITS, HEADWALL, AND WINGWALL ELEMENTS. EXERCISING SPECIAL CARE WILL FACILITATE THE RAPID INSTALLATION OF THE PRECAST COMPONENTS.

12.1. FOOTINGS
DO NOT OVER EXCAVATE FOUNDATIONS UNLESS DIRECTED BY SITE SOIL ENGINEER TO REMOVE UNSUITABLE SOIL.

THE SITE SOILS ENGINEER SHALL CERTIFY THAT THE BEARING CAPACITY MEETS OR EXCEEDS THE FOOTING DESIGN REQUIREMENTS, PRIOR TO THE CONTRACTOR POURING OF THE FOOTINGS.

THE BRIDGE UNITS AND WINGWALLS SHALL BE INSTALLED ON EITHER PRECAST OR CAST-IN-PLACE CONCRETE FOOTINGS. THE SIZE AND ELEVATION OF THE FOOTINGS SHALL BE AS DESIGNED BY THE ENGINEER. A KEYWAY SHALL BE FORMED IN THE TOP SURFACE OF THE BRIDGE FOOTING AS SPECIFIED ON THE PLANS. NO KEYWAY IS REQUIRED IN THE WINGWALL FOOTINGS, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

THE FOOTINGS SHALL BE GIVEN A SMOOTH FLOAT FINISH AND SHALL REACH A COMPRESSIVE STRENGTH OF 2,000 PSI BEFORE PLACEMENT OF THE BRIDGE AND WINGWALL ELEMENTS. BACKFILLING SHALL NOT BEGIN UNTIL THE FOOTING HAS REACHED THE FULL DESIGN COMPRESSIVE STRENGTH.

THE FOOTING SURFACE SHALL BE CONSTRUCTED IN ACCORDANCE WITH GRADES SHOWN ON THE PLANS. WHEN TESTED WITH A 10'-0" STRAIGHT EDGE, THE SURFACE SHALL NOT VARY MORE THAN ¼" IN 10'-0".

IF A PRECAST CONCRETE FOOTING IS USED, THE CONTRACTOR SHALL PREPARE A 4" THICK BASE LAYER OF COMPACTED GRANULAR MATERIAL THE FULL WIDTH OF THE FOOTING PRIOR TO PLACING THE PRECAST FOOTING.

THE FOUNDATIONS FOR PRECAST CONCRETE BRIDGE ELEMENTS AND WINGWALLS MUST BE CONNECTED BY REINFORCEMENT TO FORM ONE MONOLITHIC BODY. EXPANSION JOINTS SHALL NOT BE USED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF THE FOUNDATIONS PER THE PLANS AND SPECIFICATIONS.

13. INSTALLATION

13.1. GENERAL - THE INSTALLATION OF THE PRECAST CONCRETE ELEMENTS SHALL BE AS EXPLAINED IN THE PUBLICATION CON/SPAN BRIDGE SYSTEMS INSTALLATION HANDBOOK.

13.1.1. LIFTING - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT A CRANE OF THE CORRECT LIFTING CAPACITY IS AVAILABLE TO HANDLE THE PRECAST CONCRETE UNITS. THIS CAN BE ACCOMPLISHED BY USING THE WEIGHTS GIVEN FOR THE PRECAST CONCRETE COMPONENTS AND BY DETERMINING THE LIFTING REACH FOR EACH CRANE UNIT. SITE CONDITIONS MUST BE CHECKED WELL IN ADVANCE OF SHIPPING TO ENSURE PROPER CRANE LOCATION AND TO AVOID ANY LIFTING RESTRICTIONS. THE LIFT ANCHORS OR HOLES PROVIDED IN EACH UNIT ARE THE ONLY MEANS TO BE USED TO LIFT THE ELEMENTS. THE PRECAST CONCRETE ELEMENTS MUST NOT BE SUPPORTED OR RAISED BY OTHER MEANS THAN THOSE GIVEN IN THE MANUALS AND DRAWINGS WITHOUT WRITTEN APPROVAL FROM CONTECH® ENGINEERED SOLUTIONS.

13.1.2. CONSTRUCTION EQUIPMENT WEIGHT RESTRICTIONS - IN NO CASE SHALL EQUIPMENT OPERATING IN EXCESS OF THE DESIGN LOAD (HL-93) BE PERMITTED OVER THE BRIDGE UNITS UNLESS APPROVED BY CONTECH® ENGINEERED SOLUTIONS.

13.1.2.1. IN THE IMMEDIATE AREA OF THE BRIDGE UNITS, THE FOLLOWING RESTRICTIONS FOR THE USE OF HEAVY CONSTRUCTION MACHINERY DURING BACKFILLING OPERATIONS APPLY:

- NO CONSTRUCTION EQUIPMENT SHALL CROSS THE BARE PRECAST CONCRETE BRIDGE UNIT.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 4" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 10 TONS MAY CROSS THE BRIDGE.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 1'-0" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 30 TONS MAY CROSS THE BRIDGE.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED THE DESIGN COVER, OR 2'-0" MINIMUM, OVER THE CROWN OF THE PRECAST CONCRETE BRIDGE, CONSTRUCTION EQUIPMENT WITHIN THE DESIGN LOAD LIMITS FOR THE ROAD MAY CROSS THE PRECAST CONCRETE BRIDGE.

13.2. LEVELING PAD/SHIMS - THE BRIDGE UNITS AND WINGWALLS SHALL BE SET ON HARDBOARD SHIMS CONFORMING TO ASTM D1037 OR PLASTIC SHIMS (DAYTON SUPERIOR P-80, P-81 OR APPROVED EQUAL) MEASURING 5" x 5", MINIMUM, UNLESS SHOWN OTHERWISE ON THE PLANS. A MINIMUM GAP OF ½" SHALL BE PROVIDED BETWEEN THE FOOTING AND THE BOTTOM OF THE BRIDGE'S VERTICAL LEGS OR THE BOTTOM OF THE WINGWALL. ALSO, A SUPPLY OF ¼", ½" AND ¼" THICK HARDBOARD OR PLASTIC SHIMS FOR VARIOUS SHIMMING PURPOSES SHALL BE ON SITE.

13.3. PLACEMENT OF BRIDGE UNITS - THE BRIDGE UNITS SHALL BE PLACED AS SHOWN ON THE ENGINEER'S PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

13.4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE STRUCTURE SPAN DURING ALL PHASES OF INSTALLATION. DUE TO THE ARCH SHAPE, BRIDGE ELEMENTS WILL TEND TO SPREAD UNDER SELF-WEIGHT. IT IS IMPERATIVE THAT ANY LATERAL SPREADING OF THE BRIDGE ELEMENTS BE AVOIDED DURING AND AFTER THEIR PLACEMENT. GENERALLY, HORIZONTAL CABLE TIES OR TIE RODS ARE SHIPPED IN THE LARGER BRIDGE ELEMENTS TO ASSIST IN PREVENTING THIS SPREADING. CABLE TIES/TIE RODS SHALL NOT BE REMOVED UNTIL BRIDGE UNITS ARE GROUTED AND GROUT HAS CURED. IT IS RECOMMENDED THAT TEMPORARY HARDWOOD BLOCKS BE USED IN CONJUNCTION WITH THE CABLE TIES/TIE RODS TO MAINTAIN SPAN. IF, HOWEVER, DUE TO SITE RESTRICTIONS, THESE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO PLACEMENT OF THE BRIDGE ELEMENTS, THE CONTRACTOR MUST NOTIFY CONTECH (MANUFACTURER) AND REQUEST A SUGGESTED INSTALLATION PROCEDURE.

IN ADDITION, IF THE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO SETTING ARCH UNITS, THE FOLLOWING QUALITY CONTROL PROCEDURE MUST BE FOLLOWED:
1) FIND "MEASURED SPAN" UPON ARCH UNIT'S DELIVERY TO SITE, PRIOR TO LIFTING FROM TRUCK AND REMOVING CABLE TIES/TIE RODS. "MEASURED SPAN" SHALL BE THE AVERAGE OF (3) SPAN MEASUREMENTS ALONG THE LAY LENGTH OF THE ARCH UNIT.
2) AFTER SETTING OF BRIDGE UNIT ON THE FOUNDATION, VERIFY THE SPAN. THIS "INSTALLED SPAN MEASUREMENT" SHALL NOT EXCEED THE MAXIMUM OF:
A) THE NOMINAL SPAN +½" OR
B) THE "MEASURED SPAN"
IF THE "INSTALLED SPAN MEASUREMENT" EXCEEDS THIS AMOUNT, THE ARCH UNIT SHALL BE LIFTED AND RE-SET UNTIL THE "INSTALLED SPAN MEASUREMENT" MEETS THE LIMITS.

13.5. PLACEMENT OF WINGWALLS, HEADWALLS AND FOUNDATION UNITS - THE WINGWALLS, HEADWALLS AND FOUNDATIONS SHALL BE PLACED AS SHOWN ON THE PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE.

13.6. JOINT PROTECTION AND SUBSURFACE DRAINAGE

13.6.1. EXTERNAL PROTECTION OF JOINTS - THE BUTT JOINT MADE BY TWO ADJOINING BRIDGE UNITS SHALL BE COVERED WITH A ⅞" x 1⅜" PREFORMED BITUMINOUS JOINT SEALANT AND A MINIMUM OF A 9" WIDE JOINT WRAP. THE SURFACE SHALL BE FREE OF DIRT BEFORE APPLYING THE JOINT MATERIAL. A PRIMER COMPATIBLE WITH THE JOINT WRAP TO BE USED SHALL BE APPLIED FOR A MINIMUM WIDTH OF 9" ON EACH SIDE OF THE JOINT. THE EXTERNAL WRAP SHALL BE CS212 BY CONCRETE SEALANTS INC., EZ-WRAP RUBBER BY PRESS-SEAL GASKET 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 TOP OF THE BRIDGE AND TO THE OPPOSITE BRIDGE SECTION LEG. ANY LAPS THAT RESULT IN THE JOINT WRAP SHALL BE A MINIMUM OF 6" LONG WITH THE OVERLAP RUNNING DOWNHILL.

13.6.2. 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 PRECAST WINGWALLS ARE USED, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE WINGWALL SHALL BE SEALED WITH A 2'-0" STRIP OF FILTER FABRIC. ALSO, IF LIFT HOLES ARE FORMED IN THE BRIDGE UNITS, THEY SHALL BE PRIMED AND COVERED WITH A 9" x 9" SQUARE OF JOINT WRAP.

13.6.3. DURING THE BACKFILLING OPERATION, CARE SHALL BE TAKEN TO KEEP THE JOINT WRAP IN ITS PROPER LOCATION OVER THE JOINT.

13.6.4. SUBSOIL DRAINAGE SHALL BE AS DIRECTED BY THE ENGINEER.

13.7. GROUTING

13.7.1. GROUTING SHALL NOT BE PERFORMED WHEN TEMPERATURES ARE EXPECTED TO GO BELOW 35° FOR A PERIOD OF 72 HOURS. GROUTING SHOULD BE COMPLETED AS SOON AS PRACTICAL AFTER PRECAST ARCHES HAVE BEEN INSTALLED. FILL THE BRIDGE-FOUNDATION KEYWAY WITH CEMENT GROUT (PORTLAND CEMENT AND WATER OR CEMENT MORTAR COMPOSED OF PORTLAND CEMENT, SAND AND WATER) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI. VIBRATE AS REQUIRED TO ENSURE THAT THE ENTIRE KEY AROUND THE BRIDGE ELEMENT IS COMPLETELY FILLED. IF BRIDGE ELEMENTS HAVE BEEN SET WITH TEMPORARY TIES (CABLES, BARS, ETC.) GROUT MUST ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI BEFORE TIES MAY BE REMOVED.

13.7.2. ALL GROUT SHALL HAVE A MAXIMUM AGGREGATE SIZE OF ¼".

13.7.3. LIFTING AND ERECTION ANCHOR RECESSES SHALL BE FILLED WITH GROUT.

13.7.4. AFTER GROUT HAS REACHED ITS DESIGN STRENGTH THE TEMPORARY HARDWOOD WEDGES SHALL BE REMOVED AND THEIR HOLES FILLED WITH GROUT.

13.8. BACKFILL

13.8.1. DO NOT PERFORM BACKFILLING DURING WET OR FREEZING WEATHER.

13.8.2. NO BACKFILL SHALL BE PLACED AGAINST ANY STRUCTURAL ELEMENTS UNTIL THEY HAVE BEEN APPROVED BY THE ENGINEER.

13.8.3. BACKFILL SHALL BE CONSIDERED AS ALL REPLACED EXCAVATION AND NEW EMBANKMENT ADJACENT TO THE PRECAST CONCRETE ELEMENTS. THE PROJECT CONSTRUCTION AND MATERIAL SPECIFICATIONS, WHICH INCLUDE THE SPECIFICATIONS FOR EXCAVATION FOR STRUCTURES AND ROADWAY EXCAVATION AND EMBANKMENT CONSTRUCTION, SHALL APPLY EXCEPT AS MODIFIED IN THIS SECTION.

13.8.4. BACKFILL ZONES:

- IN-SITU SOIL
- ZONE A: CONSTRUCTED EMBANKMENT OR OVERFILL.
- ZONE B: FILL THAT IS DIRECTLY ASSOCIATED WITH PRECAST CONCRETE BRIDGE INSTALLATION.
- ZONE C: ROAD STRUCTURE.

13.8.5. REQUIRED BACKFILL PROPERTIES

13.8.5.1. IN-SITU SOIL - NATURAL GROUND IS TO BE SUFFICIENTLY STABLE TO ALLOW EFFECTIVE SUPPORT TO THE PRECAST CONCRETE BRIDGE UNITS. AS A GUIDE, THE EXISTING NATURAL GROUND SHOULD BE OF SIMILAR QUALITY AND DENSITY TO ZONE B MATERIAL FOR MINIMUM LATERAL DIMENSION OF ONE BRIDGE SPAN OUTSIDE OF THE BRIDGE FOOTING.

13.8.5.2. ZONE A - ZONE A REQUIRES FILL MATERIAL WITH SPECIFICATIONS AND COMPACTING PROCEDURES EQUAL TO THAT FOR NORMAL ROAD EMBANKMENTS.

13.8.5.3. ZONE B - GENERALLY, SOILS SHALL BE REASONABLY FREE OF ORGANIC MATTER, AND, NEAR CONCRETE SURFACES, FREE OF STONES LARGER THAN 3" IN DIAMETER. SEE CHARTS FOR DETAILED DESCRIPTIONS OF ACCEPTABLE SOILS.

13.8.5.4. ZONE C - ZONE C IS THE ROAD SECTION OF GRAVEL, ASPHALT OR CONCRETE BUILT IN COMPLIANCE WITH LOCAL ENGINEERING PRACTICES.

13.8.5.5. GEOTECHNICAL ENGINEER SHALL REVIEW GRADATIONS OF ALL INTERFACING MATERIALS AND, IF NECESSARY, RECOMMEND GEOTEXTILE FILTER FABRIC (PROVIDED BY CONTRACTOR)

13.8.6. PLACING AND COMPACTING BACKFILL
DUMPING FOR BACKFILLING IS NOT ALLOWED ANY NEARER THAN 3'-0" FROM THE BRIDGE LEG.

THE FILL MUST BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE MAXIMUM DIFFERENCE IN THE SURFACE LEVELS OF THE FILL ON OPPOSITE SIDES OF THE BRIDGE MUST NOT EXCEED 2'-0".

THE FILL BEHIND WINGWALLS MUST BE PLACED AT THE SAME TIME AS THAT OF THE BRIDGE FILL. IT MUST BE PLACED IN PROGRESSIVELY PLACED HORIZONTAL LAYERS NOT EXCEEDING 8" PER LAYER.

THE BACKFILL OF ZONE B SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95% OF THE STANDARD PROCTOR, AS REQUIRED BY AASHTO T-99.

SOIL WITHIN 1'-0" OF CONCRETE SURFACES SHALL BE HAND-COMPACTED. ELSEWHERE, USE OF ROLLERS IS ACCEPTABLE. IF VIBRATING ROLLER-COMPACTORS ARE USED, THEY SHALL NOT BE STARTED OR STOPPED WITHIN ZONE B AND THE VIBRATION FREQUENCY SHOULD BE AT LEAST 30 REVOLUTIONS PER SECOND.

THE BACKFILL MATERIAL AND COMPACTING BEHIND WINGWALLS SHALL SATISFY THE CRITERIA FOR THE BRIDGE BACKFILL, ZONE B.

BACKFILL AGAINST A WATERPROOFED SURFACE SHALL BE PLACED CAREFULLY TO AVOID DAMAGE TO THE WATERPROOFING MATERIAL.

13.8.7. BRIDGE UNITS
FOR FILL HEIGHTS OVER 12 FEET (AS MEASURED FROM TOP CROWN OF BRIDGE TO FINISHED GRADE), NO BACKFILLING MAY BEGIN UNTIL A BACKFILL COMPACTION TESTING PLAN HAS BEEN COORDINATED WITH AND APPROVED BY CONTECH® ENGINEERED SOLUTIONS.

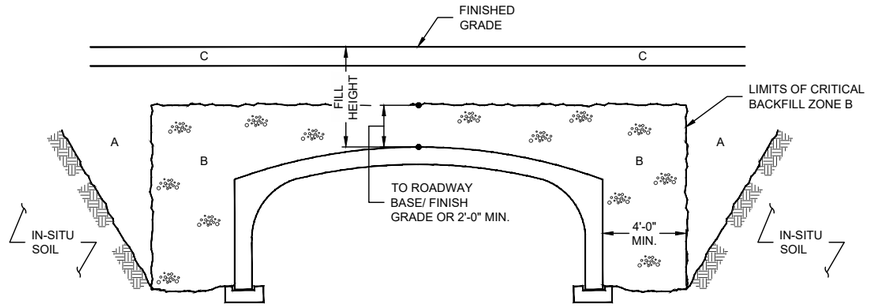
13.8.8. WINGWALLS
BACKFILL IN FRONT OF WINGWALLS SHALL BE CARRIED TO GROUND LINES SHOWN IN THE PLANS.

13.8.9. MONITORING
THE CONTRACTOR SHALL CHECK SETTLEMENTS AND HORIZONTAL DISPLACEMENT OF FOUNDATION TO ENSURE THAT THEY ARE WITHIN THE ALLOWABLE LIMIT PROVIDED BY THE ENGINEER. THESE MEASUREMENTS SHOULD GIVE AN INDICATION OF THE SETTLEMENTS AND DEFORMATIONS ALONG THE LENGTH OF THE FOUNDATIONS.

THE FIRST MEASUREMENT SHOULD TAKE PLACE AFTER THE ERECTION OF ALL PRECAST BRIDGE SYSTEM ELEMENTS, A SECOND AFTER COMPLETION OF BACKFILLING, AND A THIRD BEFORE OPENING OF THE BRIDGE TO TRAFFIC. FURTHER MEASUREMENTS MAY BE MADE ACCORDING TO LOCAL CONDITIONS.

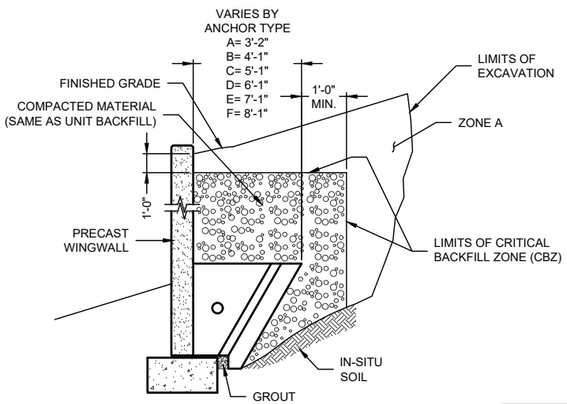
ACCEPTABLE SOILS FOR USE IN ZONE B BACKFILL

TYPICAL USCS MATERIALS	AASHTO GROUP	AASHTO SUBGROUP	PERCENT PASSING US SIEVE NO.			CHARACTER OF FRACTION PASSING NO. 40 SIEVE		SOIL DESRIPTION
			#10	#40	#200	LIQUID LIMIT	PLASTICITY INDEX	
GW, GP, SP	A1	A-1a	50 MAX	30 MAX	15 MAX		6 MAX	LARGELY GRAVEL BUT CAN INCLUDE SAND AND FINES
GM, SW, SP, SM		A-1b		50 MAX	25 MAX		6 MAX	GRAVELLY SAND OR GRADED SAND, MAY INCLUDE FINES
GM, SM, ML, SP, GP	A2	A-2-4			35 MAX	40 MAX	10 MAX	SANDS, GRAVELS WITH LOW-PLASTICITY SILT FINES
SC, GC, GM		A-2-5			35 MAX	41 MIN	10 MAX	SANDS, GRAVELS WITH PLASTIC SILT FINES
SP, SM, SW	A3			51 MIN	10 MAX		NON-PLASTIC	FINE SANDS
ML, SM, SC	A4				36 MIN	40 MAX	10 MAX	LOW-COMPRESSIBILTY SILTS

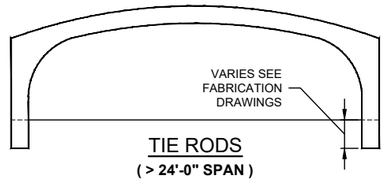


SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE ZONE B
≤ 24'-0"	≥ 12'-0"	A1, A3
≤ 24'-0"	< 12'-0"	A1, A2, A3, A4
> 24'-0"	ALL	A1, A3

BACKFILL REQUIREMENTS



WALL BACKFILL REQUIREMENTS



TIE RODS
(> 24'-0" SPAN)

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ADDENDUM NO. 1

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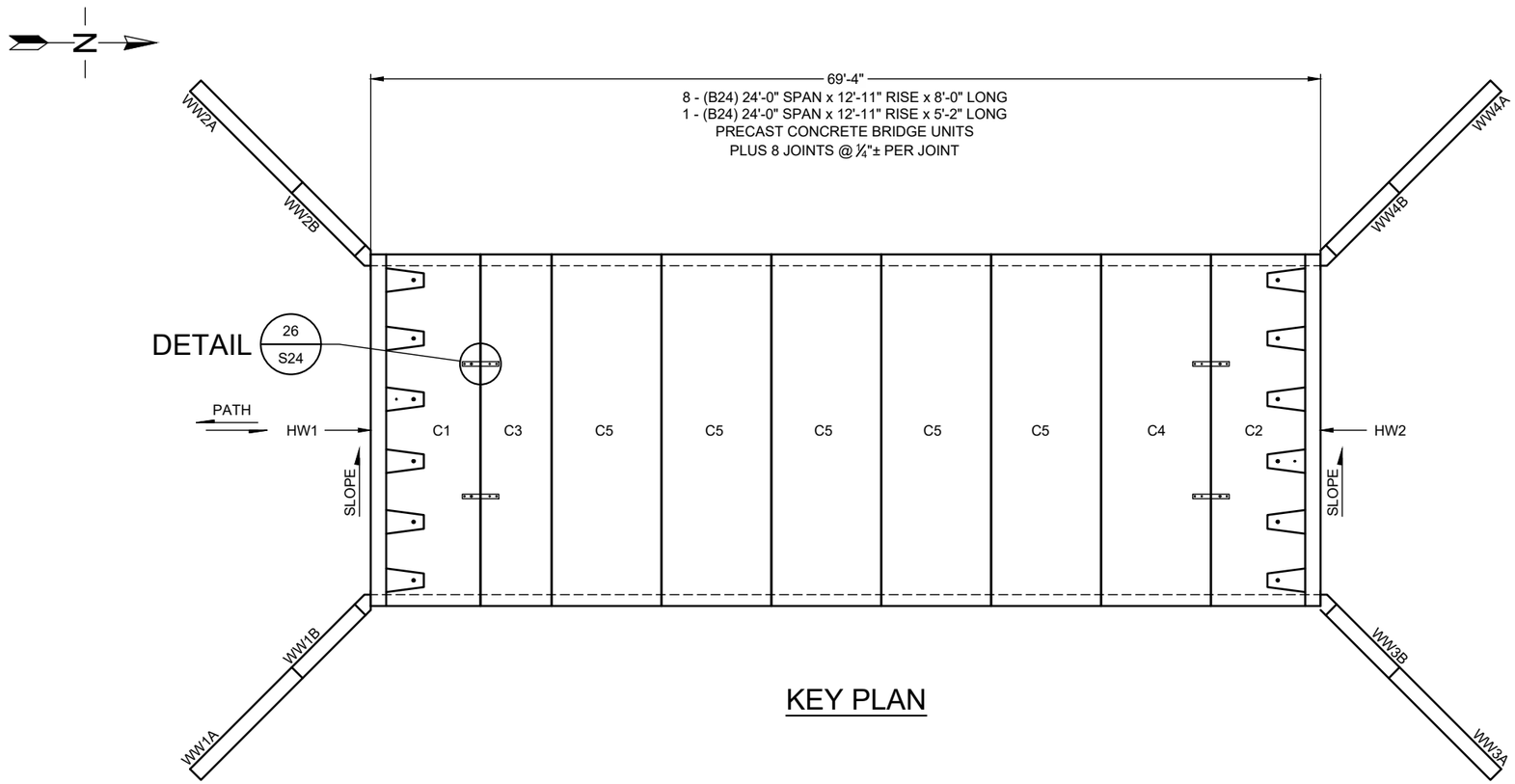

KEY PLAN

Reviewed by:
Great Lakes Engineering Group, LLC.
APPROVED
By: M. Lessens @ 8:10 am
on 12/15/25
GREAT LAKES ENGINEERING GROUP, LLC

APPROVED

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CONSPAN BRIDGE SYSTEMS

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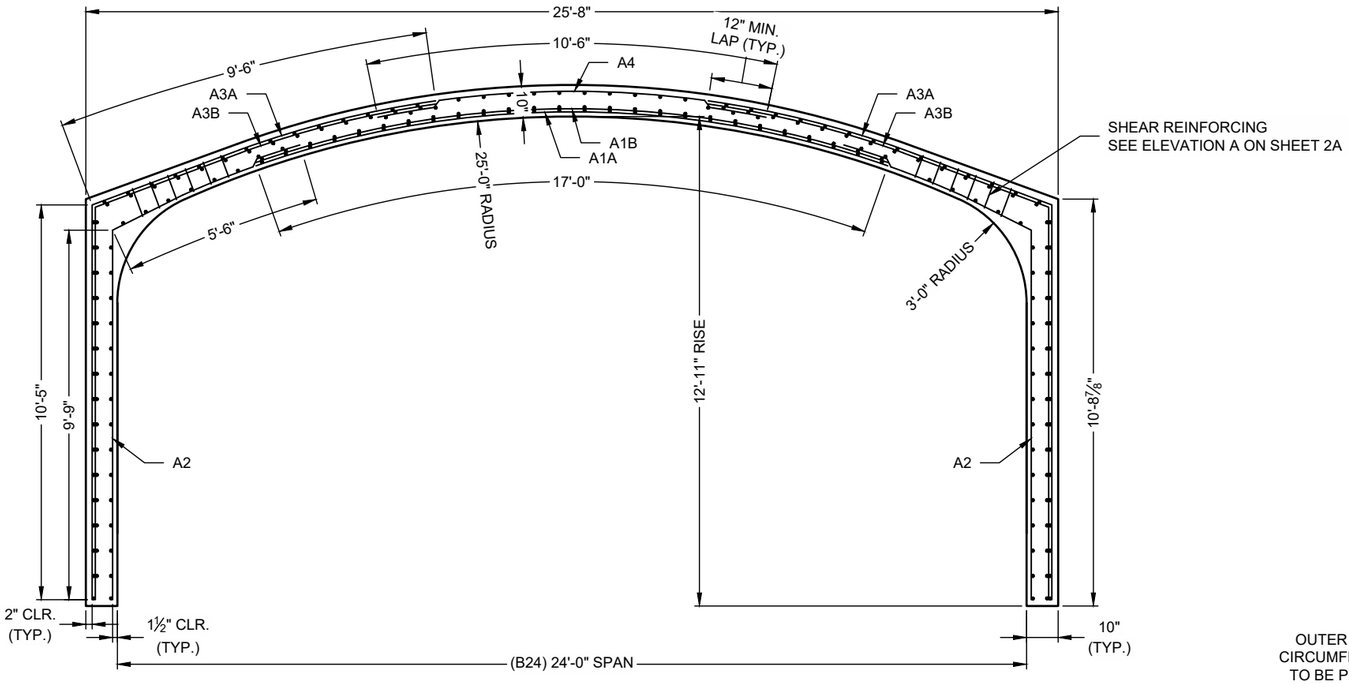
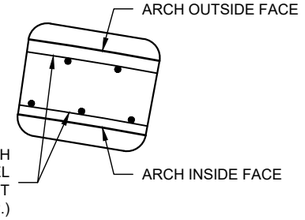
ADDENDUM NO. 1

NOTES:
1. MINIMUM 28-DAY CONCRETE COMPRESSIVE STRENGTH SHALL BE 5000 PSI.
2. OVERLAP LENGTH SHALL BE MEASURED FROM LAST CROSSWIRE.
3. DIMENSIONS SHOWN ARE FOR FORM SYSTEM "B24".
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 ¾" 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.
8. SPACING OF A2 & A4 CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2" MIN. TO 4" MAX. SPACING OF A1 & A3 CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2".



PRECAST UNIT REINFORCEMENT



TYPICAL MESH PLACEMENT DETAIL

WEIGHT OF REQUIRED REINFORCEMENT = 437.3 LBS/FT

SHEET NO	CIRCUMFERENTIAL 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	A1A = 0.96	0.19		17'-0"		
2	A1B = 0.84	0.19		17'-0"		
3	A2 = 0.48	0.13		15'-3"		
4	A3A = 0.96	0.13		19'-11"		
5	A3B = 0.48	0.13		19'-11"		
6	A4 = 0.36	0.13		10'-6"		
7						

DESIGN LOADING: MDOT HL-93 COVER = 1'-9" MIN. \ 2'-3" MAX.

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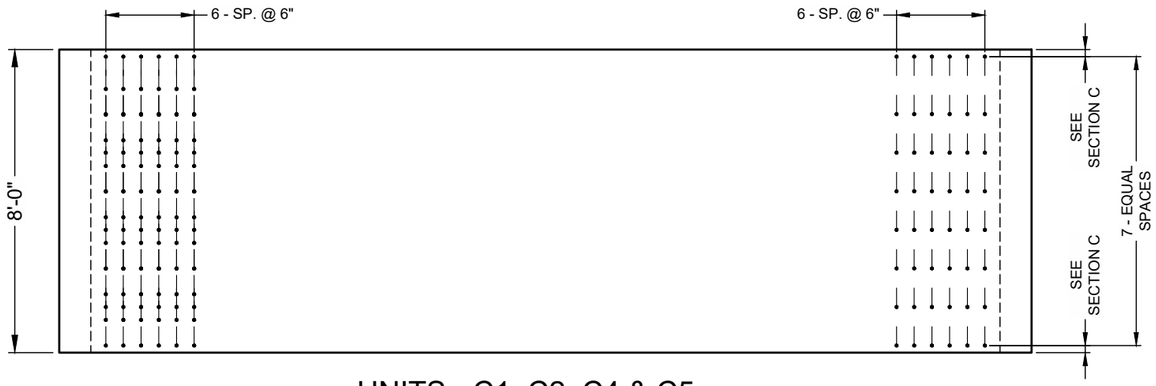
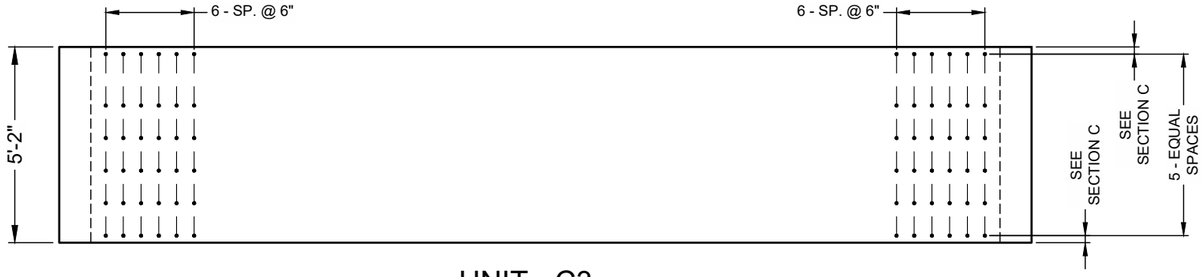
ADDENDUM NO. 1

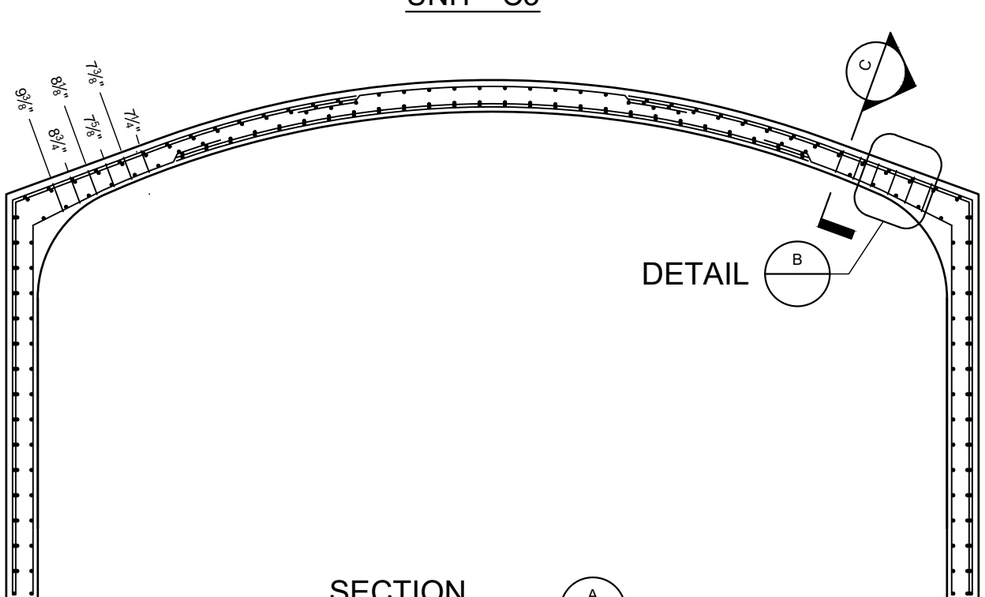
NOTE:
REINFORCING STEEL FOR SHEAR REINFORCEMENT SHALL CONFORM TO ASTM 615, A616 OR A617-GRADE 60.



UNITS - C1, C2, C4 & C5

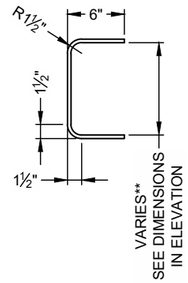


UNIT - C3



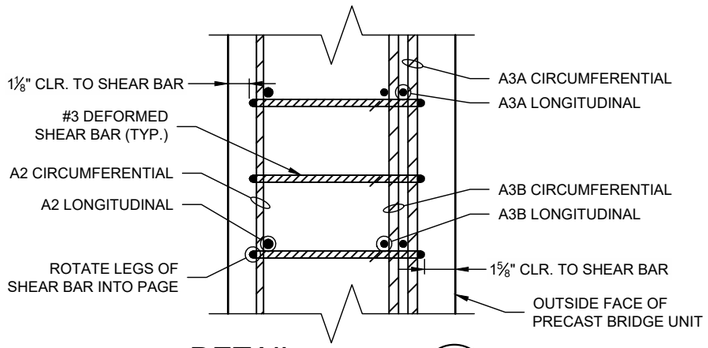
DETAIL B

SECTION A

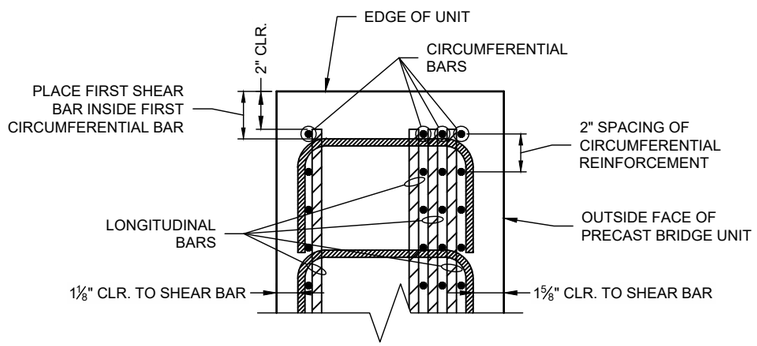


**VARIES AS REQUIRED TO PROVIDE 2" CLR. FOR CIRCUMFERENTIAL STEEL

#3 DEFORMED BAR



DETAIL B



SECTION C

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

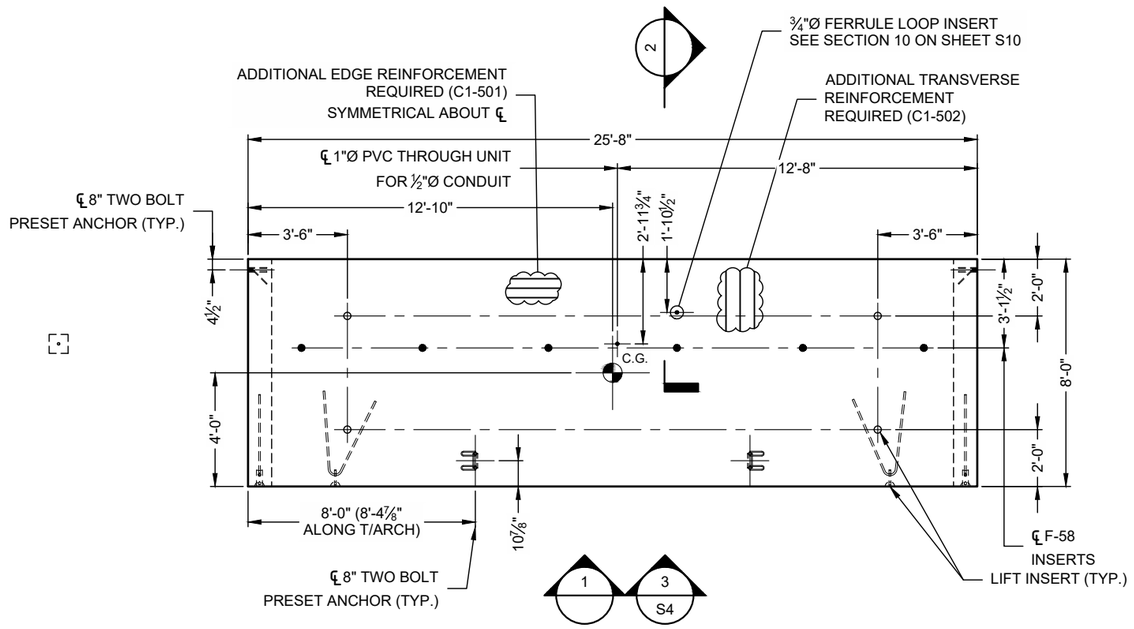
CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

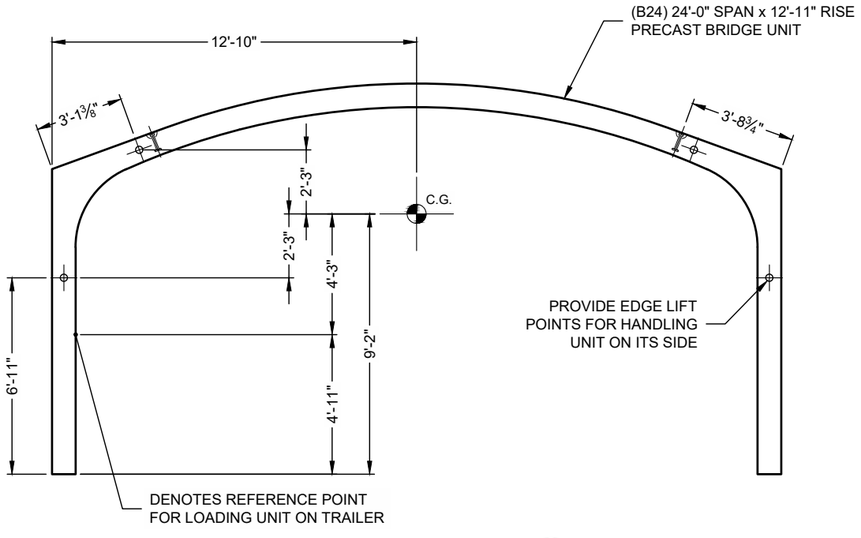
LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S2A OF S26		



PLAN - C1

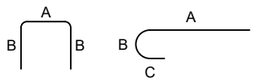
TOTAL WEIGHT = 24.4 TONS



ELEVATION

C.G. & LIFT POINTS

1



TYPE 2

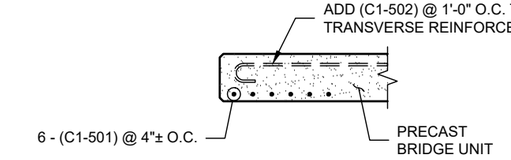
TYPE 3

~~ADDENDUM NO. 1~~

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- SEE SHEET S2 FOR BRIDGE UNIT DIMENSIONS

REINFORCING CAST IN BRIDGE UNIT - C1

MARK	SIZE	QTY.	LENGTH	TYPE	A	B	C
C1-301	3	16	1'-7¼"	2	7¼"	6"	
C1-302	3	16	1'-7⅜"	2	7⅜"	6"	
C1-303	3	16	1'-7⅝"	2	7⅝"	6"	
C1-304	3	16	1'-8⅛"	2	8⅛"	6"	
C1-305	3	16	1'-8¾"	2	8¾"	6"	
C1-306	3	16	1'-9⅜"	2	9⅜"	6"	
C1-501	5	6	17'-0"	BENT			
C1-502	5	28	8'-4"	3	7'-6"	5"	5"



SECTION

ADDITIONAL REBAR ONLY

2

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

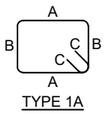
CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR		DRAWN: PJW
CHECKED: EA		APPROVED: PAC
SHEET NO.: S3 OF S26		

ADDENDUM NO. 1

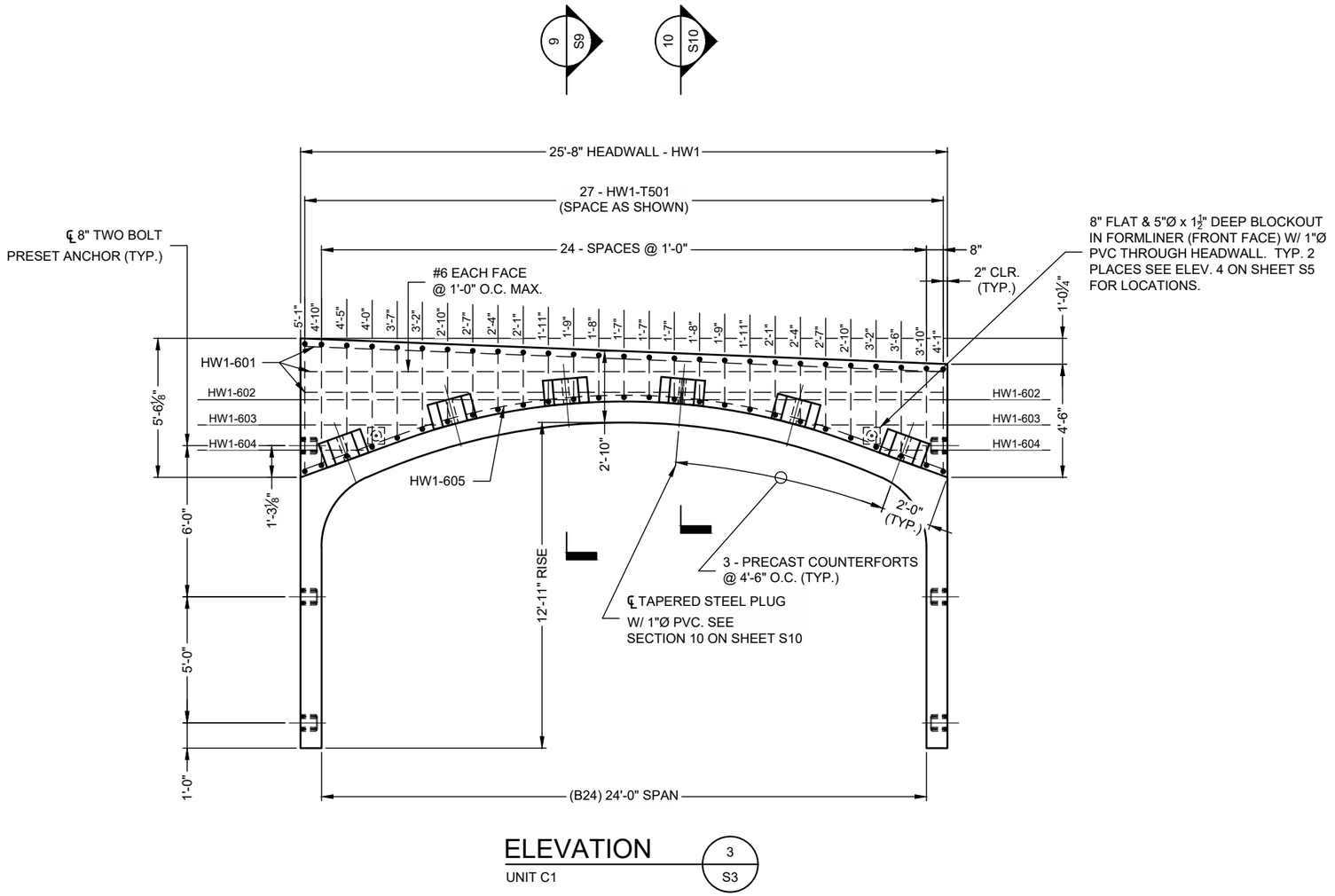


TYPE 1A

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF HEADWALL
- SEE SHEET S3 FOR BRIDGE UNIT C.G. & LIFT POINTS
- SEE SHEET S5 FOR HEADWALL C.G. & LIFT POINTS
- HEADWALL TO BE CAST AGAINST BRIDGE UNIT
- BRIDGE UNITS MUST BE GROUTED OR BRACED WHEN SETTING PRECAST HEADWALLS
- SEE SHEET S2 FOR BRIDGE UNIT DIMENSIONS

HEADWALL		ARCH UNIT		
CONCRETE	REINF. STEEL	CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	28-DAY: 5000 PSI	60,000 PSI UNCOATED	65,000 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 — UNIT C1 — 3 / S3

REINFORCING CAST IN HEADWALL - HW1

MARK	SIZE	QTY.	LENGTH	TYPE	A	B	C
HW1-T501	5	27	VARIES	1A	8"	VARIES	6"
HW1-601	6	6	25'-4"	STR.			
HW1-602	6	4	10'-5"	STR.			
HW1-603	6	4	5'-2"	STR.			
HW1-604	6	4	2'-4"	STR.			
HW1-605	6	2	26'-2"	BENT			

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

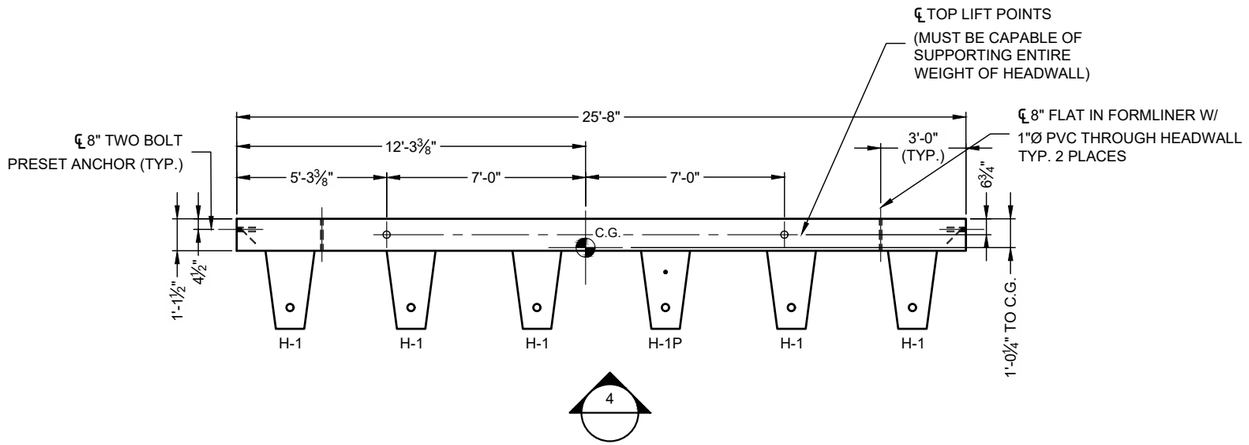
FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S4 OF S26		

~~ADDENDUM NO. 1~~

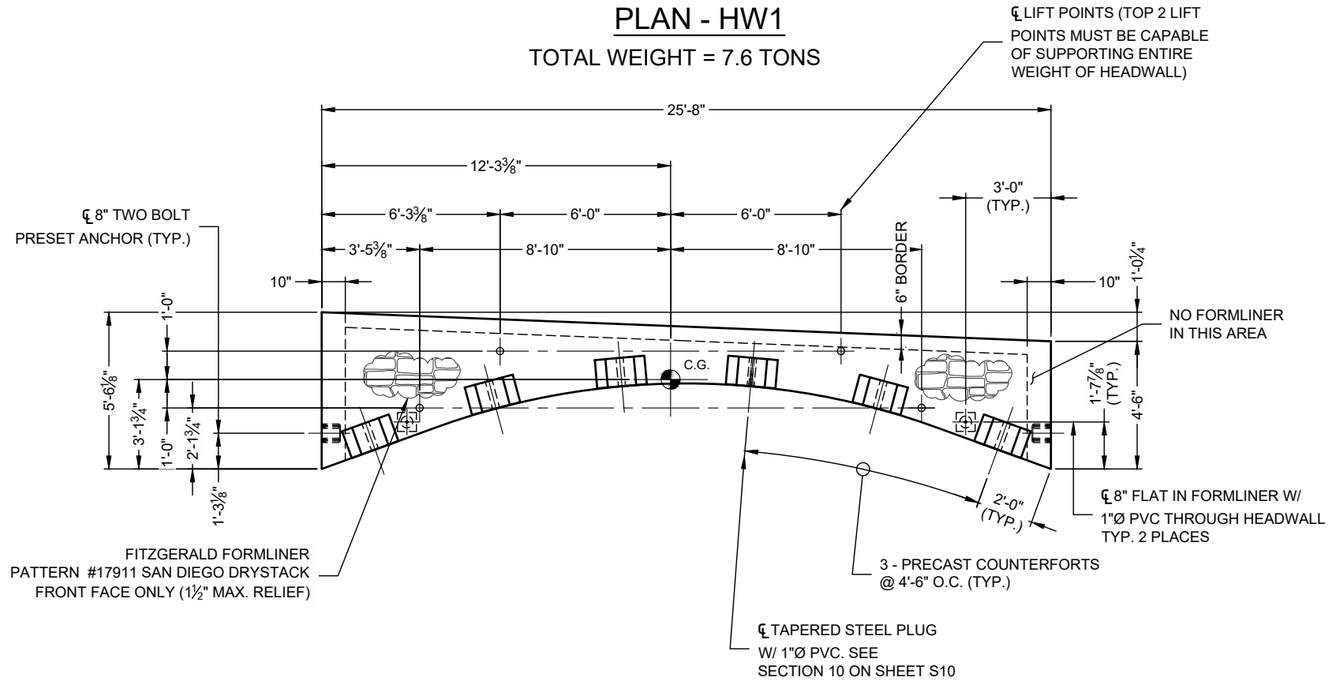
NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF HEADWALL
- HEADWALL TO BE CAST AGAINST BRIDGE UNIT
- BRIDGE UNITS MUST BE GROUTED OR BRACED WHEN SETTING PRECAST HEADWALLS
- HEADWALL WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED
- SEE SHEET S9 FOR H-1 COUNTERFORT DETAILS
- SEE SHEET S10 FOR H-1P COUNTERFORT DETAILS



4

PLAN - HW1

TOTAL WEIGHT = 7.6 TONS



ELEVATION 4

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

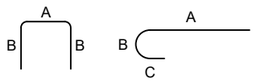
FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S5 OF S26		

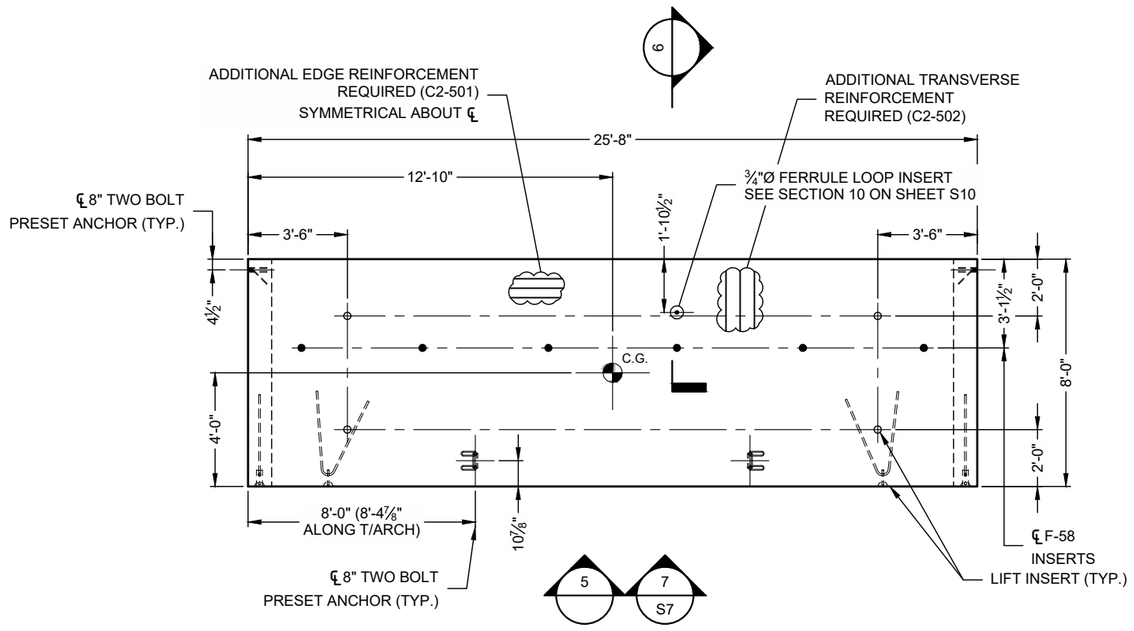
ADDENDUM NO. 1

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- SEE SHEET S2 FOR BRIDGE UNIT DIMENSIONS



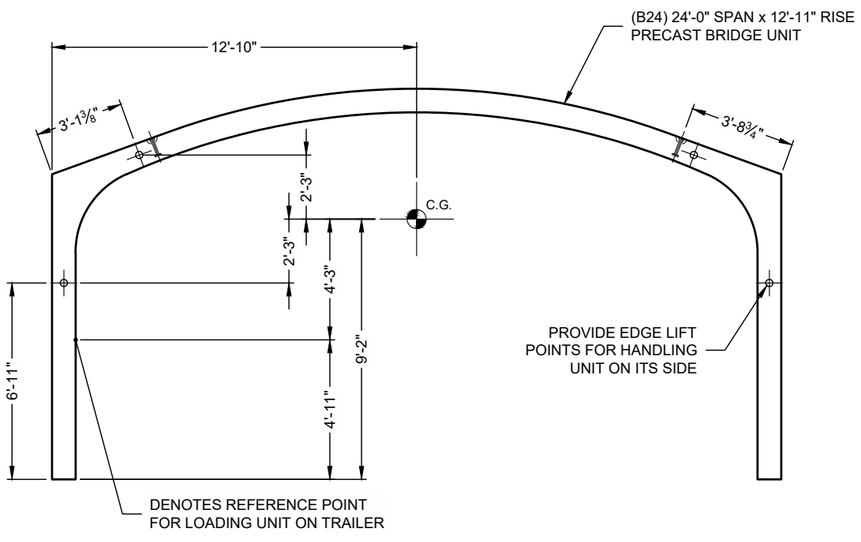
REINFORCING CAST IN BRIDGE UNIT - C2

MARK	SIZE	QTY.	LENGTH	TYPE	A	B	C
C2-301	3	16	1'-7¼"	2	7¼"	6"	
C2-302	3	16	1'-7⅜"	2	7⅜"	6"	
C2-303	3	16	1'-7⅝"	2	7⅝"	6"	
C2-304	3	16	1'-8⅛"	2	8⅛"	6"	
C2-305	3	16	1'-8¾"	2	8¾"	6"	
C2-306	3	16	1'-9⅜"	2	9⅜"	6"	
C2-501	5	6	17'-0"	BENT			
C2-502	5	28	8'-4"	3	7'-6"	5"	5"



PLAN - C2

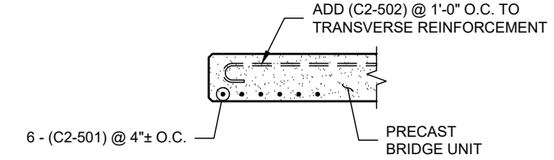
TOTAL WEIGHT = 24.4 TONS



ELEVATION

C.G. & LIFT POINTS

5



SECTION

ADDITIONAL REBAR ONLY

6

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

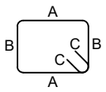
CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S6 OF S26		

~~ADDENDUM~~ NO. 1

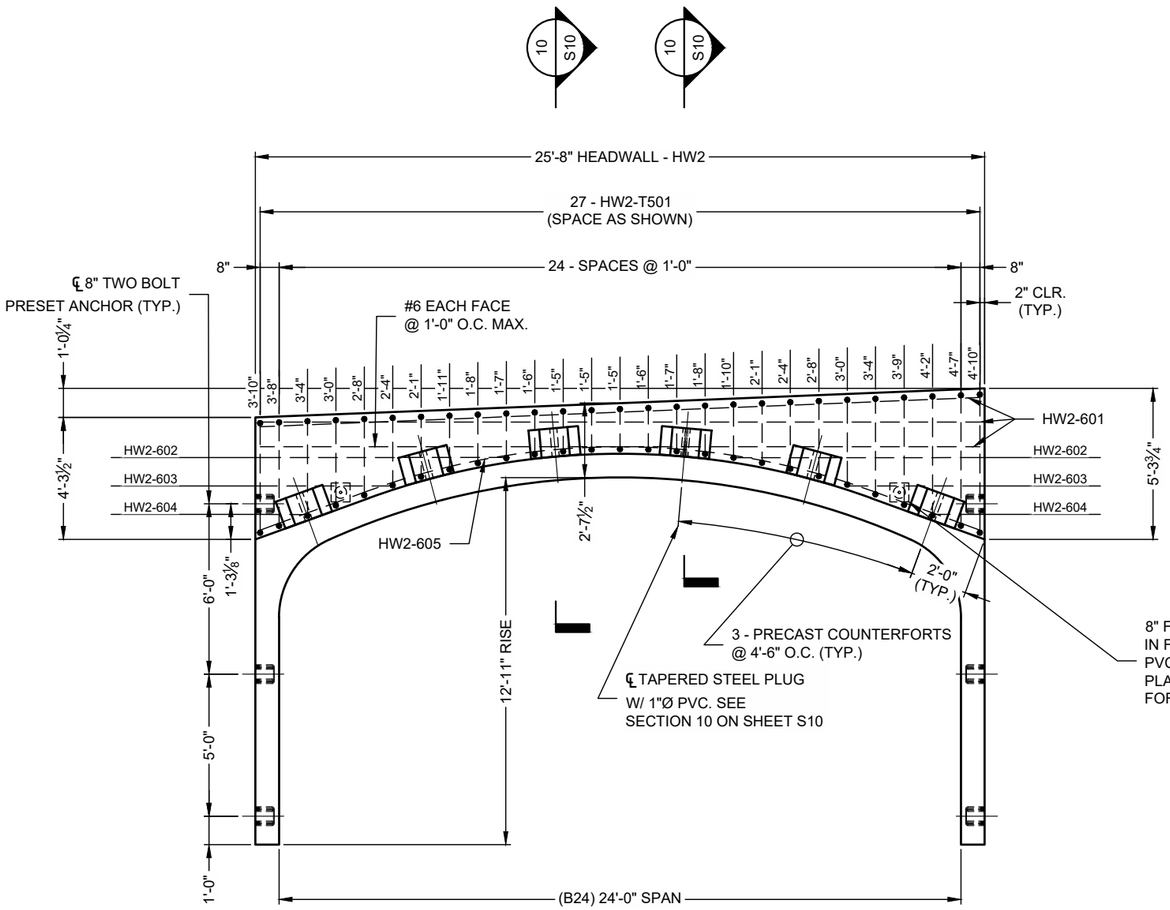


TYPE 1A

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF HEADWALL
- SEE SHEET S6 FOR BRIDGE UNIT C.G. & LIFT POINTS
- SEE SHEET S8 FOR HEADWALL C.G. & LIFT POINTS
- HEADWALL TO BE CAST AGAINST BRIDGE UNIT
- BRIDGE UNITS MUST BE GROUTED OR BRACED WHEN SETTING PRECAST HEADWALLS
- SEE SHEET S2 FOR BRIDGE UNIT DIMENSIONS

HEADWALL		ARCH UNIT		
CONCRETE	REINF. STEEL	CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	28-DAY: 5000 PSI	60,000 PSI UNCOATED	65,000 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 7 / S6
UNIT C2

REINFORCING CAST IN HEADWALL - HW2

MARK	SIZE	QTY.	LENGTH	TYPE	A	B	C
HW2-T501	5	27	VARIES	1A	8"	VARIES	6"
HW2-601	6	6	25'-4"	STR.			
HW2-602	6	4	8'-9"	STR.			
HW2-603	6	4	4'-7"	STR.			
HW2-604	6	4	1'-9"	STR.			
HW2-605	6	2	26'-2"	BENT			

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

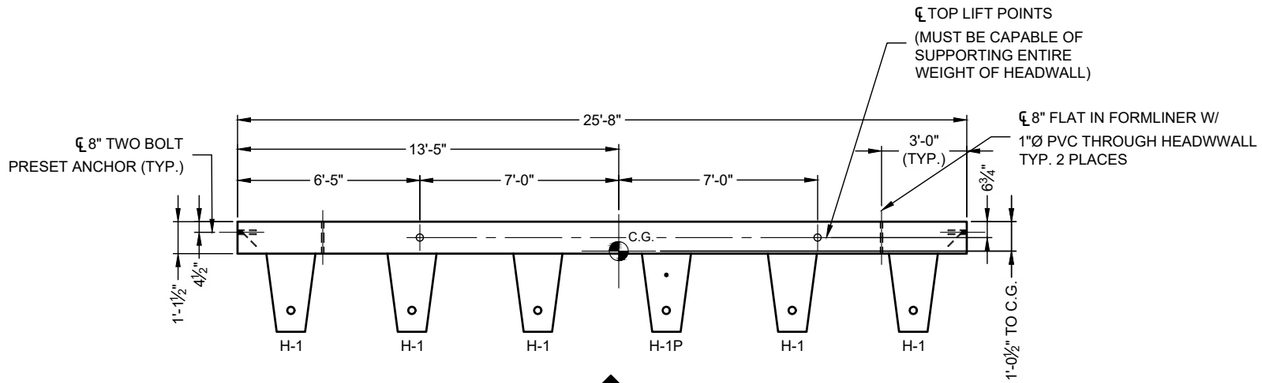
CONSPAN BRIDGE SYSTEMS
FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S7 OF S26		

~~ADDENDUM NO. 1~~

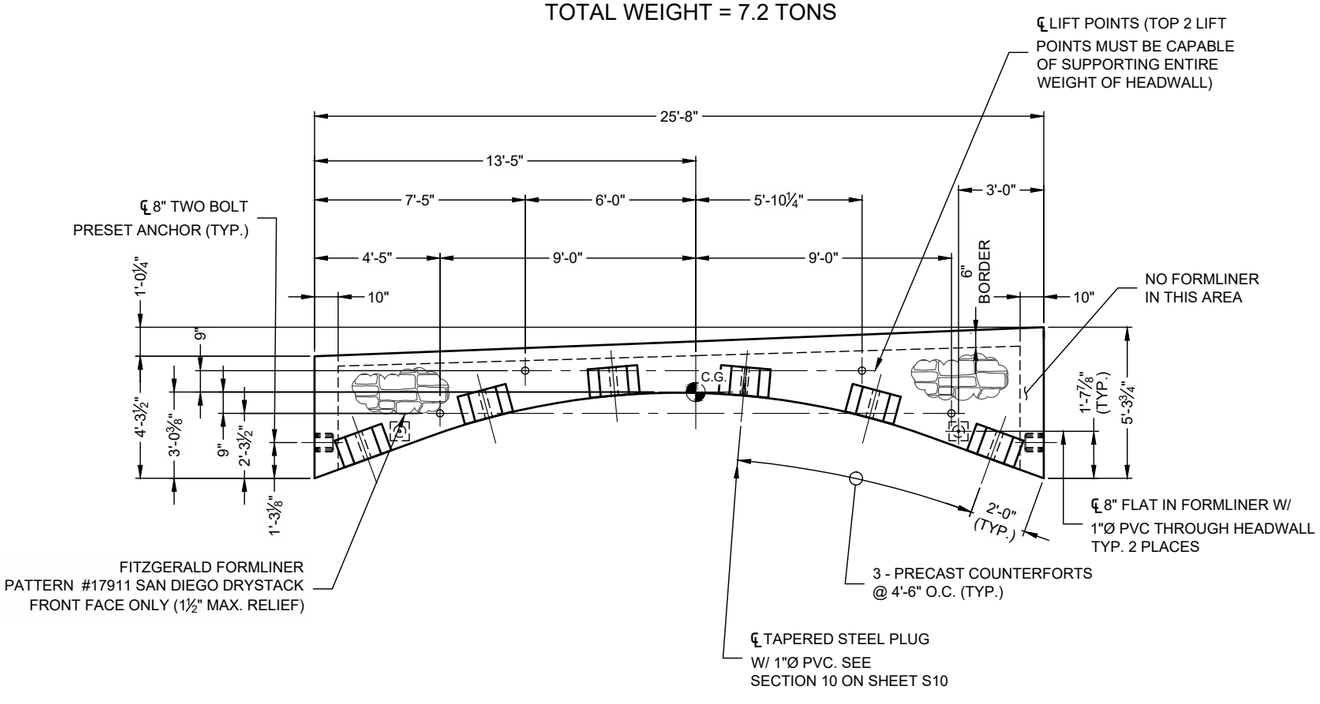
NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF HEADWALL
- HEADWALL TO BE CAST AGAINST BRIDGE UNIT
- BRIDGE UNITS MUST BE GROUTED OR BRACED WHEN SETTING PRECAST HEADWALLS
- HEADWALL WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED
- SEE SHEET S9 FOR H-1 COUNTERFORT DETAILS
- SEE SHEET S10 FOR H-1P COUNTERFORT DETAILS



8

PLAN - HW2

TOTAL WEIGHT = 7.2 TONS



ELEVATION

8

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

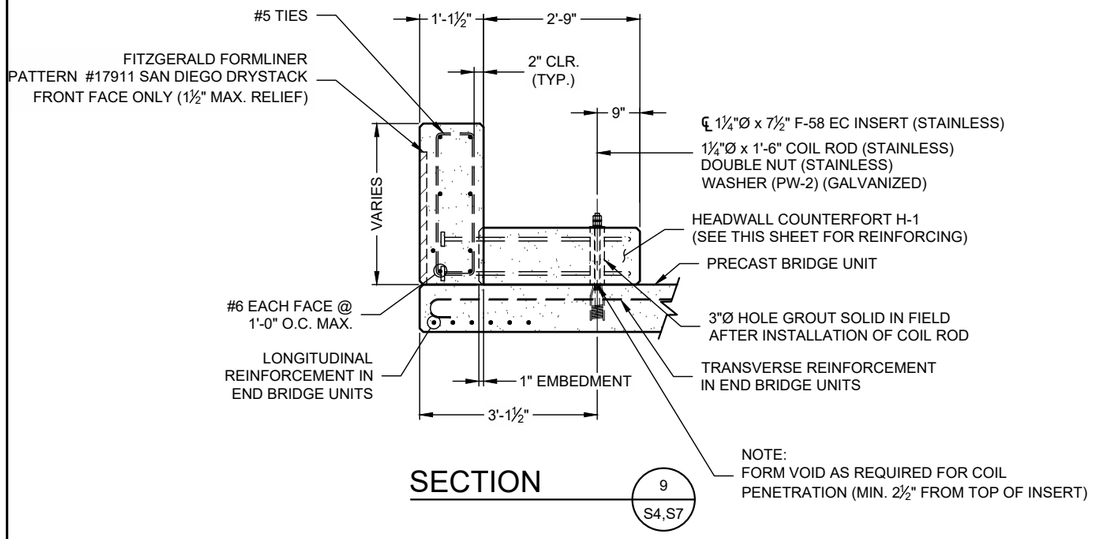
LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S8 OF S26		

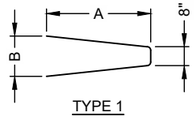
COUNTERFORT H-1

ADDENDUM NO. 1

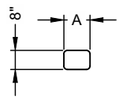
EC INSERT = F-58
TOTAL REQUIRED = 10



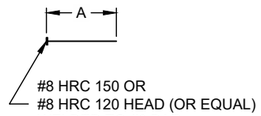
SECTION 9 / S4,S7



TYPE 1



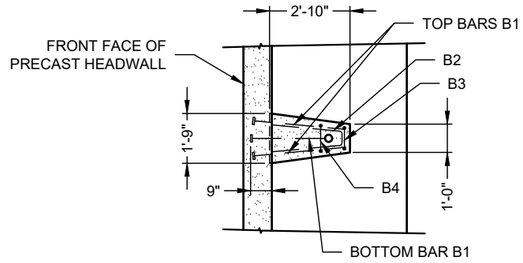
TYPE 2



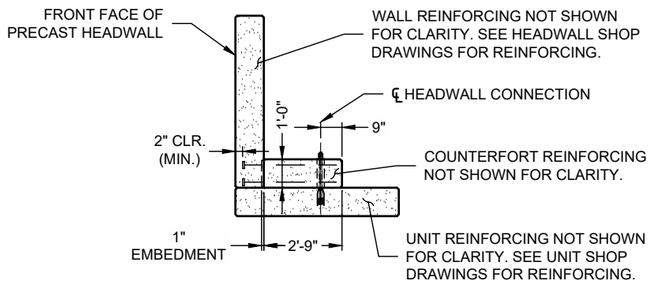
TYPE 3
(EPOXY COATED*)

*NOTE: EPOXY COATING IS NOT REQUIRED ON HEADED ENDS OF TYPE 3 BARS, BUT WILL NOT BE DETRIMENTAL IF PROVIDED.

*NOTE: HRC HEADS PROVIDED BY HEADED REINFORCEMENT CORP.



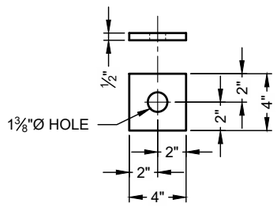
PLAN - TYPE H-1



SECTION - TYPE H-1

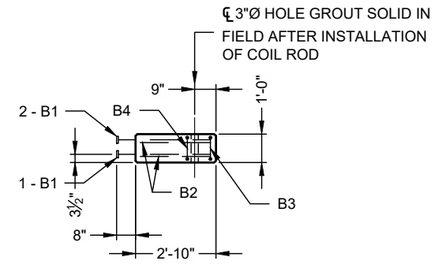
BAR LIST - TYPE H-1							
MARK	QTY.	SIZE	A	B	TYPE	LENGTH	FINISH
B1	3	#6	3'-0"	-	3	3'-0"	EPOXY*
B2	2	#5	2'-6"	1'-5"	1	5'-8"	BLACK
B3	1	#3	8"	-	2	2'-8"	BLACK
B4	1	#3	11"	-	2	3'-2"	BLACK

STANDARD CLEARANCE = 2"



PW-2

(℄ WASHER, ½" x 4" x 4")
(GALVANIZED AS PER ASTM A123)



PRECAST COUNTERFORT
TYPE H-1

TOTAL WEIGHT = .284 TONS

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

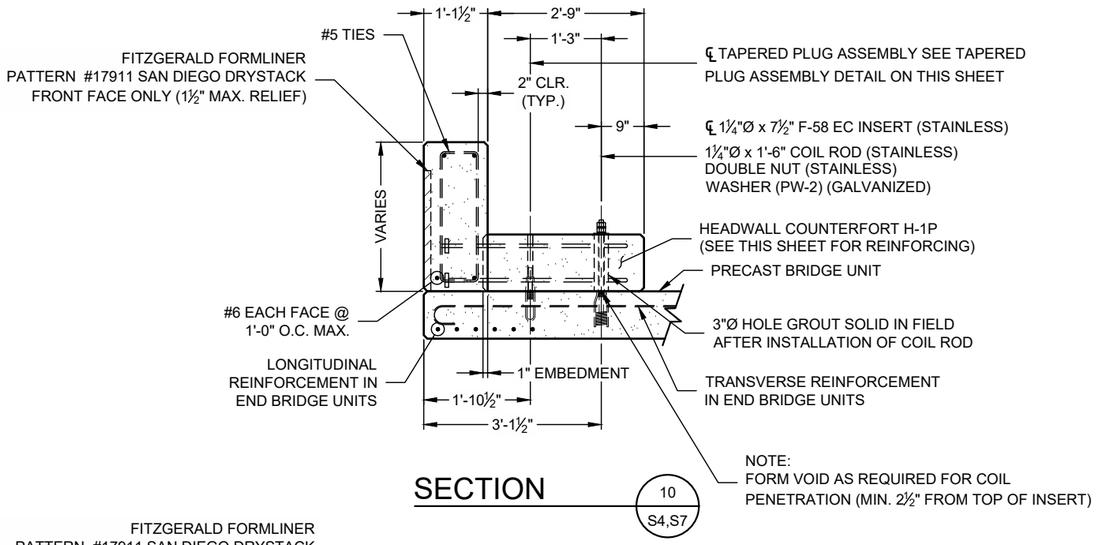
CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

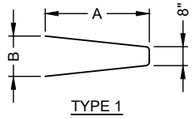
PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S9 OF S26		

I:\MERLIN\PROJECT\ACTIVE\781600\781640\781640-10-CON_SPAN\DRAWINGS\FABRICATION\APP-781640-010-CB-FAB-D.DWG 12/10/2025 8:22 AM

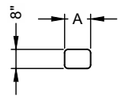


SECTION

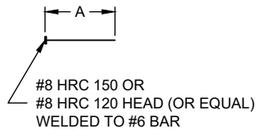
10
S4,S7



TYPE 1



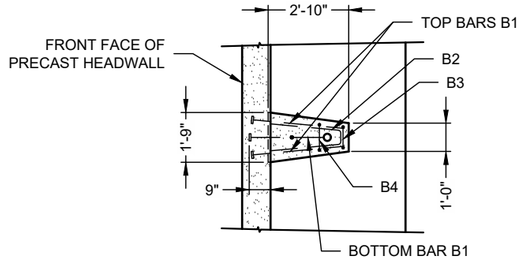
TYPE 2



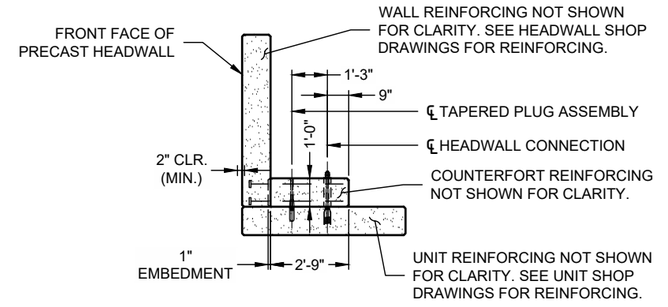
TYPE 3
(EPOXY COATED*)

*NOTE: EPOXY COATING IS NOT REQUIRED ON HEADED ENDS OF TYPE 3 BARS, BUT WILL NOT BE DETRIMENTAL IF PROVIDED.

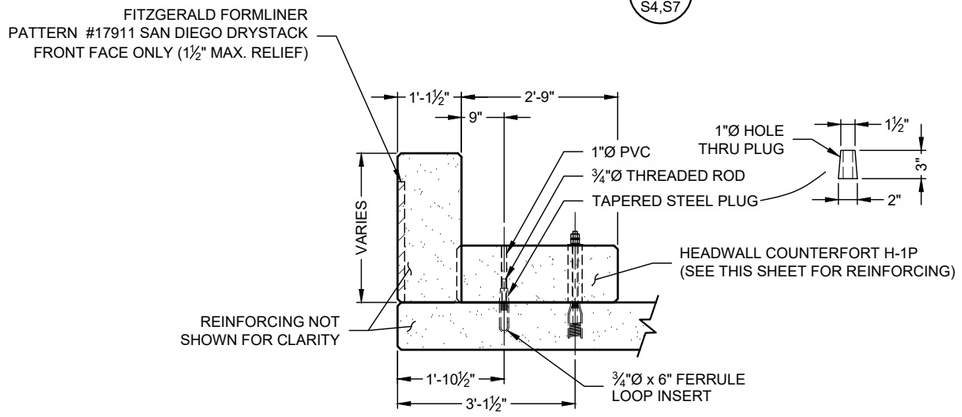
*NOTE: HRC HEADS PROVIDED BY HEADED REINFORCEMENT CORP.



PLAN - TYPE H-1P



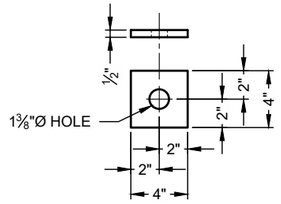
SECTION - TYPE H-1P



TAPERED PLUG ASSEMBLY DETAIL

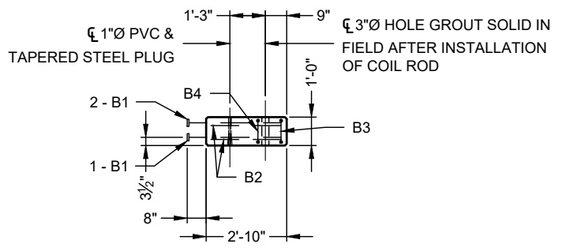
BAR LIST - TYPE H-1P							
MARK	QTY.	SIZE	A	B	TYPE	LENGTH	FINISH
B1	3	#6	3'-0"	-	3	3'-0"	EPOXY*
B2	2	#5	2'-6"	1'-5"	1	5'-8"	BLACK
B3	1	#3	8"	-	2	2'-8"	BLACK
B4	1	#3	11"	-	2	3'-2"	BLACK

STANDARD CLEARANCE = 2"



PW-2

(℄ WASHER, ½" x 4" x 4")
(GALVANIZED AS PER ASTM A123)



PRECAST COUNTERFORT TYPE H-1P

TOTAL WEIGHT = .284 TONS

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

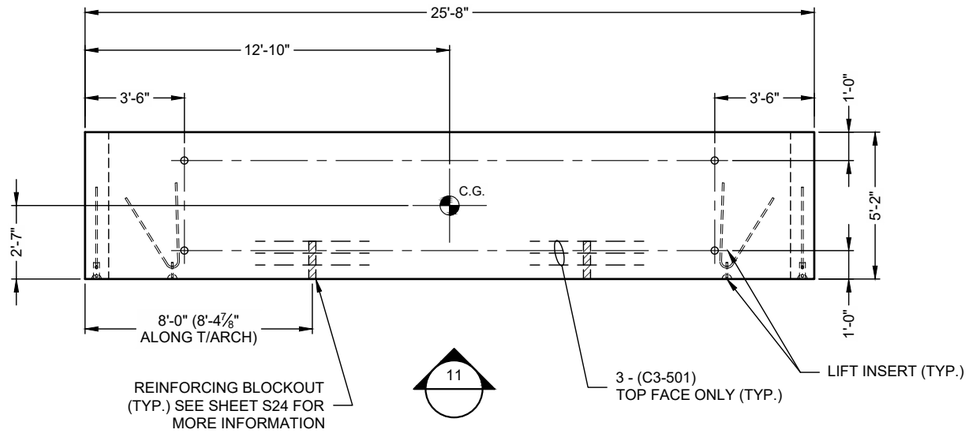
CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

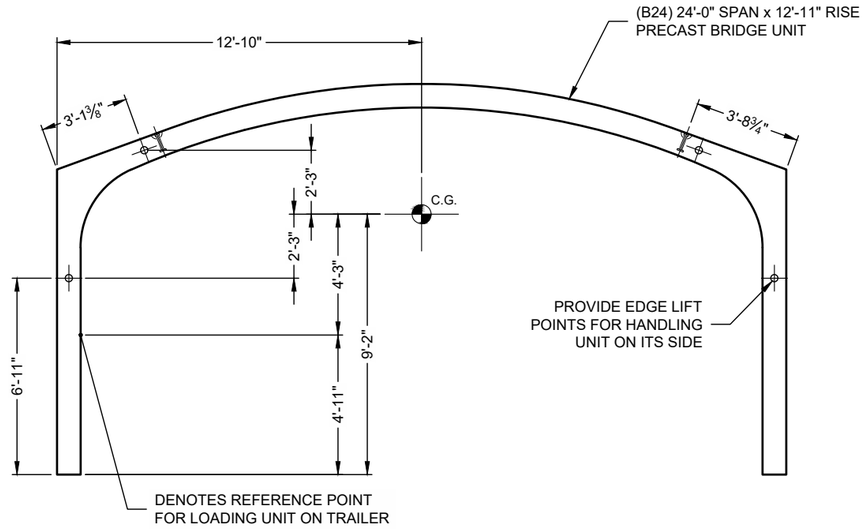
PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S10 OF S26		

ADDENDUM NO. 1



PLAN - C3 - 1 REQUIRED

TOTAL WEIGHT = 15.8 TONS



ELEVATION

11

TYPE 2

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- SEE SHEET S2 FOR BRIDGE UNIT DIMENSIONS
- MANUFACTURER SHALL MARK END OF UNIT C3 WITH REINFORCING BLOCKOUT PRIOR TO SHIPPING.

ARCH UNIT		
CONCRETE	REINF. STEEL	WWF
28-DAY: 5000 PSI	60,000 PSI UNCOATED	65,000 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.

REINFORCING CAST IN BRIDGE UNIT - C3

MARK	SIZE	QTY.	LENGTH	TYPE	A	B	C
C3-301	3	12	1'-7¼"	2	7¼"	6"	
C3-302	3	12	1'-7⅜"	2	7⅜"	6"	
C3-303	3	12	1'-7⅝"	2	7⅝"	6"	
C3-304	3	12	1'-8⅛"	2	8⅛"	6"	
C3-305	3	12	1'-8¾"	2	8¾"	6"	
C3-306	3	12	1'-9⅜"	2	9⅜"	6"	
C3-501	5	6	4'-0"	STR.			

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

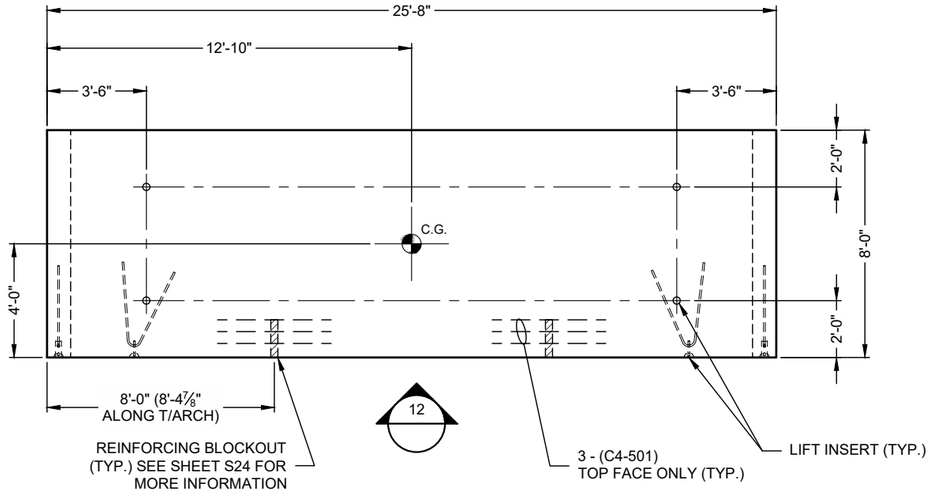
CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

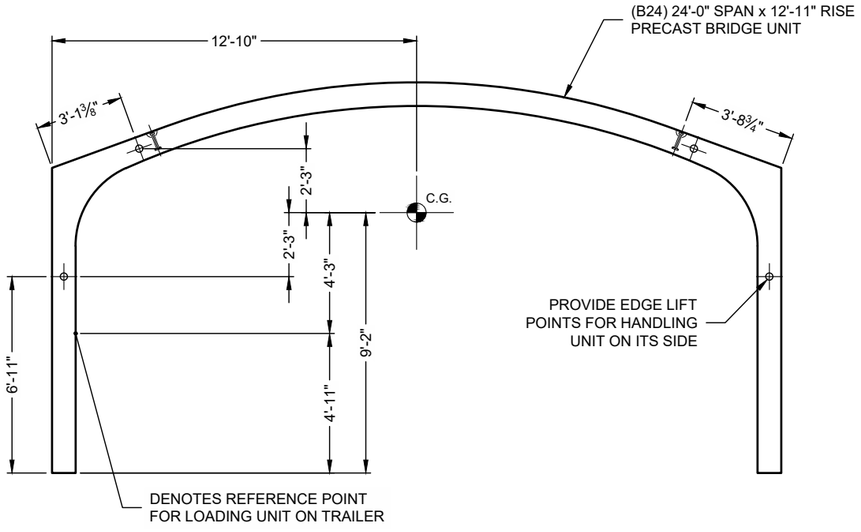
PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR		DRAWN: PJW
CHECKED: EA		APPROVED: PAC
SHEET NO.: S11 OF S26		

~~ADDENDUM NO. 1~~



PLAN - C4 - 1 REQUIRED

TOTAL WEIGHT = 24.4 TONS



ELEVATION 12

TYPE 2

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- SEE SHEET S2 FOR BRIDGE UNIT DIMENSIONS
- MANUFACTURER SHALL MARK END OF UNIT C4 WITH REINFORCING BLOCKOUT PRIOR TO SHIPPING.

ARCH UNIT		
CONCRETE	REINF. STEEL	WWF
28-DAY: 5000 PSI	60,000 PSI UNCOATED	65,000 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.

REINFORCING CAST IN BRIDGE UNIT - C4

MARK	SIZE	QTY.	LENGTH	TYPE	A	B	C
C4-301	3	16	1'-7¼"	2	7¼"	6"	
C4-302	3	16	1'-7⅜"	2	7⅜"	6"	
C4-303	3	16	1'-7⅝"	2	7⅝"	6"	
C4-304	3	16	1'-8⅛"	2	8⅛"	6"	
C4-305	3	16	1'-8¾"	2	8¾"	6"	
C4-306	3	16	1'-9⅜"	2	9⅜"	6"	
C4-501	5	6	4'-0"	STR.			

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

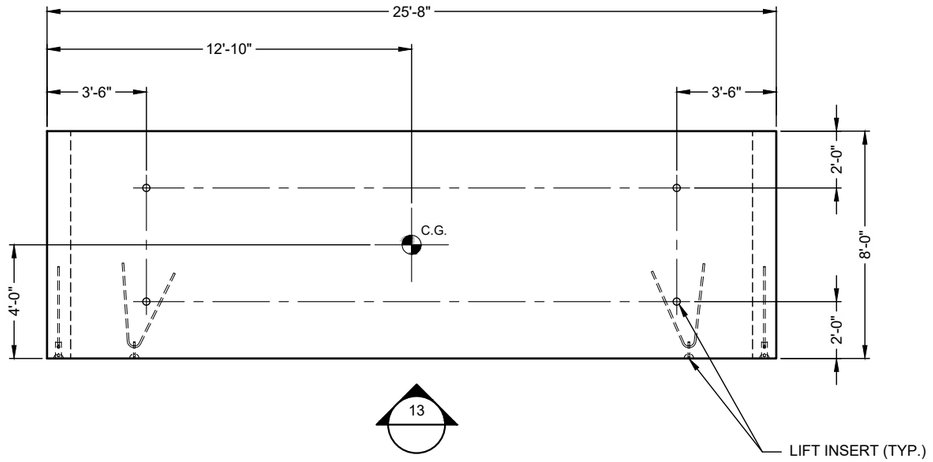
CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

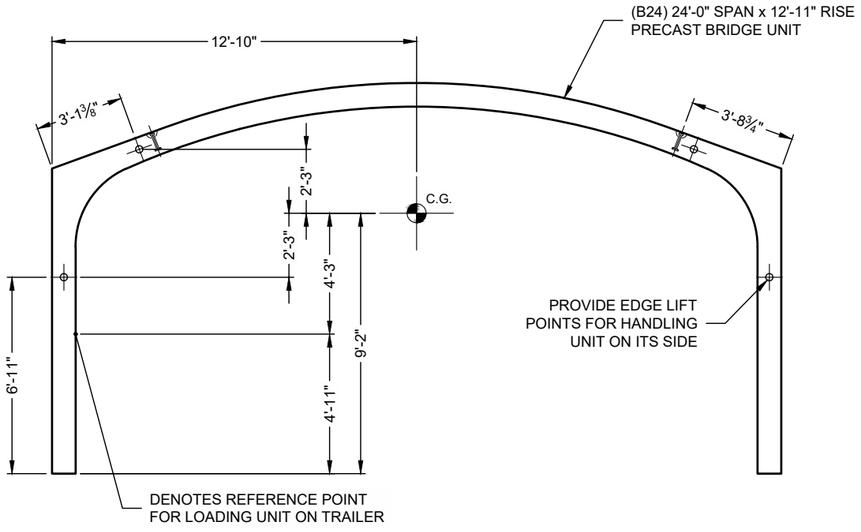
LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S12 OF S26		



PLAN - C5 - 5 REQUIRED

TOTAL WEIGHT = 24.4 TONS



ELEVATION 13

TYPE 2

ADDENDUM NO. 1

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- SEE SHEET S2 FOR BRIDGE UNIT DIMENSIONS

ARCH UNIT		
CONCRETE	REINF. STEEL	WWF
28-DAY: 5000 PSI	60,000 PSI UNCOATED	65,000 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.

REINFORCING CAST IN BRIDGE UNIT - C5

MARK	SIZE	QTY.	LENGTH	TYPE	A	B	C
C5-301	3	16	1'-7¼"	2	7¼"	6"	
C5-302	3	16	1'-7⅜"	2	7⅜"	6"	
C5-303	3	16	1'-7⅝"	2	7⅝"	6"	
C5-304	3	16	1'-8⅛"	2	8⅛"	6"	
C5-305	3	16	1'-8¾"	2	8¾"	6"	
C5-306	3	16	1'-9⅜"	2	9⅜"	6"	

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR		DRAWN: PJW
CHECKED: EA		APPROVED: PAC

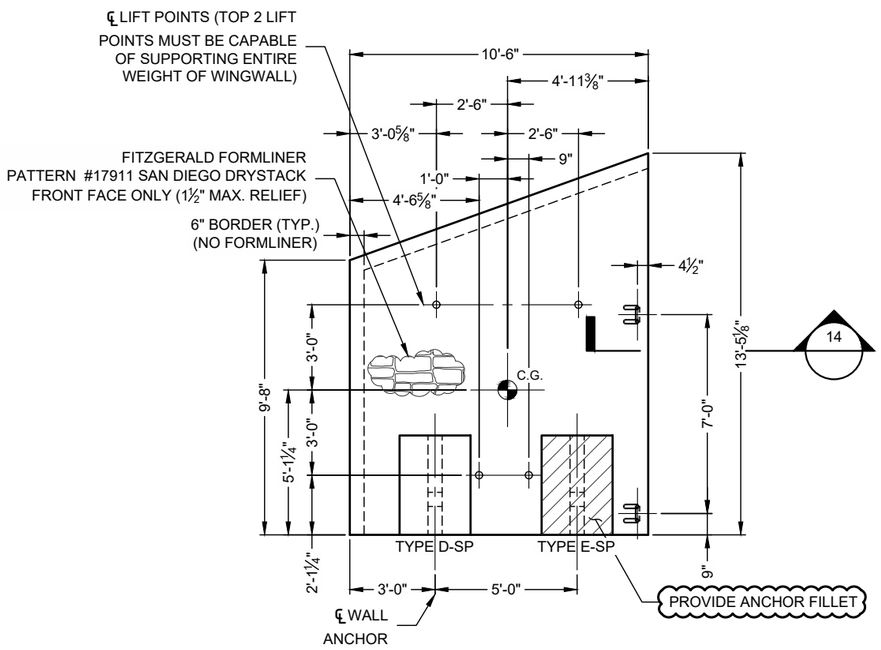
SHEET NO.: S13 OF S26

ADDENDUM NO. 1

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF WINGWALL
- BACK FACE DENOTES ANCHOR SIDE OF WINGWALL
- WINGWALL WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

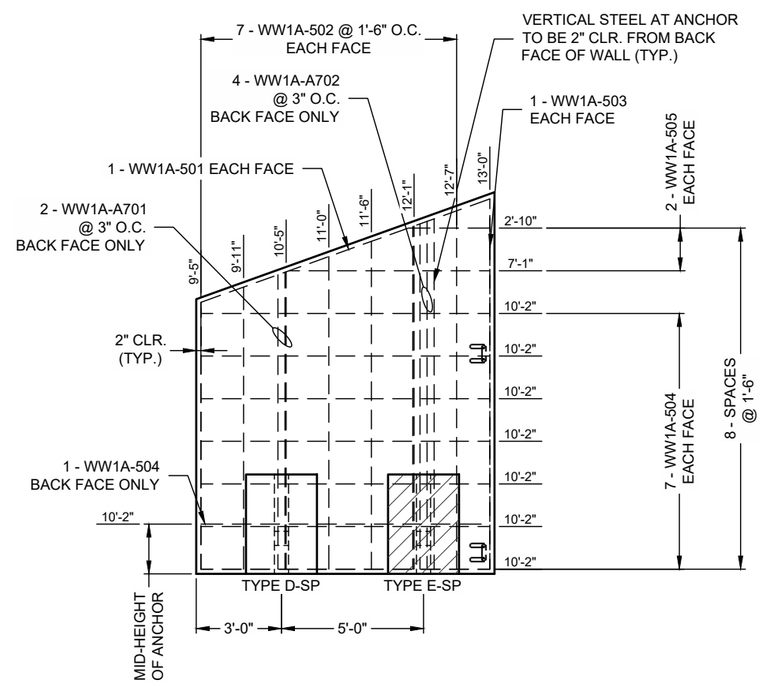
WINGWALL		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

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.



WINGWALL - WW1A

TOTAL WEIGHT = 12.4 TONS

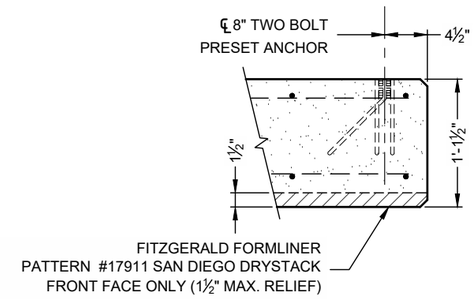


REINFORCING DETAIL - WW1A

(FOR ANCHOR REINFORCING SEE SHEET S22)

REINFORCING CAST IN WINGWALL - WW1A

MARK	SIZE	QTY.	LENGTH	TYPE	A	B	C
WW1A-501	5	2	10'-10"	STR.			
WW1A-502	5	14	9'-5" TO 12'-7"	STR.			
WW1A-503	5	2	13'-0"	STR.			
WW1A-504	5	15	10'-2"	STR.			
WW1A-505	5	4	2'-10" TO 7'-1"	STR.			
WW1A-A701	7	2	10'-4" TO 10'-5"	STR.			
WW1A-A702	7	4	12'-1" TO 12'-4"	STR.			



SECTION 14

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

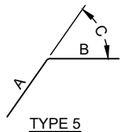
LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S14 OF S26		

ADDENDUM NO. 1

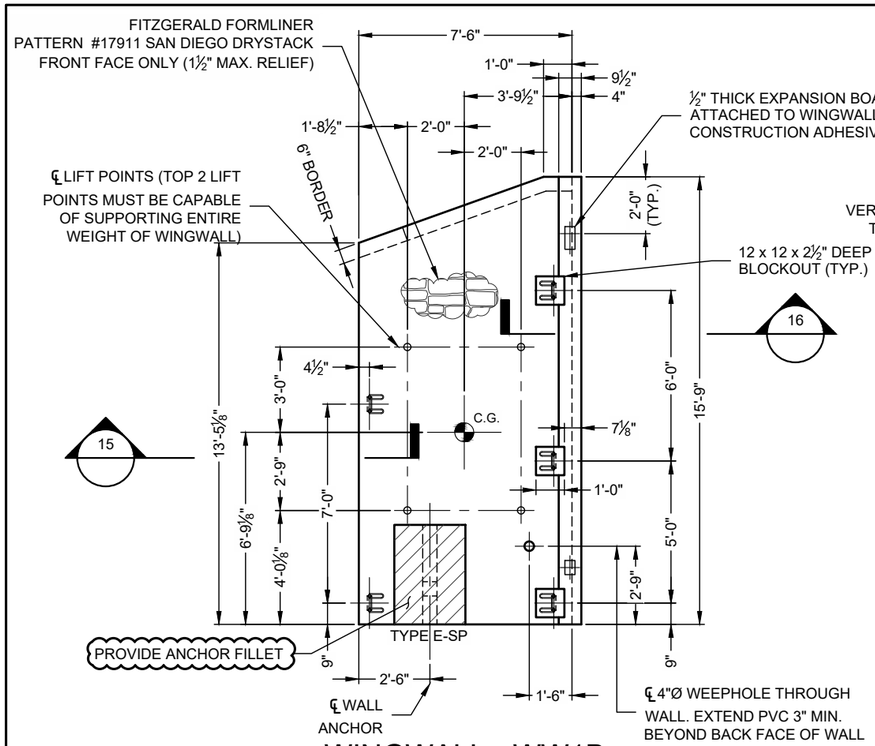
NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF WINGWALL
- BACK FACE DENOTES ANCHOR SIDE OF WINGWALL
- WINGWALL WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

WINGWALL		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED



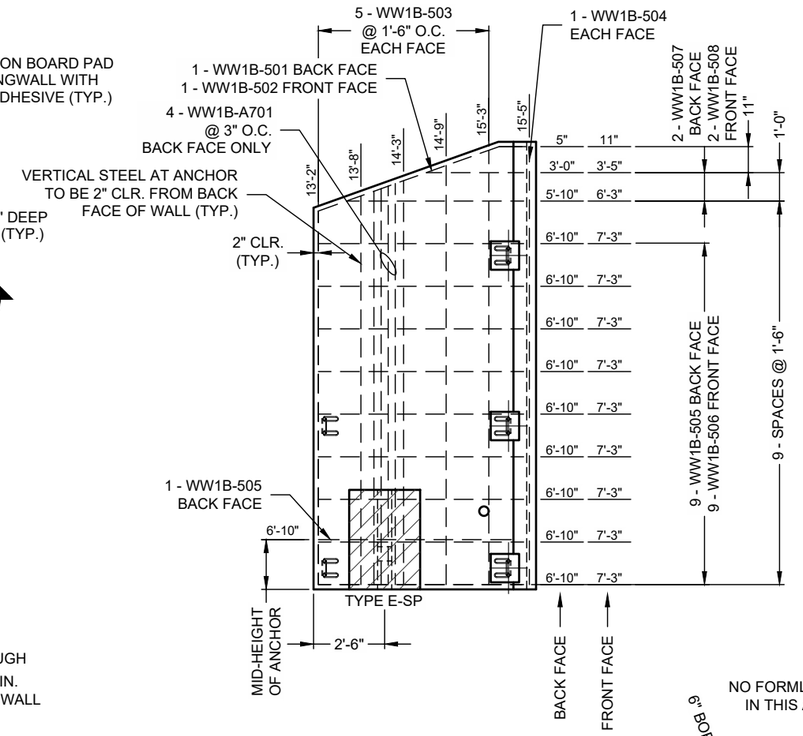
TYPE 5

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.



WINGWALL - WW1B

TOTAL WEIGHT = 10.5 TONS

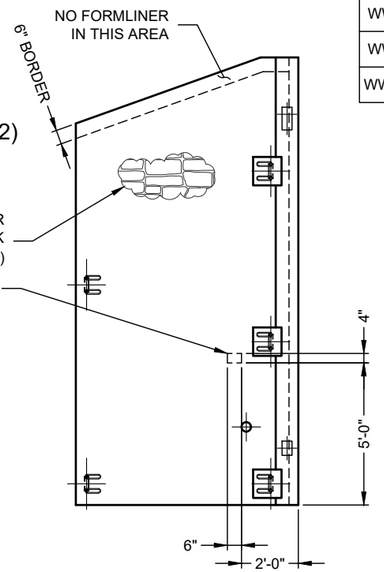


REINFORCING DETAIL - WW1B

(FOR ANCHOR REINFORCING SEE SHEET S22)

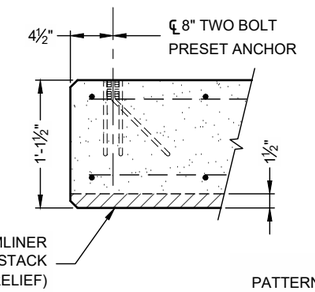
REINFORCING CAST IN WINGWALL - WW1B

MARK	SIZE	QTY.	LENGTH	TYPE	A	B	C
WW1B-501	5	1	7'-2"	5	6'-9"	5"	20°
WW1B-502	5	1	7'-8"	5	6'-9"	11"	20°
WW1B-503	5	10	13'-2" TO 15'-3"	STR.			
WW1B-504	5	2	15'-5"	STR.			
WW1B-505	5	10	6'-10"	STR.			
WW1B-506	5	9	7'-3"	STR.			
WW1B-507	5	2	3'-0" TO 5'-10"	STR.			
WW1B-508	5	2	3'-5" TO 6'-3	STR.			
WW1B-A701	7	4	13'-10" TO 14'-1"	STR.			

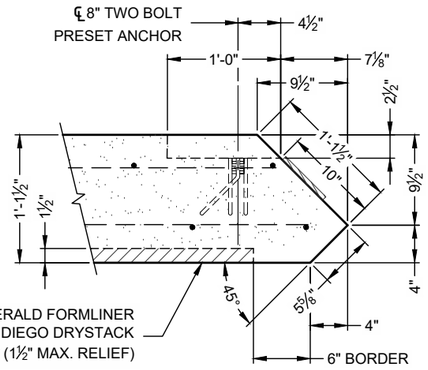


WINGWALL FORMLINER DETAIL - WW1B

(ELEVATION IS LOOKING INTO THE FORM)



SECTION 15



SECTION 16

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

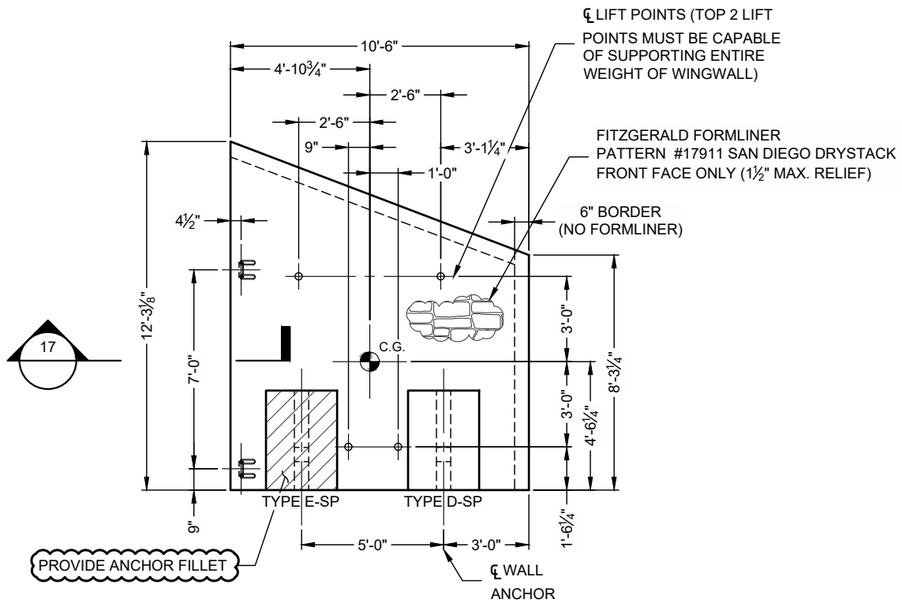
PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S15 OF S26		

ADDENDUM NO. 1

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF WINGWALL
- BACK FACE DENOTES ANCHOR SIDE OF WINGWALL
- WINGWALL WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

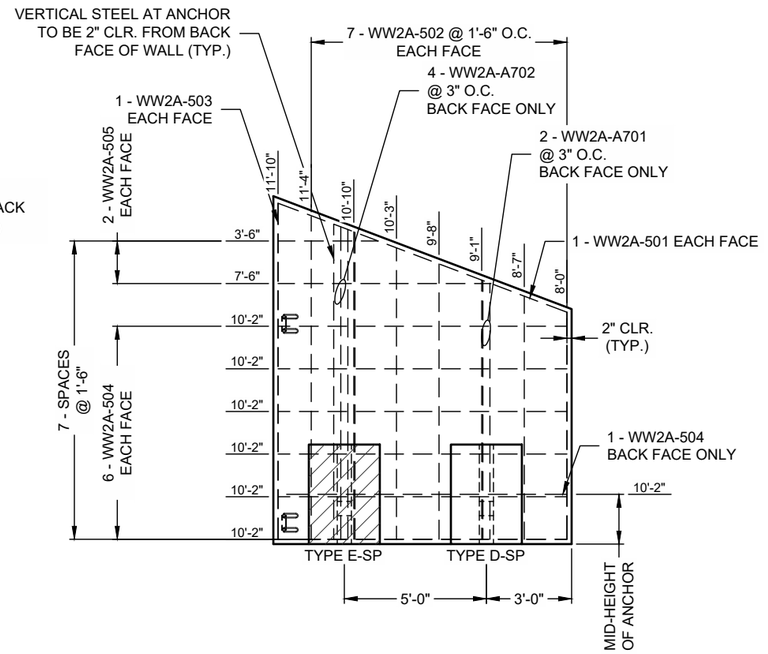
WINGWALL		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

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.



WINGWALL - WW2A

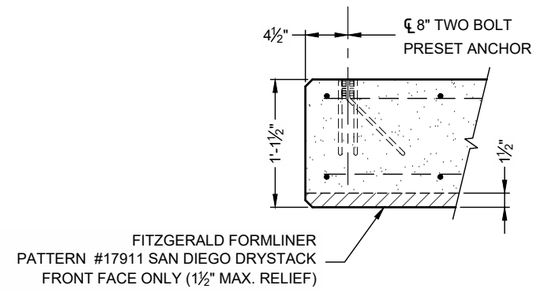
TOTAL WEIGHT = 11.3 TONS



REINFORCING DETAIL - WW2A

(FOR ANCHOR REINFORCING SEE SHEET S22)

REINFORCING CAST IN WINGWALL - WW2A							
MARK	SIZE	QTY.	LENGTH	TYPE	A	B	C
WW2A-501	5	2	10'-10"	STR.			
WW2A-502	5	14	8'-0" TO 11'-4"	STR.			
WW2A-503	5	2	11'-10"	STR.			
WW2A-504	5	13	10'-2"	STR.			
WW2A-505	5	4	3'-6" TO 7'-6"	STR.			
WW2A-A701	7	2	9'-0" TO 9'-1"	STR.			
WW2A-A702	7	4	10'-9" TO 11'-0"	STR.			



SECTION 17

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

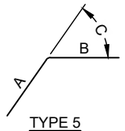
LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR		DRAWN: PJW
CHECKED: EA		APPROVED: PAC
SHEET NO.: S16 OF S26		

ADDENDUM NO. 1

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF WINGWALL
- BACK FACE DENOTES ANCHOR SIDE OF WINGWALL
- WINGWALL WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

WINGWALL		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

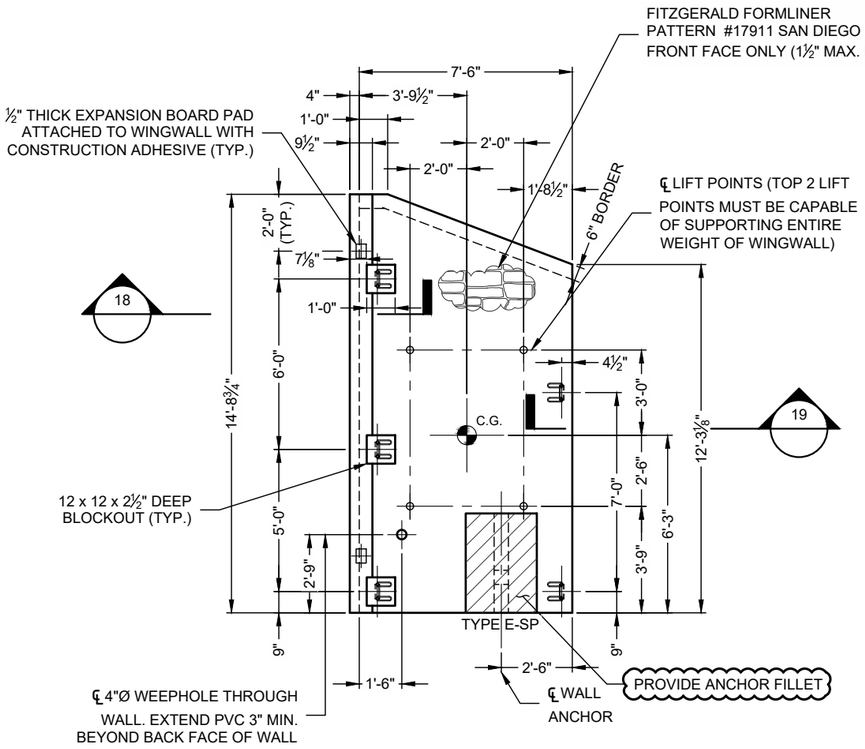


TYPE 5

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.

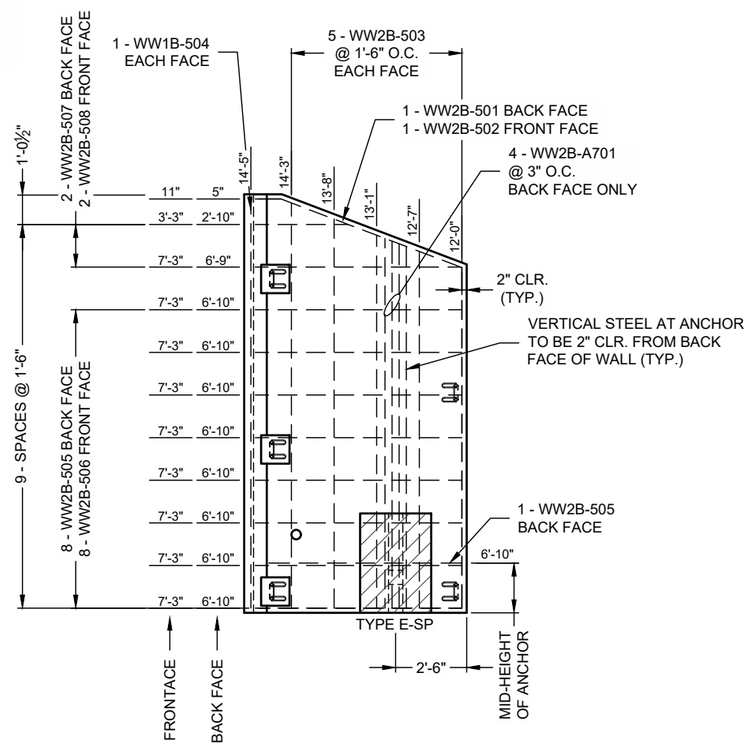
REINFORCING CAST IN WINGWALL - WW2B

MARK	SIZE	QTY.	LENGTH	TYPE	A	B	C
WW2B-501	5	1	7'-3"	5	6'-10"	5"	21°
WW2B-502	5	1	7'-9"	5	6'-10"	11"	21°
WW2B-503	5	10	12'-0" TO 14'-3"	STR.			
WW2B-504	5	2	14'-5"	STR.			
WW2B-505	5	9	6'-10"	STR.			
WW2B-506	5	8	7'-3"	STR.			
WW2B-507	5	2	2'-10" TO 6'-9"	STR.			
WW2B-508	5	2	3'-3" TO 7'-3"	STR.			
WW2B-A701	7	4	12'-9" TO 13'-0"	STR.			



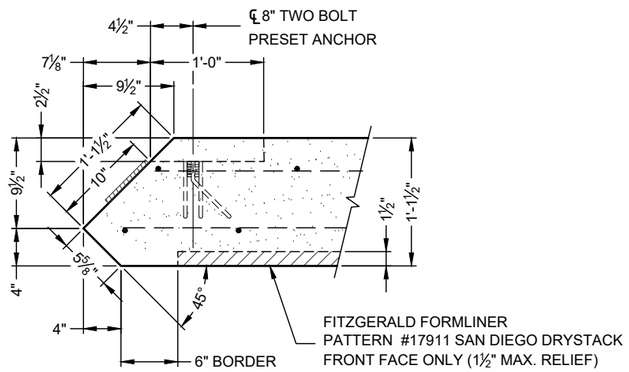
WINGWALL - WW2B

TOTAL WEIGHT = 9.8 TONS

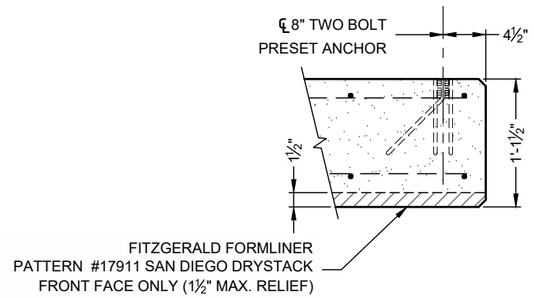


REINFORCING DETAIL - WW2B

(FOR ANCHOR REINFORCING SEE SHEET S22)



SECTION 18



SECTION 19

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S17 OF S26		

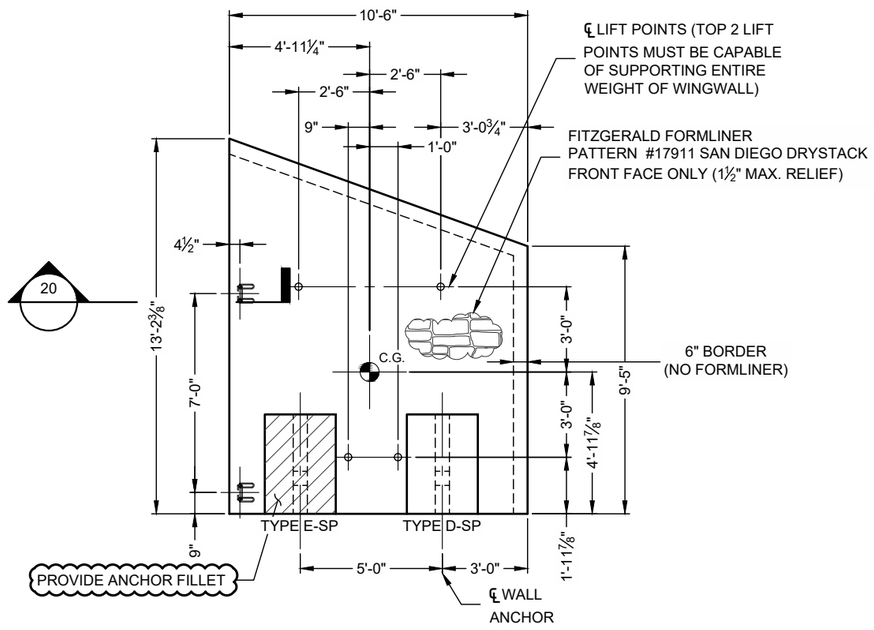
I:\MERLIN\PROJECTACTIVE\781600\781640\781640-10-CON_SPAN\DRAWINGS\FABRICATION\APP-781640-010-CB-FAB-D.DWG 12/10/2025 8:22 AM

ADDENDUM NO. 1

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF WINGWALL
- BACK FACE DENOTES ANCHOR SIDE OF WINGWALL
- WINGWALL WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

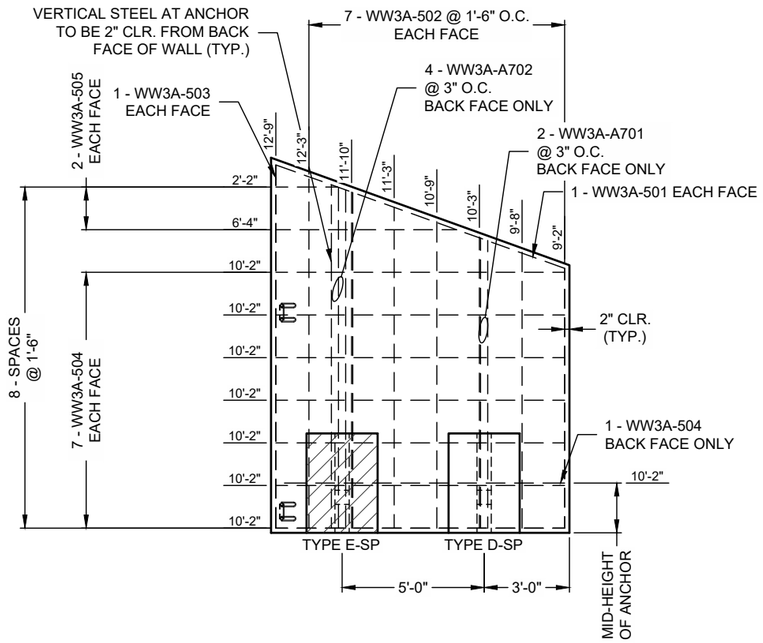
WINGWALL		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

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.



WINGWALL - WW3A

TOTAL WEIGHT = 12.2 TONS

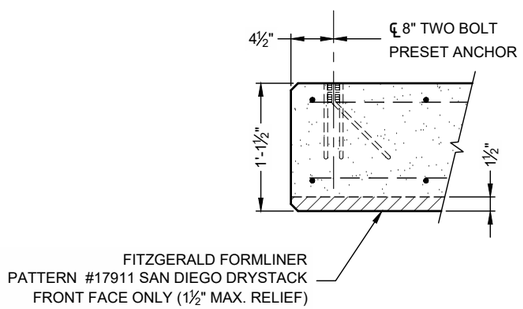


REINFORCING DETAIL - WW3A

(FOR ANCHOR REINFORCING SEE SHEET S22)

REINFORCING CAST IN WINGWALL - WW3A

MARK	SIZE	QTY.	LENGTH	TYPE	A	B	C
WW3A-501	5	2	10'-10"	STR.			
WW3A-502	5	14	9'-2" TO 12'-3"	STR.			
WW3A-503	5	2	12'-9"	STR.			
WW3A-504	5	15	10'-2"	STR.			
WW3A-505	5	4	2'-2" TO 6'-4"	STR.			
WW3A-A701	7	2	10'-1" TO 10'-3"	STR.			
WW3A-A702	7	4	11'-10" TO 12'-1"	STR.			



SECTION 20

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

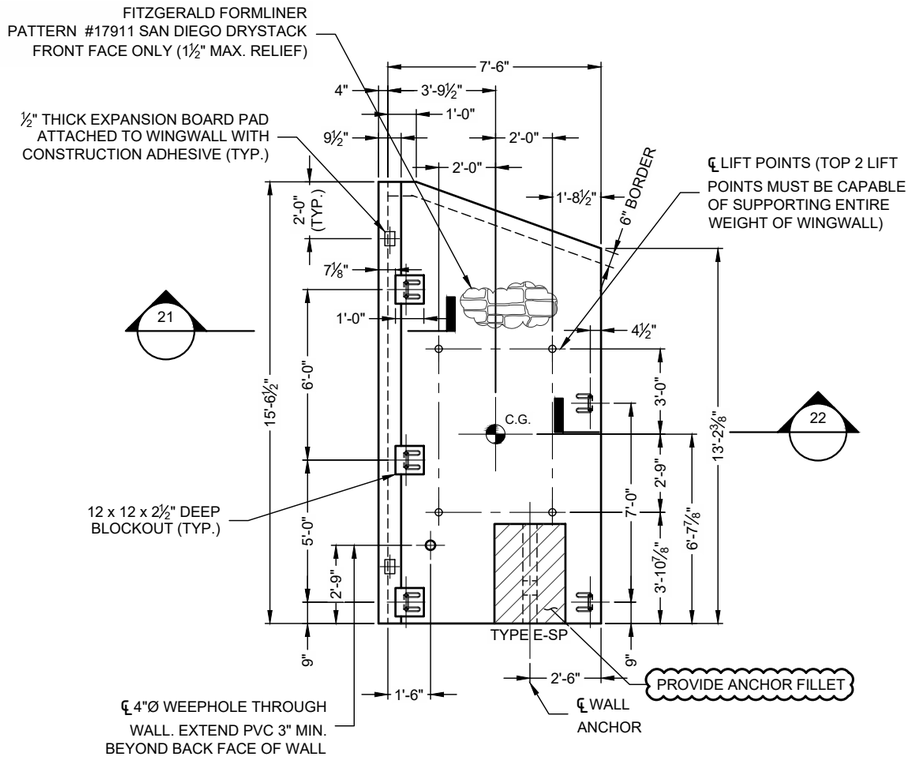
LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S18 OF S26		

ADDENDUM NO. 1

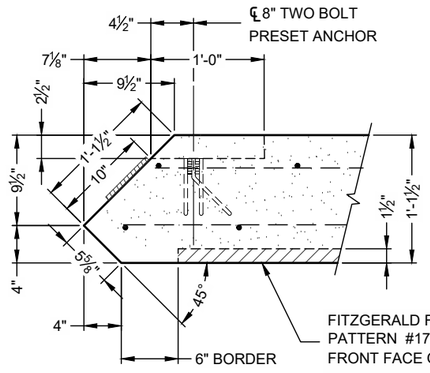
NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF WINGWALL
- BACK FACE DENOTES ANCHOR SIDE OF WINGWALL
- WINGWALL WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

WINGWALL		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

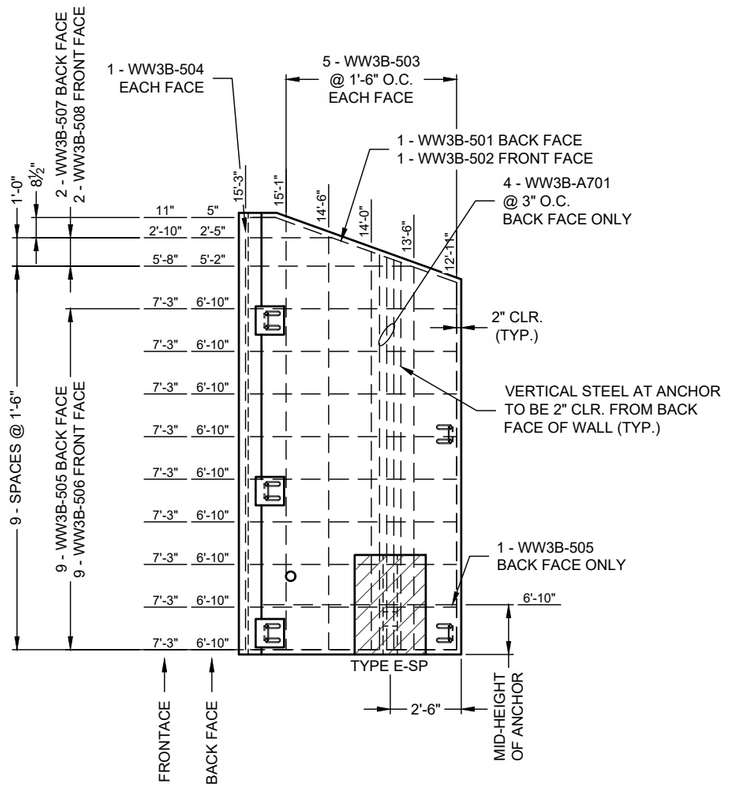


WINGWALL - WW3B

TOTAL WEIGHT = 10.4 TONS

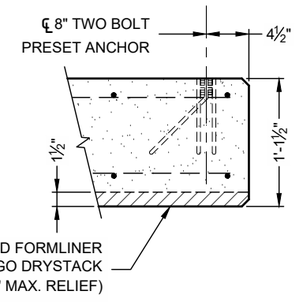


SECTION 21

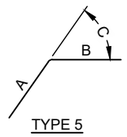


REINFORCING DETAIL - WW3B

(FOR ANCHOR REINFORCING SEE SHEET S22)



SECTION 22



TYPE 5

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.

REINFORCING CAST IN WINGWALL - WW3B

MARK	SIZE	QTY.	LENGTH	TYPE	A	B	C
WW3B-501	5	1	7'-4"	5	6'-11"	5"	23°
WW3B-502	5	1	7'-10"	5	6'-11"	11"	23°
WW3B-503	5	10	12'-5" TO 14'-11"	STR.			
WW3B-504	5	2	15'-1"	STR.			
WW3B-505	5	10	6'-10"	STR.			
WW3B-506	5	9	7'-3"	STR.			
WW3B-507	5	2	1'-10" TO 4'-2"	STR.			
WW3B-508	5	2	2'-3" TO 4'-8"	STR.			
WW3B-A701	7	4	13'-3" TO 13'-6"	STR.			

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

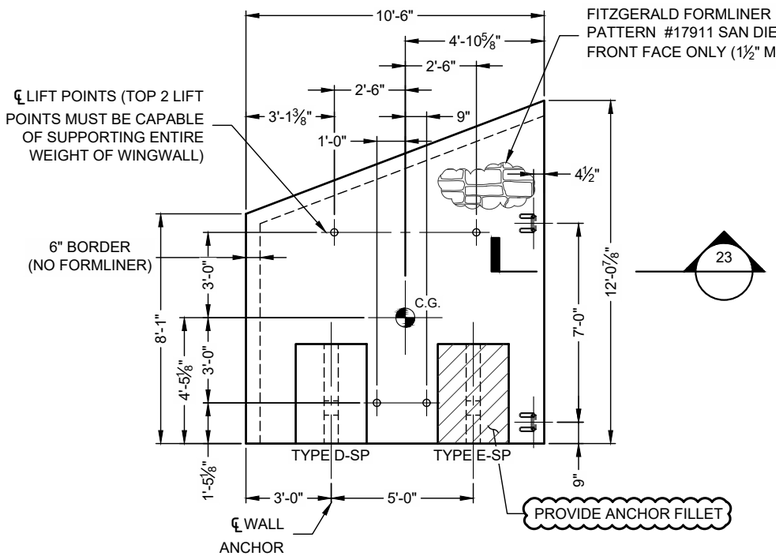
PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S19 OF S26		

ADDENDUM NO. 1

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF WINGWALL
- BACK FACE DENOTES ANCHOR SIDE OF WINGWALL
- WINGWALL WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

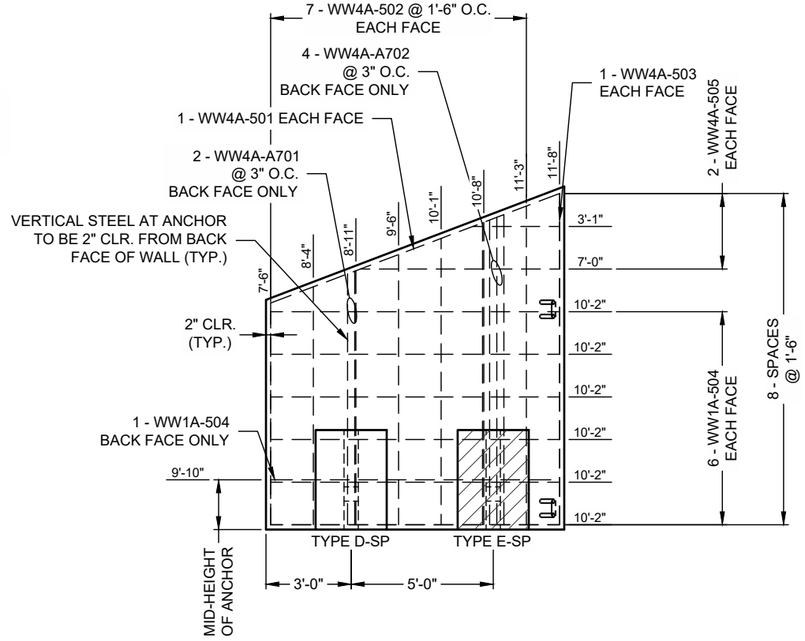
WINGWALL		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

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.



WINGWALL - WW4A

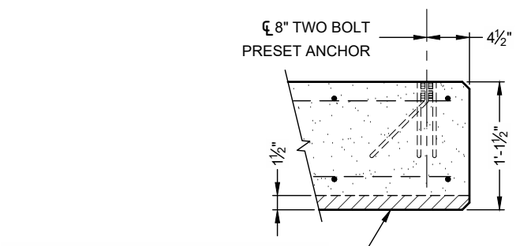
TOTAL WEIGHT = 11.1 TONS



REINFORCING DETAIL - WW4A

(FOR ANCHOR REINFORCING SEE SHEET S22)

REINFORCING CAST IN WINGWALL - WW4A							
MARK	SIZE	QTY.	LENGTH	TYPE	A	B	C
WW4A-501	5	2	10'-10"	STR.			
WW4A-502	5	14	7'-6" TO 11'-3"	STR.			
WW4A-503	5	2	11'-8"	STR.			
WW4A-504	5	13	9'-10"	STR.			
WW4A-505	5	4	2'-9" TO 6'-6"	STR.			
WW4A-A701	7	2	8'-7" TO 8'-8"	STR.			
WW4A-A702	7	4	10'-6" TO 10'-10"	STR.			



SECTION 23

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

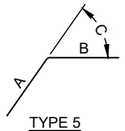
LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S20 OF S26		

ADDENDUM NO. 1

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF WINGWALL
- BACK FACE DENOTES ANCHOR SIDE OF WINGWALL
- WINGWALL WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

WINGWALL		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

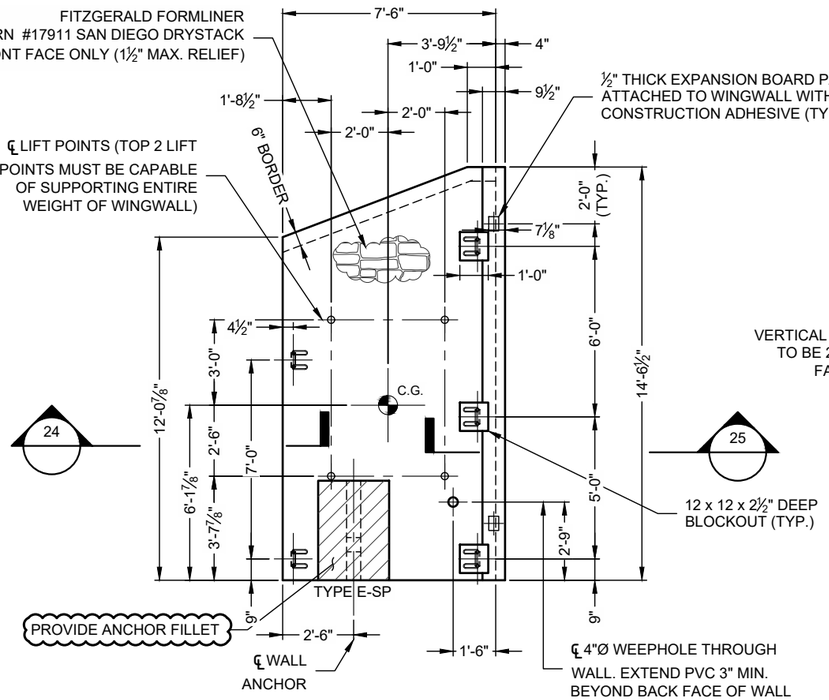


TYPE 5

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.

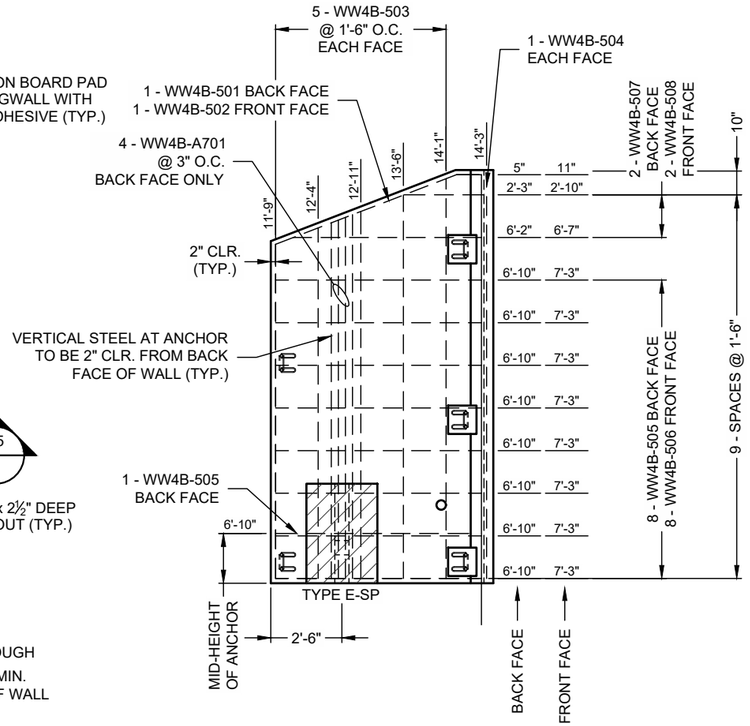
REINFORCING CAST IN WINGWALL - WW4B

MARK	SIZE	QTY.	LENGTH	TYPE	A	B	C
WW4B-501	5	1	7'-3"	5	6'-10"	5"	22°
WW4B-502	5	1	7'-9"	5	6'-10"	11"	22°
WW4B-503	5	10	11'-9" TO 14'-1"	STR.			
WW4B-504	5	2	14'-3"	STR.			
WW4B-505	5	9	6'-10"	STR.			
WW4B-506	5	8	7'-3"	STR.			
WW4B-507	5	2	2'-3" TO 6'-2"	STR.			
WW4B-508	5	2	2'-10" TO 6'-7"	STR.			
WW4B-A701	7	4	12'-6" TO 12'-10"	STR.			



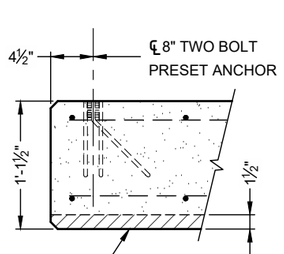
WINGWALL - WW4B

TOTAL WEIGHT = 9.7 TONS

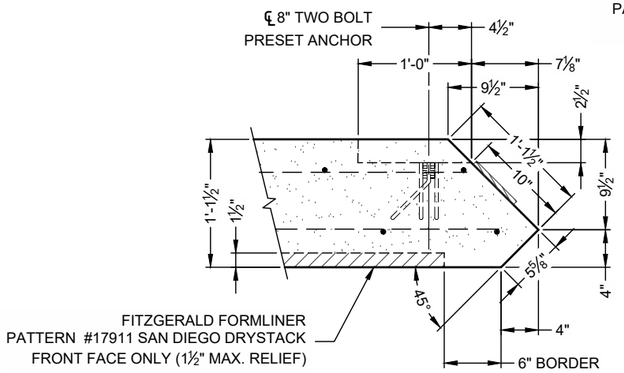


REINFORCING DETAIL - WW4B

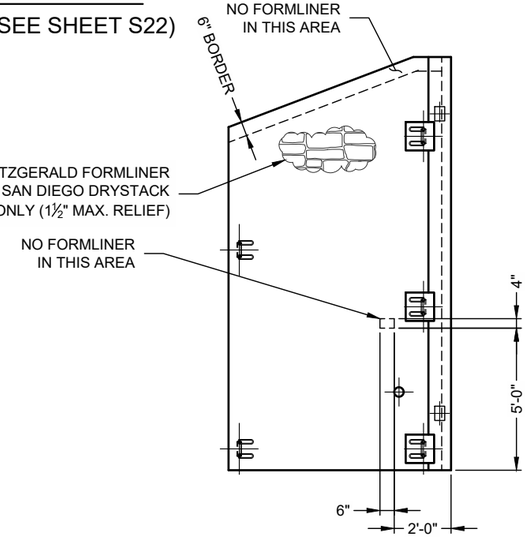
(FOR ANCHOR REINFORCING SEE SHEET S22)



SECTION 24



SECTION 25



WINGWALL FORMLINER DETAIL - WW4B

(ELEVATION IS LOOKING INTO THE FORM)

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

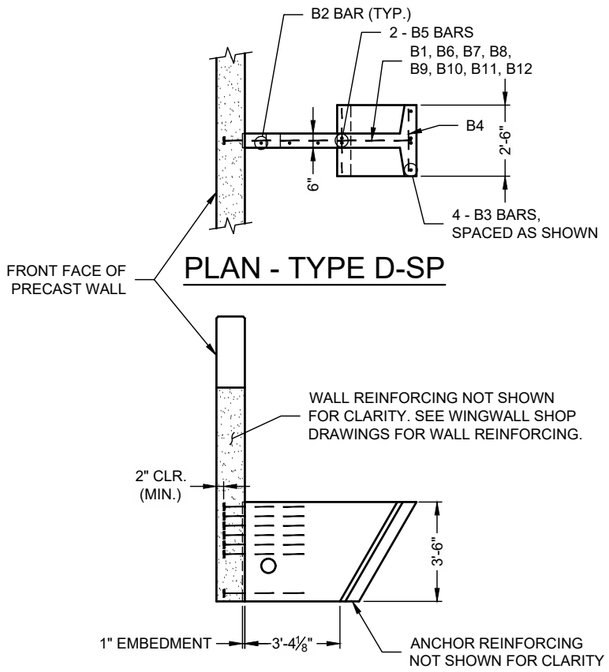
CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S21 OF S26		

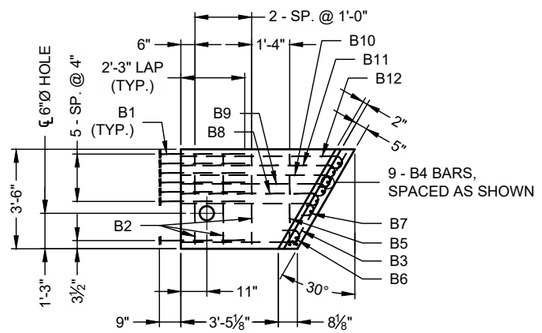
ADDENDUM NO. 1



SECTION - TYPE D-SP

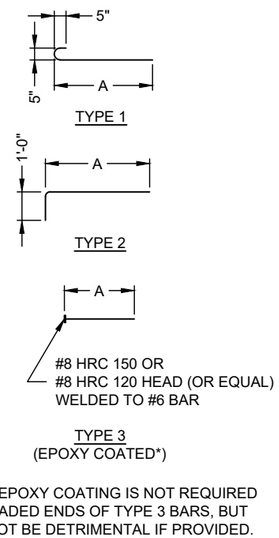
BAR LIST - TYPE D-SP						
MARK	QTY	SIZE	A	TYPE	LENGTH	FINISH
B1	7	#6	3'-0"	3	——	EPOXY*
B2	3	#5	——	STR.	3'-2"	BLACK
B3	4	#5	——	STR.	3'-8"	BLACK
B4	9	#5	——	STR.	2'-2"	BLACK
B5	2	#5	3'-2"	2	——	BLACK
B6	1	#5	4'-2"	1	——	BLACK
B7	1	#5	4'-8"	1	——	BLACK
B8	1	#5	4'-10"	1	——	BLACK
B9	1	#5	5'-1"	1	——	BLACK
B10	1	#5	5'-3"	1	——	BLACK
B11	1	#5	5'-5"	1	——	BLACK
B12	1	#5	5'-8"	1	——	BLACK

NOTE: "STR." DENOTES STRAIGHT BAR. STANDARD CLEARANCE = 2"



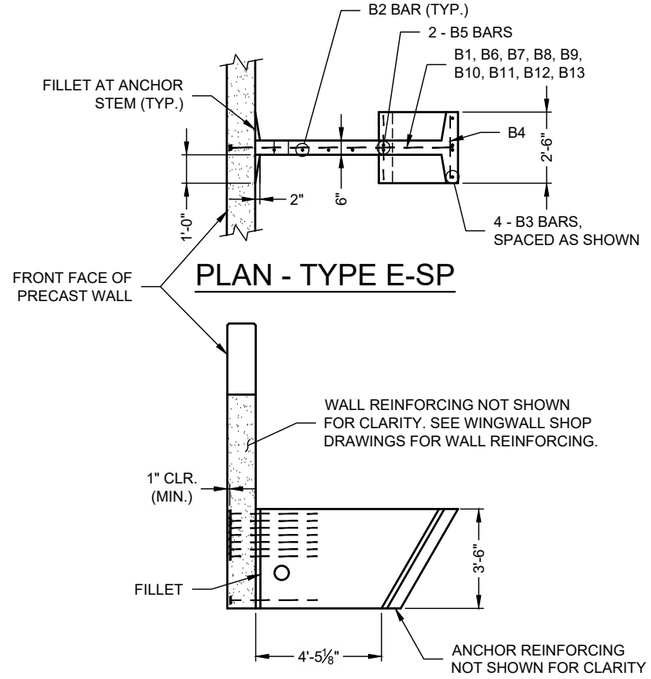
PRECAST ANCHOR TYPE D-SP

TOTAL WEIGHT = 1.028 TONS



*NOTE: EPOXY COATING IS NOT REQUIRED ON HEADED ENDS OF TYPE 3 BARS, BUT WILL NOT BE DETRIMENTAL IF PROVIDED.

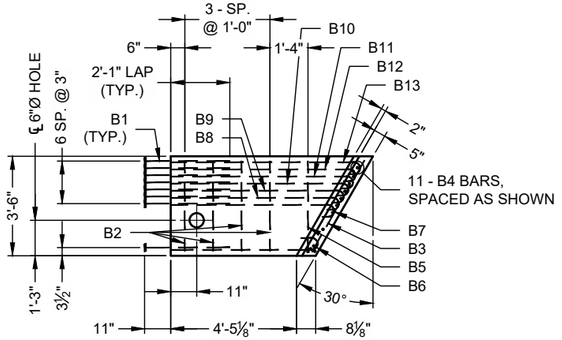
*NOTE: HRC HEADS PROVIDED BY HEADED REINFORCEMENT CORP.



SECTION - TYPE E-SP

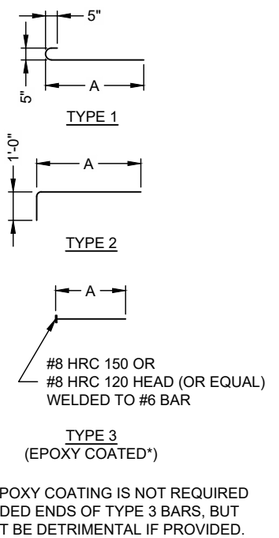
BAR LIST - TYPE E-SP						
MARK	QTY	SIZE	A	TYPE	LENGTH	FINISH
B1	8	#6	3'-0"	3	——	EPOXY*
B2	4	#5	——	STR.	3'-2"	BLACK
B3	4	#5	——	STR.	3'-8"	BLACK
B4	11	#5	——	STR.	2'-2"	BLACK
B5	2	#5	3'-2"	2	——	BLACK
B6	1	#5	5'-2"	1	——	BLACK
B7	1	#5	5'-9"	1	——	BLACK
B8	1	#5	5'-11"	1	——	BLACK
B9	1	#5	6'-1"	1	——	BLACK
B10	1	#5	6'-3"	1	——	BLACK
B11	1	#5	6'-5"	1	——	BLACK
B12	1	#5	6'-6"	1	——	BLACK
B13	1	#5	6'-8"	1	——	BLACK

NOTE: "STR." DENOTES STRAIGHT BAR. STANDARD CLEARANCE = 2"



PRECAST ANCHOR TYPE E-SP

TOTAL WEIGHT = 1.159 TONS



*NOTE: EPOXY COATING IS NOT REQUIRED ON HEADED ENDS OF TYPE 3 BARS, BUT WILL NOT BE DETRIMENTAL IF PROVIDED.

*NOTE: HRC HEADS PROVIDED BY HEADED REINFORCEMENT CORP.

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

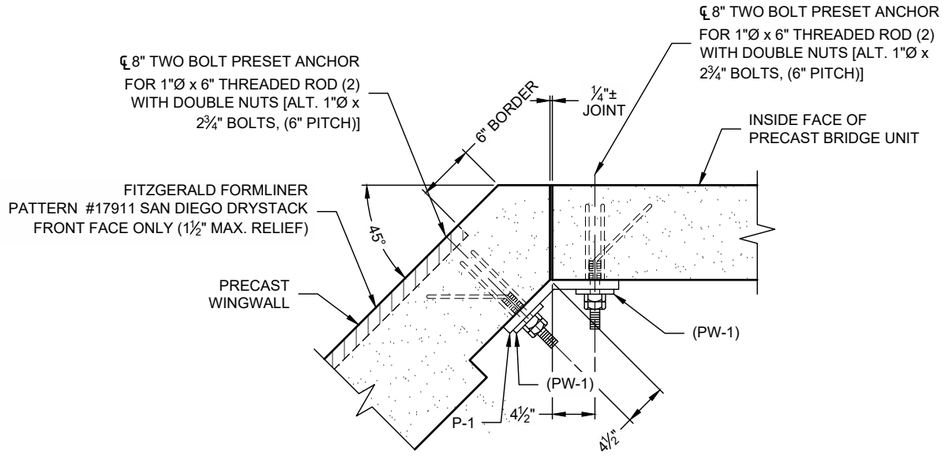
CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

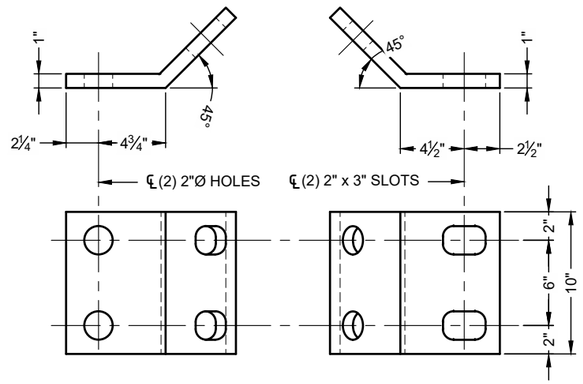
PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR		DRAWN: PJW
CHECKED: EA		APPROVED: PAC
SHEET NO.: S22 OF S26		

ADDENDUM NO. 1



PLAN VIEW

TYPICAL CONNECTION DETAIL - P-1

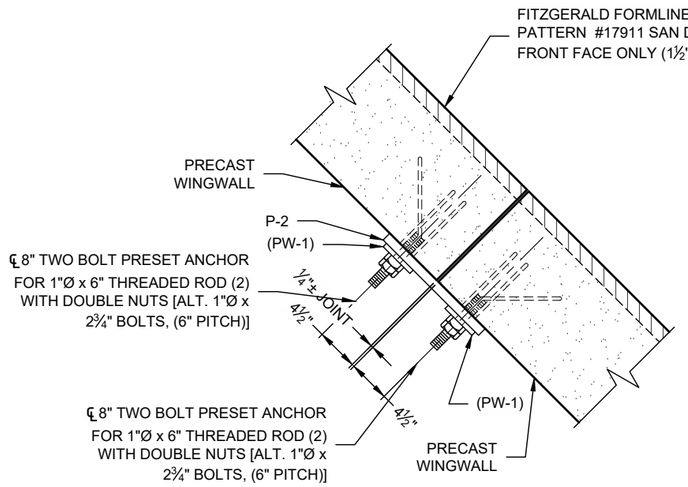


UNIT LEG WINGWALL LEG

P-1

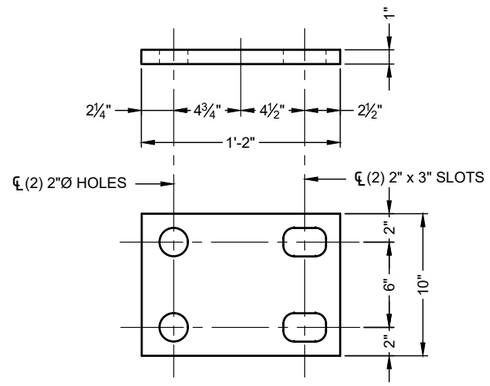
(℄, 1" x 14" x 10")
(GALVANIZED AS PER ASTM A123)

PLATE P-1
TOTAL REQUIRED = 12
(4) PW-1 REQ'D PER PLATE



PLAN VIEW

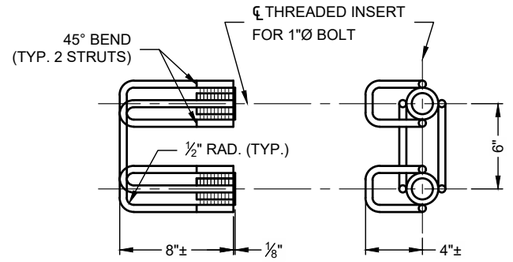
TYPICAL CONNECTION DETAIL - P-2



P-2

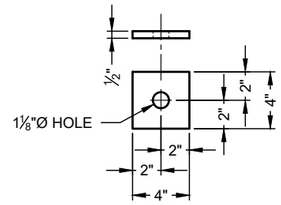
(℄, 1" x 14" x 10")
(GALVANIZED AS PER ASTM A123)

PLATE P-2
TOTAL REQUIRED = 8
(4) PW-1 REQ'D PER PLATE



SIDE VIEW FRONT VIEW

TWO BOLT PRESET ANCHOR



PW-1

(℄WASHER, ½" x 4" x 4")
(GALVANIZED AS PER ASTM A123)

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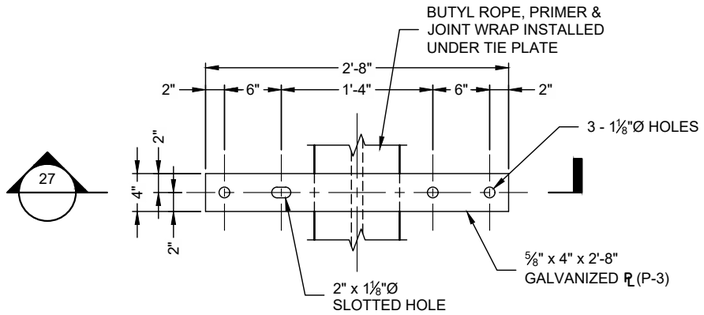
CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

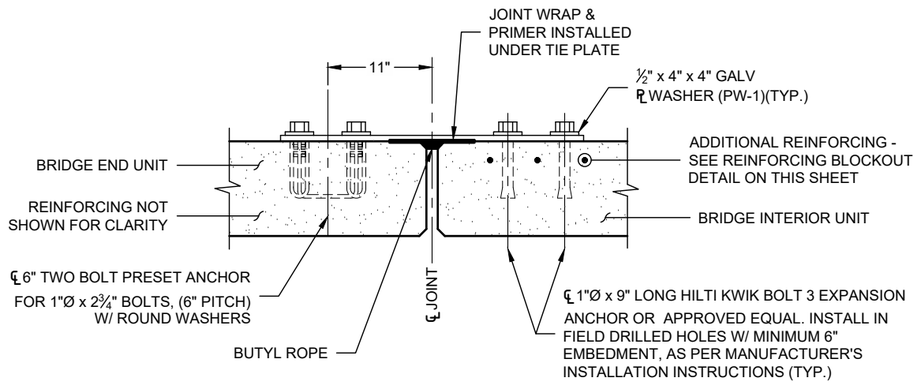
LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S23 OF S26		

ADDENDUM NO. 1

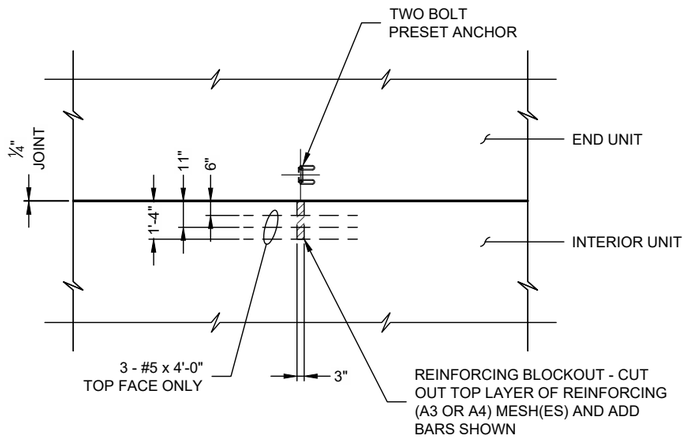


DETAIL 26 / S1

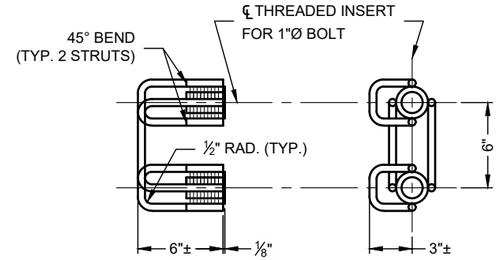


SECTION 27

PLATE P-3
TOTAL REQUIRED = 4 (4) PW-1 REQ'D PER PLATE

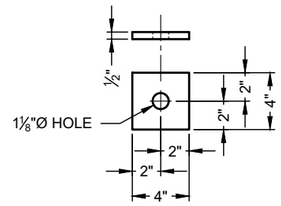


REINFORCING BLOCKOUT DETAIL



SIDE VIEW FRONT VIEW

TWO BOLT PRESET ANCHOR



PW-1

(℄ WASHER, ½" x 4" x 4")
(GALVANIZED AS PER ASTM A123)

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CONSPAN BRIDGE SYSTEMS

FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR		DRAWN: PJW
CHECKED: EA		APPROVED: PAC
SHEET NO.: S24 OF S26		

I:\MERLIN\PROJECT\ACTIVE\781600\781640\781640-10-CON_SPAN\DRAWINGS\FABRICATION\APP-781640-010-CB-FAB-D.DWG 12/10/2025 8:23 AM

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

ADDENDUM NO. 1

1. DESCRIPTION
   - 1.1. TYPE - THIS WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTING A CON/SPAN® BRIDGE SYSTEM 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 SHALL GOVERN.
   - 1.2. DESIGNATION - PRECAST REINFORCED CONCRETE CON/SPAN® BRIDGE UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY SPAN AND RISE. PRECAST REINFORCED CONCRETE WINGWALLS AND HEADWALLS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT, AND DEFLECTION ANGLE. PRECAST REINFORCED CONCRETE EXPRESS™ FOUNDATION UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT AND WIDTH.

2. DESIGN
   - 2.1. SPECIFICATIONS - THE PRECAST ELEMENTS ARE DESIGNED IN ACCORDANCE WITH THE "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" 9TH EDITION, ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2020. 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.)

3. MATERIALS
   - 3.1. CONCRETE - THE CONCRETE FOR THE PRECAST ELEMENTS SHALL BE AIR-ENTRAINED WHEN INSTALLED IN AREAS SUBJECT TO FREEZE-THAW CONDITIONS, COMPOSED OF PORTLAND CEMENT, FINE AND COARSE AGGREGATES, ADMIXTURES AND WATER. AIR-ENTRAINED CONCRETE SHALL CONTAIN 6 ± 2 PERCENT AIR. THE AIR- ENTRAINING ADMIXTURE SHALL CONFORM TO AASHTO M154. THE MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE AS SHOWN ON THE SHOP DRAWINGS.
     - 3.1.1.1. PORTLAND CEMENT - SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATIONS C150-TYPE I, TYPE IL, TYPE II, OR TYPE III CEMENT.
     - 3.1.2. AGGREGATE - SHALL CONSIST OF STONE HAVING A MAXIMUM SIZE OF 1 INCH. AGGREGATE SHALL MEET REQUIREMENTS FOR ASTM C33.
     - 3.1.3. 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 CONCRETE.
     - 3.1.4. CALCIUM CHLORIDE - THE ADDITION TO THE MIX OF CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE WILL NOT BE PERMITTED.
     - 3.1.5. 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 SACKS) PER CUBIC YARD OF CONCRETE.
   - 3.2. STEEL REINFORCEMENT
     - 3.2.1. THE MINIMUM STEEL YIELD STRENGTH SHALL BE 60,000 PSI, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS.
     - 3.2.2. ALL REINFORCING STEEL FOR THE PRECAST ELEMENTS SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE DETAILED SHOP DRAWINGS SUBMITTED BY THE MANUFACTURER.
     - 3.2.3. REINFORCEMENT SHALL CONSIST OF WELDED WIRE REINFORCING CONFORMING TO ASTM SPECIFICATION A 1064, OR DEFORMED STEEL BARS CONFORMING TO ASTM SPECIFICATION A 615, GRADE 60. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY CONSIST OF WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS.
   - 3.3. STEEL HARDWARE
     - 3.3.1. BOLTS AND THREADED RODS FOR WINGWALL CONNECTIONS SHALL CONFORM TO ASTM A 307. NUTS SHALL CONFORM TO AASHTO M292 (ASTM A194) GRADE 2H. ALL BOLTS, THREADED RODS AND NUTS USED IN WINGWALL CONNECTIONS SHALL BE MECHANICALLY ZINC COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
     - 3.3.2. STRUCTURAL STEEL FOR WINGWALL CONNECTION PLATES AND PLATE WASHERS SHALL CONFORM TO AASHTO M 270 (ASTM A 709) GRADE 36 AND SHALL BE HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
     - 3.3.3. INSERTS FOR WINGWALLS SHALL BE 1" DIAMETER TWO-BOLT PRESET WINGWALL ANCHORS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700 AND SHALL BE ELECTRO GALVANIZED IN ACCORDANCE WITH ASTM B633 SC-1.
     - 3.3.4. FERRULE LOOP INSERTS SHALL BE F-64 FERRULE LOOP INSERTS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700 AND SHALL BE ELECTRO GALVANIZED.
     - 3.3.5. HOOK BOLTS USED IN ATTACHED HEADWALL CONNECTIONS SHALL BE ASTM A307.
     - 3.3.6. INSERTS FOR DETACHED HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL, EXPANDED COIL INSERTS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700. COIL RODS AND NUTS USED IN HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL. WASHERS USED IN HEADWALL CONNECTIONS SHALL BE EITHER AISI TYPE 304 STAINLESS STEEL PLATE WASHERS OR AASHTO M270 (ASTM A709) GRADE 36 PLATE WASHERS HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
     - 3.3.7. MECHANICAL SPLICES OF REINFORCING BARS SHALL BE MADE USING THE DOWEL BAR SPLICER SYSTEM AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700, AND SHALL CONSIST OF THE DBDI SPLICE SYSTEM (DOWEL BAR SPLICER AND DOWEL-IN), OR AS MANUFACTURED BY BARSPLICE PRODUCTS INC, DAYTON, OHIO, (937)-275-8700, AND SHALL CONSIST OF BARSPLICER XP TYPE 2 SYSTEM.

4. MANUFACTURE OF PRECAST ELEMENTS - SUBJECT TO THE PROVISIONS OF SECTION 5, BELOW, THE PRECAST ELEMENT DIMENSION AND REINFORCEMENT DETAILS SHALL BE AS PRESCRIBED IN THE PLAN AND SHOP DRAWINGS PROVIDED BY THE MANUFACTURER.
   - 4.1. FORMS - THE FORMS USED IN MANUFACTURE SHALL BE SUFFICIENTLY RIGID AND ACCURATE TO MAINTAIN THE REQUIRED PRECAST ELEMENT DIMENSIONS WITHIN THE PERMISSIBLE VARIATIONS GIVEN IN SECTION 5 OF THESE SPECIFICATIONS. ALL CASTING SURFACES SHALL BE OF A SMOOTH MATERIAL.
   - 4.2. PLACEMENT OF REINFORCEMENT
     - 4.2.1. PLACEMENT OF REINFORCEMENT IN PRECAST BRIDGE UNITS - THE COVER OF CONCRETE OVER THE OUTSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2" MINIMUM. THE COVER OF CONCRETE OVER THE INSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 1½" MINIMUM, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS. THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 1" NOR MORE THAN 2" FROM THE ENDS OF EACH SECTION. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING SINGLE OR MULTIPLE LAYERS OF WELDED WIRE FABRIC (NOT TO EXCEED 3 LAYERS), SUPPLEMENTED WITH A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS, WHEN NECESSARY. WELDED WIRE FABRIC SHALL BE COMPOSED OF CIRCUMFERENTIAL AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, 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 BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW. THE ENDS OF THE LONGITUDINAL DISTRIBUTION REINFORCEMENT SHALL BE NOT MORE THAN 3" AND NOT LESS THAN 1½" FROM THE ENDS OF THE BRIDGE UNIT.
     - 4.2.2. 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 OUTSIDE CORNER.
     - 4.2.3. PLACEMENT OF REINFORCEMENT FOR PRECAST WINGWALLS AND HEADWALLS - THE COVER OF CONCRETE OVER THE LONGITUDINAL AND TRANSVERSE REINFORCEMENT SHALL BE 2" MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 1½" NOR MORE THAN 3". REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC, OR A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, 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 FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
     - 4.2.4. PLACEMENT OF REINFORCMENT FOR PRECAST FOUNDATION UNITS - THE COVER OF CONCRETE OVER THE BOTTOM REINFORCEMENT SHALL BE 3 INCHES MINIMUM. THE COVER OF CONCRETE FOR ALL OTHER REINFORCEMENT SHALL BE 2 INCHES MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 2 INCHES NOR MORE THAN 3 INCHES. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC OR A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, 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 FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
   - 4.3. LAPS, WELDS, SPACING
     - 4.3.1. 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 FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.10.8.2.5B AND 5.10.8.5.2. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.10.8.2.5A AND 5.10.8.5.1. THE OVERLAP OF WELDED WIRE FABRIC SHALL BE MEASURED BETWEEN THE OUTER-MOST LONGITUDINAL WIRES OF EACH FABRIC SHEET. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.10.8.2.1 FOR SPLICES OTHER THAN TENSION SPLICES, THE OVERLAP SHALL BE A MINIMUM OF 1'-0" FOR WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS. THE SPACING CENTER TO CENTER OF THE CIRCUMFERENTIAL WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL DISTRIBUTION STEEL FOR EITHER LINE OF REINFORCING IN THE TOP SLAB SHALL BE NOT MORE THAN 1'-4".
     - 4.3.2. LAPS, WELDS, AND SPACING FOR PRECAST WINGWALLS, HEADWALLS AND FOUNDATIONS - SPLICES IN THE REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.10.8.2.5B AND 5.10.8.5.2. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.10.8.2.5A AND 5.10.8.5.1. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.10.8.2.1. THE SPACING CENTER-TO-CENTER OF THE WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 8".
   - 4.4. 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:
     - 4.4.1. STEAM CURING - THE PRECAST ELEMENTS MAY BE LOW-PRESSURE STEAM CURED BY A SYSTEM THAT WILL MAINTAIN A MOIST ATMOSPHERE.
     - 4.4.2. WATER CURING - THE PRECAST ELEMENTS MAY BE WATER CURED BY ANY METHOD THAT WILL KEEP THE SECTIONS MOIST.
     - 4.4.3. MEMBRANE CURING - A SEALING MEMBRANE CONFORMING TO THE REQUIREMENTS OF ASTM SPECIFICATION C309 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 APPLICATION OF THE COMPOUNDS AND SHALL BE DAMP WHEN THE COMPOUND IS APPLIED.
   - 4.5. STORAGE, HANDLING & DELIVERY
     - 4.5.1. STORAGE - PRECAST CONCRETE BRIDGE ELEMENTS SHALL BE LIFTED AND STORED IN "AS-CAST" POSITION. PRECAST CONCRETE HEADWALL AND WINGWALL UNITS ARE CAST, STORED AND SHIPPED IN A FLAT POSITION. THE PRECAST ELEMENTS SHALL BE STORED IN SUCH A MANNER TO PREVENT CRACKING OR DAMAGE. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE. THE UNITS SHALL NOT BE MOVED UNTIL THE CONCRETE COMPRESSIVE STRENGTH HAS REACHED A MINIMUM OF 2500 PSI (3000 PSI FOR SPANS >48 FEET), AND THEY SHALL NOT BE STORED IN AN UPRIGHT POSITION.
     - 4.5.2. HANDLING - HANDLING DEVICES SHALL BE PERMITTED IN EACH PRECAST ELEMENT FOR THE PURPOSE OF HANDLING AND SETTING. SPREADER BEAMS MAY BE REQUIRED FOR THE LIFTING OF PRECAST CONCRETE BRIDGE ELEMENTS TO PRECLUDE DAMAGE FROM BENDING OR TORSION FORCES.
     - 4.5.3. DELIVERY - PRECAST CONCRETE ELEMENTS MUST NOT BE SHIPPED UNTIL THE CONCRETE HAS ATTAINED THE SPECIFIED DESIGN COMPRESSIVE STRENGTH, OR AS DIRECTED BY THE DESIGN ENGINEER. PRECAST CONCRETE ELEMENTS MAY BE UNLOADED AND PLACED ON THE GROUND AT THE SITE UNTIL INSTALLED. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE.
   - 4.6. QUALITY ASSURANCE - THE PRECASTER SHALL DEMONSTRATE ADHERENCE TO THE STANDARDS SET FORTH IN THE NPCA QUALITY CONTROL MANUAL. THE PRECASTER SHALL MEET EITHER SECTION 4.6.1 OR 4.6.2
     - 4.6.1. CERTIFICATION - THE PRECASTER SHALL BE CERTIFIED BY THE PRECAST/PRESTRESSED CONCRETE INSTITUTE PLANT CERTIFICATION PROGRAM OR THE NATIONAL PRECAST CONCRETE ASSOCIATION'S PLANT CERTIFICATION PROGRAM PRIOR TO AND DURING PRODUCTION OF THE PRODUCTS COVERED BY THIS SPECIFICATION.
     - 4.6.2. QUALIFICATIONS, TESTING AND INSPECTION
       - 4.6.2.1. THE PRECASTER SHALL HAVE BEEN IN THE BUSINESS OF PRODUCING PRECAST CONCRETE PRODUCTS SIMILAR TO THOSE SPECIFIED FOR A MINIMUM OF THREE YEARS. HE SHALL MAINTAIN A PERMANENT QUALITY CONTROL DEPARTMENT OR RETAIN AN INDEPENDENT TESTING AGENCY ON A CONTINUING BASIS. THE AGENCY SHALL ISSUE A REPORT, CERTIFIED BY A LICENSED ENGINEER, DETAILING THE ABILITY OF THE PRECASTER TO PRODUCE QUALITY PRODUCTS CONSISTENT WITH INDUSTRY STANDARDS.
       - 4.6.2.2. THE PRECASTER SHALL SHOW THAT THE FOLLOWING TESTS ARE PERFORMED IN ACCORDANCE WITH THE ASTM STANDARDS INDICATED. TESTS SHALL BE PERFORMED AS INDICATED IN SECTION 6 OF THESE SPECIFICATIONS.
         - 4.6.2.2.1. AIR CONTENT: C231 OR C173
         - 4.6.2.2.2. COMPRESSIVE STRENGTH: C31,C39,C497
       - 4.6.2.3. THE PRECASTER SHALL PROVIDE DOCUMENTATION DEMONSTRATING COMPLIANCE WITH THIS SECTION TO CONTECH® ENGINEERED SOLUTIONS AT REGULAR INTERVALS OR UPON REQUEST.
       - 4.6.2.4. THE OWNER MAY PLACE AN INSPECTOR IN THE PLANT WHEN THE PRODUCTS COVERED BY THIS SPECIFICATION ARE BEING MANUFACTURED.
     - 4.6.3. DOCUMENTATION - THE PRECASTER SHALL SUBMIT PRECAST PRODUCTION REPORTS TO CONTECH® ENGINEERED SOLUTIONS AS REQUIRED.

5. PERMISSIBLE VARIATIONS
   - 5.1. BRIDGE UNITS
     - 5.1.1. INTERNAL DIMENSIONS - THE INTERNAL DIMENSION SHALL VARY NOT MORE THAN 1% FROM THE DESIGN DIMENSIONS NOR MORE THAN 1½" WHICHEVER IS LESS.
     - 5.1.2. SLAB AND WALL THICKNESS - THE SLAB AND WALL THICKNESS SHALL NOT BE LESS THAN THAT SHOWN IN THE DESIGN BY MORE THAN ¼". A THICKNESS MORE THAN THAT REQUIRED IN THE DESIGN SHALL NOT BE CAUSE FOR REJECTION.
     - 5.1.3. LENGTH OF OPPOSITE SURFACES - VARIATIONS IN LAYING LENGTHS OF TWO OPPOSITE SURFACES OF THE BRIDGE UNIT SHALL NOT BE MORE THAN ½" IN ANY SECTION, EXCEPT WHERE BEVELED ENDS FOR LAYING OF CURVES ARE SPECIFIED BY THE PURCHASER.
     - 5.1.4. LENGTH OF SECTION - THE UNDERRUN IN LENGTH OF A SECTION SHALL NOT BE MORE THAN ½" IN ANY BRIDGE UNIT.
     - 5.1.5. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½" FOR THE OUTSIDE CIRCUMFERENTIAL STEEL OR BE LESS THAN 1" FOR THE INSIDE CIRCUMFERENTIAL STEEL AS MEASURED TO THE EXTERNAL OR INTERNAL SURFACE OF THE BRIDGE. THESE TOLERANCES OR COVER REQUIREMENTS DO NOT APPLY TO MATING SURFACES OF THE JOINTS.
     - 5.1.6. AREA OF REINFORCEMENT - THE AREAS OF STEEL REINFORCEMENT SHALL BE THE DESIGN STEEL AREAS AS SHOWN IN THE MANUFACTURER'S SHOP DRAWINGS. STEEL AREAS GREATER THAN THOSE REQUIRED SHALL NOT BE CAUSE FOR REJECTION. THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCEMENT SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCEMENT.
   - 5.2. WINGWALLS & HEADWALLS
     - 5.2.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ¼".
     - 5.2.2. LENGTH/HEIGHT OF WALL SECTIONS - THE LENGTH AND HEIGHT OF THE WALL SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
     - 5.2.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½", IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½".
     - 5.2.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING. STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.
   - 5.3. FOUNDATION UNITS
     - 5.3.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
     - 5.3.2. LENGTH/ HEIGHT/WIDTH OF FOUNDATION SECTIONS - THE LENGTH, HEIGHT AND WIDTH OF THE FOUNDATION UNITS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
     - 5.3.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½".
     - 5.3.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING. STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.

6. TESTING/ INSPECTION
   - 6.1. TESTING
     - 6.1.1. TYPE OF TEST SPECIMEN - CONCRETE COMPRESSIVE STRENGTH SHALL BE DETERMINED FROM COMPRESSION TESTS MADE ON CYLINDERS OR CORES. FOR CYLINDER TESTING, A MINIMUM OF 4 CYLINDERS SHALL BE TAKEN FOR EACH BRIDGE ELEMENT. FOR CORE TESTING, A MINIMUM OF 2 CORES SHALL BE TAKEN FOR EACH BRIDGE ELEMENT. EACH ELEMENT SHALL BE CONSIDERED SEPARATELY FOR THE PURPOSE OF TESTING AND ACCEPTANCE.
     - 6.1.2. COMPRESSION TESTING - CYLINDERS SHALL BE MADE AND TESTED AS PRESCRIBED BY THE ASTM C39 SPECIFICATION. CYLINDERS SHALL BE CURED IN THE SAME ENVIRONMENT AS THE BRIDGE ELEMENTS. CORES SHALL BE OBTAINED AND TESTED FOR COMPRESSIVE STRENGTH FROM EACH ELEMENT IN ACCORDANCE WITH THE PROVISIONS OF THE ASTM C42 SPECIFICATION.
     - 6.1.3. 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, AND NO CYLINDER TESTED HAS A COMPRESSIVE STRENGTH LESS THAN 90% OF THE REQUIRED CONCRETE STRENGTH, THEN THE ELEMENT SHALL BE ACCEPTED. WHEN THE COMPRESSIVE STRENGTH OF THE CYLINDERS TESTED DOES NOT CONFORM TO THESE ACCEPTANCE CRITERIA, THE ACCEPTABILITY OF THE ELEMENT MAY BE DETERMINED AS DESCRIBED IN SECTION 6.1.4, BELOW.
     - 6.1.4. ACCEPTABILITY OF CORE TESTS - THE COMPRESSIVE STRENGTH OF THE CONCRETE IN A BRIDGE ELEMENT IS ACCEPTABLE WHEN EACH CORE TEST STRENGTH IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH. WHEN THE COMPRESSIVE STRENGTH OF A CORE TESTED IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN 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 BRIDGE ELEMENT IS ACCEPTABLE.
       - 6.1.4.1. 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.
       - 6.1.4.2. 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 USE.
       - 6.1.4.3. TEST EQUIPMENT - EVERY MANUFACTURER FURNISHING PRECAST ELEMENTS UNDER THIS SPECIFICATION SHALL FURNISH ALL FACILITIES AND PERSONNEL NECESSARY TO CARRY OUT THE TEST REQUIRED.
   - 6.2. INSPECTION - THE QUALITY OF MATERIALS, THE PROCESS OF MANUFACTURE, AND THE FINISHED PRECAST ELEMENTS SHALL BE SUBJECT TO INSPECTION BY THE PURCHASER.

7. 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 WITH A SMOOTH INTERIOR FREE OF APPRECIABLE IRREGULARITIES, ALL COMPATIBLE WITH THE PERMISSIBLE VARIATIONS IN SECTION 5, ABOVE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

8. WORKMANSHIP/ FINISH
   THE BRIDGE UNITS, WINGWALLS, HEADWALLS AND FOUNDATION UNITS SHALL BE SUBSTANTIALLY FREE OF FRACTURES. THE ENDS OF THE BRIDGE UNITS SHALL BE NORMAL TO THE WALLS AND CENTERLINE OF THE BRIDGE SECTION, WITHIN THE LIMITS OF THE VARIATIONS GIVEN IN SECTION 5, ABOVE, EXCEPT WHERE BEVELED ENDS ARE SPECIFIED. THE FACES OF THE WINGWALLS AND HEADWALLS SHALL BE PARALLEL TO EACH OTHER, WITHIN THE LIMITS OF VARIATIONS GIVEN IN SECTION 5, ABOVE. THE SURFACE OF THE PRECAST ELEMENTS SHALL 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.

9. 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.

10. REJECTION
    THE PRECAST ELEMENTS SHALL BE SUBJECT TO REJECTION ON ACCOUNT OF ANY OF THE SPECIFICATION REQUIREMENTS. INDIVIDUAL PRECAST ELEMENTS MAY BE REJECTED BECAUSE OF ANY OF THE FOLLOWING:
    - 10.1. FRACTURES OR CRACKS PASSING THROUGH THE WALL, EXCEPT FOR A SINGLE END CRACK THAT DOES NOT EXCEED ONE HALF THE THICKNESS OF THE WALL.
    - 10.2. DEFECTS THAT INDICATE PROPORTIONING, MIXING, AND MOLDING NOT IN COMPLIANCE WITH SECTION 4 OF THESE SPECIFICATIONS.
    - 10.3. HONEYCOMBED OR OPEN TEXTURE.
    - 10.4. DAMAGED ENDS, WHERE SUCH DAMAGE WOULD PREVENT MAKING A SATISFACTORY JOINT.

APPROVED

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CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CON/SPAN BRIDGE SYSTEMS

FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S25 OF S26		

SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS (CONT'D)

ADDENDUM NO. 1

11. MARKING
EACH BRIDGE UNIT SHALL BE CLEARLY MARKED BY WATERPROOF PAINT. THE FOLLOWING SHALL BE SHOWN ON THE INSIDE OF THE VERTICAL LEG OF THE BRIDGE SECTION:
BRIDGE SPAN x BRIDGE RISE
DATE OF MANUFACTURE
NAME OR TRADEMARK OF THE MANUFACTURER

12. INSTALLATION PREPARATION
TO ENSURE CORRECT INSTALLATION OF THE PRECAST CONCRETE BRIDGE SYSTEM, CARE AND CAUTION MUST BE EXERCISED IN FORMING THE SUPPORT AREAS FOR BRIDGE UNITS, HEADWALL, AND WINGWALL ELEMENTS. EXERCISING SPECIAL CARE WILL FACILITATE THE RAPID INSTALLATION OF THE PRECAST COMPONENTS.

12.1. FOOTINGS
DO NOT OVER EXCAVATE FOUNDATIONS UNLESS DIRECTED BY SITE SOIL ENGINEER TO REMOVE UNSUITABLE SOIL.

THE SITE SOILS ENGINEER SHALL CERTIFY THAT THE BEARING CAPACITY MEETS OR EXCEEDS THE FOOTING DESIGN REQUIREMENTS, PRIOR TO THE CONTRACTOR POURING OF THE FOOTINGS.

THE BRIDGE UNITS AND WINGWALLS SHALL BE INSTALLED ON EITHER PRECAST OR CAST-IN-PLACE CONCRETE FOOTINGS. THE SIZE AND ELEVATION OF THE FOOTINGS SHALL BE AS DESIGNED BY THE ENGINEER. A KEYWAY SHALL BE FORMED IN THE TOP SURFACE OF THE BRIDGE FOOTING AS SPECIFIED ON THE PLANS. NO KEYWAY IS REQUIRED IN THE WINGWALL FOOTINGS, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

THE FOOTINGS SHALL BE GIVEN A SMOOTH FLOAT FINISH AND SHALL REACH A COMPRESSIVE STRENGTH OF 2,000 PSI BEFORE PLACEMENT OF THE BRIDGE AND WINGWALL ELEMENTS. BACKFILLING SHALL NOT BEGIN UNTIL THE FOOTING HAS REACHED THE FULL DESIGN COMPRESSIVE STRENGTH.

THE FOOTING SURFACE SHALL BE CONSTRUCTED IN ACCORDANCE WITH GRADES SHOWN ON THE PLANS. WHEN TESTED WITH A 10'-0" STRAIGHT EDGE, THE SURFACE SHALL NOT VARY MORE THAN ¼" IN 10'-0".

IF A PRECAST CONCRETE FOOTING IS USED, THE CONTRACTOR SHALL PREPARE A 4" THICK BASE LAYER OF COMPACTED GRANULAR MATERIAL THE FULL WIDTH OF THE FOOTING PRIOR TO PLACING THE PRECAST FOOTING.

THE FOUNDATIONS FOR PRECAST CONCRETE BRIDGE ELEMENTS AND WINGWALLS MUST BE CONNECTED BY REINFORCEMENT TO FORM ONE MONOLITHIC BODY. EXPANSION JOINTS SHALL NOT BE USED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF THE FOUNDATIONS PER THE PLANS AND SPECIFICATIONS.

13. INSTALLATION

13.1. GENERAL - THE INSTALLATION OF THE PRECAST CONCRETE ELEMENTS SHALL BE AS EXPLAINED IN THE PUBLICATION CON/SPAN BRIDGE SYSTEMS INSTALLATION HANDBOOK.

13.1.1. LIFTING - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT A CRANE OF THE CORRECT LIFTING CAPACITY IS AVAILABLE TO HANDLE THE PRECAST CONCRETE UNITS. THIS CAN BE ACCOMPLISHED BY USING THE WEIGHTS GIVEN FOR THE PRECAST CONCRETE COMPONENTS AND BY DETERMINING THE LIFTING REACH FOR EACH CRANE UNIT. SITE CONDITIONS MUST BE CHECKED WELL IN ADVANCE OF SHIPPING TO ENSURE PROPER CRANE LOCATION AND TO AVOID ANY LIFTING RESTRICTIONS. THE LIFT ANCHORS OR HOLES PROVIDED IN EACH UNIT ARE THE ONLY MEANS TO BE USED TO LIFT THE ELEMENTS. THE PRECAST CONCRETE ELEMENTS MUST NOT BE SUPPORTED OR RAISED BY OTHER MEANS THAN THOSE GIVEN IN THE MANUALS AND DRAWINGS WITHOUT WRITTEN APPROVAL FROM CONTECH® ENGINEERED SOLUTIONS.

13.1.2. CONSTRUCTION EQUIPMENT WEIGHT RESTRICTIONS - IN NO CASE SHALL EQUIPMENT OPERATING IN EXCESS OF THE DESIGN LOAD (HL-93) BE PERMITTED OVER THE BRIDGE UNITS UNLESS APPROVED BY CONTECH® ENGINEERED SOLUTIONS.

13.1.2.1. IN THE IMMEDIATE AREA OF THE BRIDGE UNITS, THE FOLLOWING RESTRICTIONS FOR THE USE OF HEAVY CONSTRUCTION MACHINERY DURING BACKFILLING OPERATIONS APPLY:

- NO CONSTRUCTION EQUIPMENT SHALL CROSS THE BARE PRECAST CONCRETE BRIDGE UNIT.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 4" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 10 TONS MAY CROSS THE BRIDGE.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 1'-0" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 30 TONS MAY CROSS THE BRIDGE.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED THE DESIGN COVER, OR 2'-0" MINIMUM, OVER THE CROWN OF THE PRECAST CONCRETE BRIDGE, CONSTRUCTION EQUIPMENT WITHIN THE DESIGN LOAD LIMITS FOR THE ROAD MAY CROSS THE PRECAST CONCRETE BRIDGE.

13.2. LEVELING PAD/SHIMS - THE BRIDGE UNITS AND WINGWALLS SHALL BE SET ON HARDBOARD SHIMS CONFORMING TO ASTM D1037 OR PLASTIC SHIMS (DAYTON SUPERIOR P-80, P-81 OR APPROVED EQUAL) MEASURING 5" x 5", MINIMUM, UNLESS SHOWN OTHERWISE ON THE PLANS. A MINIMUM GAP OF ½" SHALL BE PROVIDED BETWEEN THE FOOTING AND THE BOTTOM OF THE BRIDGE'S VERTICAL LEGS OR THE BOTTOM OF THE WINGWALL. ALSO, A SUPPLY OF ¼", ½" AND ¾" THICK HARDBOARD OR PLASTIC SHIMS FOR VARIOUS SHIMMING PURPOSES SHALL BE ON SITE.

13.3. PLACEMENT OF BRIDGE UNITS - THE BRIDGE UNITS SHALL BE PLACED AS SHOWN ON THE ENGINEER'S PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

13.4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE STRUCTURE SPAN DURING ALL PHASES OF INSTALLATION. DUE TO THE ARCH SHAPE, BRIDGE ELEMENTS WILL TEND TO SPREAD UNDER SELF-WEIGHT. IT IS IMPERATIVE THAT ANY LATERAL SPREADING OF THE BRIDGE ELEMENTS BE AVOIDED DURING AND AFTER THEIR PLACEMENT. GENERALLY, HORIZONTAL CABLE TIES OR TIE RODS ARE SHIPPED IN THE LARGER BRIDGE ELEMENTS TO ASSIST IN PREVENTING THIS SPREADING. CABLE TIES/TIE RODS SHALL NOT BE REMOVED UNTIL BRIDGE UNITS ARE GROUTED AND GROUT HAS CURED. IT IS RECOMMENDED THAT TEMPORARY HARDWOOD BLOCKS BE USED IN CONJUNCTION WITH THE CABLE TIES/TIE RODS TO MAINTAIN SPAN. IF, HOWEVER, DUE TO SITE RESTRICTIONS, THESE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO PLACEMENT OF THE BRIDGE ELEMENTS, THE CONTRACTOR MUST NOTIFY CONTECH (MANUFACTURER) AND REQUEST A SUGGESTED INSTALLATION PROCEDURE.

IN ADDITION, IF THE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO SETTING ARCH UNITS, THE FOLLOWING QUALITY CONTROL PROCEDURE MUST BE FOLLOWED:
1) FIND "MEASURED SPAN" UPON ARCH UNIT'S DELIVERY TO SITE, PRIOR TO LIFTING FROM TRUCK AND REMOVING CABLE TIES/TIE RODS. "MEASURED SPAN" SHALL BE THE AVERAGE OF (3) SPAN MEASUREMENTS ALONG THE LAY LENGTH OF THE ARCH UNIT.
2) AFTER SETTING OF BRIDGE UNIT ON THE FOUNDATION, VERIFY THE SPAN. THIS "INSTALLED SPAN MEASUREMENT" SHALL NOT EXCEED THE MAXIMUM OF:
A) THE NOMINAL SPAN +½" OR
B) THE "MEASURED SPAN"
IF THE "INSTALLED SPAN MEASUREMENT" EXCEEDS THIS AMOUNT, THE ARCH UNIT SHALL BE LIFTED AND RE-SET UNTIL THE "INSTALLED SPAN MEASUREMENT" MEETS THE LIMITS.

13.5. PLACEMENT OF WINGWALLS, HEADWALLS AND FOUNDATION UNITS - THE WINGWALLS, HEADWALLS AND FOUNDATIONS SHALL BE PLACED AS SHOWN ON THE PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE.

13.6. JOINT PROTECTION AND SUBSURFACE DRAINAGE

13.6.1. EXTERNAL PROTECTION OF JOINTS - THE BUTT JOINT MADE BY TWO ADJOINING BRIDGE UNITS SHALL BE COVERED WITH A ⅞" x 1⅜" PREFORMED BITUMINOUS JOINT SEALANT AND A MINIMUM OF A 9" WIDE JOINT WRAP. THE SURFACE SHALL BE FREE OF DIRT BEFORE APPLYING THE JOINT MATERIAL. A PRIMER COMPATIBLE WITH THE JOINT WRAP TO BE USED SHALL BE APPLIED FOR A MINIMUM WIDTH OF 9" ON EACH SIDE OF THE JOINT. THE EXTERNAL WRAP SHALL BE CS212 BY CONCRETE SEALANTS INC., EZ-WRAP RUBBER BY PRESS-SEAL GASKET 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 TOP OF THE BRIDGE AND TO THE OPPOSITE BRIDGE SECTION LEG. ANY LAPS THAT RESULT IN THE JOINT WRAP SHALL BE A MINIMUM OF 6" LONG WITH THE OVERLAP RUNNING DOWNHILL.

13.6.2. 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 PRECAST WINGWALLS ARE USED, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE WINGWALL SHALL BE SEALED WITH A 2'-0" STRIP OF FILTER FABRIC. ALSO, IF LIFT HOLES ARE FORMED IN THE BRIDGE UNITS, THEY SHALL BE PRIMED AND COVERED WITH A 9" x 9" SQUARE OF JOINT WRAP.

13.6.3. DURING THE BACKFILLING OPERATION, CARE SHALL BE TAKEN TO KEEP THE JOINT WRAP IN ITS PROPER LOCATION OVER THE JOINT.

13.6.4. SUBSOIL DRAINAGE SHALL BE AS DIRECTED BY THE ENGINEER.

13.7. GROUTING

13.7.1. GROUTING SHALL NOT BE PERFORMED WHEN TEMPERATURES ARE EXPECTED TO GO BELOW 35° FOR A PERIOD OF 72 HOURS. GROUTING SHOULD BE COMPLETED AS SOON AS PRACTICAL AFTER PRECAST ARCHES HAVE BEEN INSTALLED. FILL THE BRIDGE-FOUNDATION KEYWAY WITH CEMENT GROUT (PORTLAND CEMENT AND WATER OR CEMENT MORTAR COMPOSED OF PORTLAND CEMENT, SAND AND WATER) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI. VIBRATE AS REQUIRED TO ENSURE THAT THE ENTIRE KEY AROUND THE BRIDGE ELEMENT IS COMPLETELY FILLED. IF BRIDGE ELEMENTS HAVE BEEN SET WITH TEMPORARY TIES (CABLES, BARS, ETC.) GROUT MUST ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI BEFORE TIES MAY BE REMOVED.

13.7.2. ALL GROUT SHALL HAVE A MAXIMUM AGGREGATE SIZE OF ¼".

13.7.3. LIFTING AND ERECTION ANCHOR RECESSES SHALL BE FILLED WITH GROUT.

13.7.4. AFTER GROUT HAS REACHED ITS DESIGN STRENGTH THE TEMPORARY HARDWOOD WEDGES SHALL BE REMOVED AND THEIR HOLES FILLED WITH GROUT.

13.8. BACKFILL

13.8.1. DO NOT PERFORM BACKFILLING DURING WET OR FREEZING WEATHER.

13.8.2. NO BACKFILL SHALL BE PLACED AGAINST ANY STRUCTURAL ELEMENTS UNTIL THEY HAVE BEEN APPROVED BY THE ENGINEER.

13.8.3. BACKFILL SHALL BE CONSIDERED AS ALL REPLACED EXCAVATION AND NEW EMBANKMENT ADJACENT TO THE PRECAST CONCRETE ELEMENTS. THE PROJECT CONSTRUCTION AND MATERIAL SPECIFICATIONS, WHICH INCLUDE THE SPECIFICATIONS FOR EXCAVATION FOR STRUCTURES AND ROADWAY EXCAVATION AND EMBANKMENT CONSTRUCTION, SHALL APPLY EXCEPT AS MODIFIED IN THIS SECTION.

13.8.4. BACKFILL ZONES:

- IN-SITU SOIL
- ZONE A: CONSTRUCTED EMBANKMENT OR OVERFILL.
- ZONE B: FILL THAT IS DIRECTLY ASSOCIATED WITH PRECAST CONCRETE BRIDGE INSTALLATION.
- ZONE C: ROAD STRUCTURE.

13.8.5. REQUIRED BACKFILL PROPERTIES

13.8.5.1. IN-SITU SOIL - NATURAL GROUND IS TO BE SUFFICIENTLY STABLE TO ALLOW EFFECTIVE SUPPORT TO THE PRECAST CONCRETE BRIDGE UNITS. AS A GUIDE, THE EXISTING NATURAL GROUND SHOULD BE OF SIMILAR QUALITY AND DENSITY TO ZONE B MATERIAL FOR MINIMUM LATERAL DIMENSION OF ONE BRIDGE SPAN OUTSIDE OF THE BRIDGE FOOTING.

13.8.5.2. ZONE A - ZONE A REQUIRES FILL MATERIAL WITH SPECIFICATIONS AND COMPACTING PROCEDURES EQUAL TO THAT FOR NORMAL ROAD EMBANKMENTS.

13.8.5.3. ZONE B - GENERALLY, SOILS SHALL BE REASONABLY FREE OF ORGANIC MATTER, AND, NEAR CONCRETE SURFACES, FREE OF STONES LARGER THAN 3" IN DIAMETER. SEE CHARTS FOR DETAILED DESCRIPTIONS OF ACCEPTABLE SOILS.

13.8.5.4. ZONE C - ZONE C IS THE ROAD SECTION OF GRAVEL, ASPHALT OR CONCRETE BUILT IN COMPLIANCE WITH LOCAL ENGINEERING PRACTICES.

13.8.5.5. GEOTECHNICAL ENGINEER SHALL REVIEW GRADATIONS OF ALL INTERFACING MATERIALS AND, IF NECESSARY, RECOMMEND GEOTEXTILE FILTER FABRIC (PROVIDED BY CONTRACTOR)

13.8.6. PLACING AND COMPACTING BACKFILL
DUMPING FOR BACKFILLING IS NOT ALLOWED ANY NEARER THAN 3'-0" FROM THE BRIDGE LEG.

THE FILL MUST BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE MAXIMUM DIFFERENCE IN THE SURFACE LEVELS OF THE FILL ON OPPOSITE SIDES OF THE BRIDGE MUST NOT EXCEED 2'-0".

THE FILL BEHIND WINGWALLS MUST BE PLACED AT THE SAME TIME AS THAT OF THE BRIDGE FILL. IT MUST BE PLACED IN PROGRESSIVELY PLACED HORIZONTAL LAYERS NOT EXCEEDING 8" PER LAYER.

THE BACKFILL OF ZONE B SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95% OF THE STANDARD PROCTOR, AS REQUIRED BY AASHTO T-99.

SOIL WITHIN 1'-0" OF CONCRETE SURFACES SHALL BE HAND-COMPACTED. ELSEWHERE, USE OF ROLLERS IS ACCEPTABLE. IF VIBRATING ROLLER-COMPACTORS ARE USED, THEY SHALL NOT BE STARTED OR STOPPED WITHIN ZONE B AND THE VIBRATION FREQUENCY SHOULD BE AT LEAST 30 REVOLUTIONS PER SECOND.

THE BACKFILL MATERIAL AND COMPACTING BEHIND WINGWALLS SHALL SATISFY THE CRITERIA FOR THE BRIDGE BACKFILL, ZONE B.

BACKFILL AGAINST A WATERPROOFED SURFACE SHALL BE PLACED CAREFULLY TO AVOID DAMAGE TO THE WATERPROOFING MATERIAL.

13.8.7. BRIDGE UNITS
FOR FILL HEIGHTS OVER 12 FEET (AS MEASURED FROM TOP CROWN OF BRIDGE TO FINISHED GRADE), NO BACKFILLING MAY BEGIN UNTIL A BACKFILL COMPACTION TESTING PLAN HAS BEEN COORDINATED WITH AND APPROVED BY CONTECH® ENGINEERED SOLUTIONS.

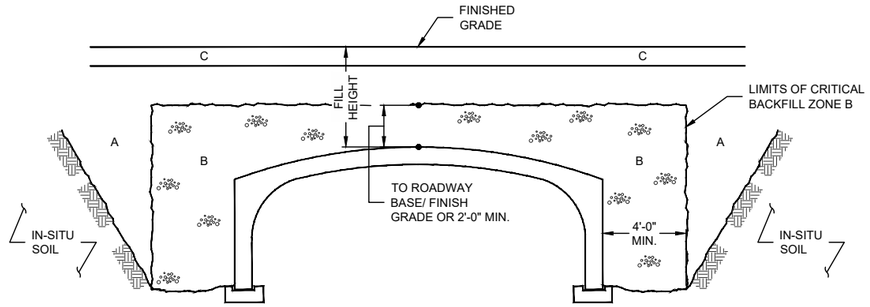
13.8.8. WINGWALLS
BACKFILL IN FRONT OF WINGWALLS SHALL BE CARRIED TO GROUND LINES SHOWN IN THE PLANS.

13.8.9. MONITORING
THE CONTRACTOR SHALL CHECK SETTLEMENTS AND HORIZONTAL DISPLACEMENT OF FOUNDATION TO ENSURE THAT THEY ARE WITHIN THE ALLOWABLE LIMIT PROVIDED BY THE ENGINEER. THESE MEASUREMENTS SHOULD GIVE AN INDICATION OF THE SETTLEMENTS AND DEFORMATIONS ALONG THE LENGTH OF THE FOUNDATIONS.

THE FIRST MEASUREMENT SHOULD TAKE PLACE AFTER THE ERECTION OF ALL PRECAST BRIDGE SYSTEM ELEMENTS, A SECOND AFTER COMPLETION OF BACKFILLING, AND A THIRD BEFORE OPENING OF THE BRIDGE TO TRAFFIC. FURTHER MEASUREMENTS MAY BE MADE ACCORDING TO LOCAL CONDITIONS.

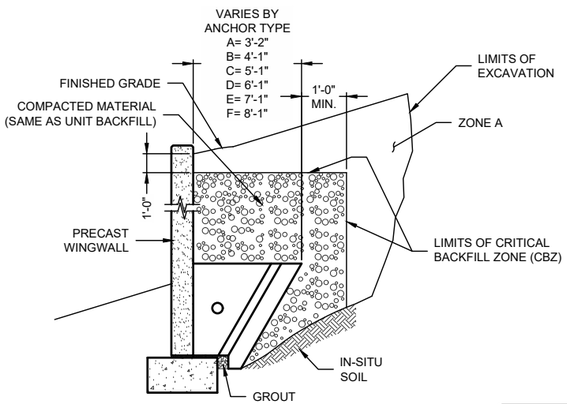
ACCEPTABLE SOILS FOR USE IN ZONE B BACKFILL

TYPICAL USCS MATERIALS	AASHTO GROUP	AASHTO SUBGROUP	PERCENT PASSING US SIEVE NO.			CHARACTER OF FRACTION PASSING NO. 40 SIEVE		SOIL DESRIPTION
			#10	#40	#200	LIQUID LIMIT	PLASTICITY INDEX	
GW, GP, SP	A1	A-1a	50 MAX	30 MAX	15 MAX		6 MAX	LARGELY GRAVEL BUT CAN INCLUDE SAND AND FINES
GM, SW, SP, SM		A-1b		50 MAX	25 MAX		6 MAX	GRAVELLY SAND OR GRADED SAND, MAY INCLUDE FINES
GM, SM, ML, SP, GP	A2	A-2-4			35 MAX	40 MAX	10 MAX	SANDS, GRAVELS WITH LOW-PLASTICITY SILT FINES
SC, GC, GM		A-2-5			35 MAX	41 MIN	10 MAX	SANDS, GRAVELS WITH PLASTIC SILT FINES
SP, SM, SW	A3			51 MIN	10 MAX		NON-PLASTIC	FINE SANDS
ML, SM, SC	A4				36 MIN	40 MAX	10 MAX	LOW-COMPRESSIBILTY SILTS

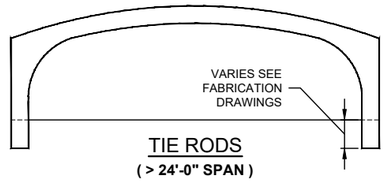


SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE ZONE B
≤ 24'-0"	≥ 12'-0"	A1, A3
≤ 24'-0"	< 12'-0"	A1, A2, A3, A4
> 24'-0"	ALL	A1, A3

BACKFILL REQUIREMENTS



WALL BACKFILL REQUIREMENTS



TIE RODS
(> 24'-0" SPAN)

APPROVED

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERING, PROFESSIONAL CORPORATION
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

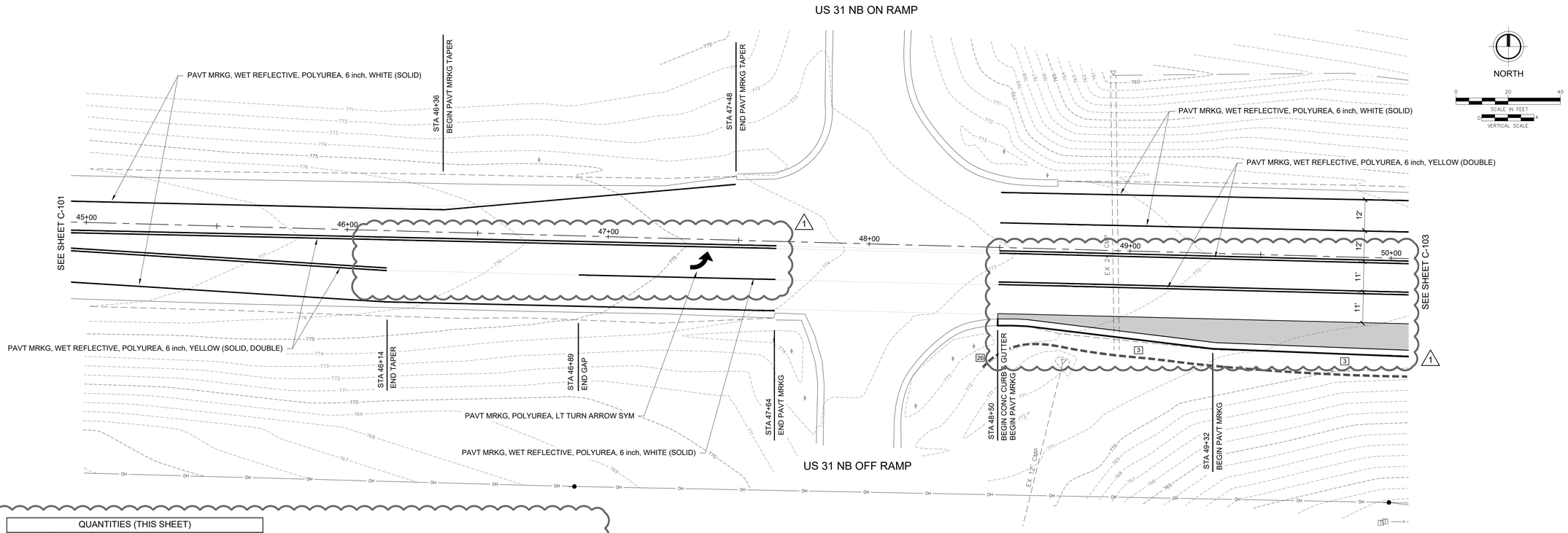
CON/SPAN BRIDGE SYSTEMS

FABRICATION DRAWING

LEWIS ADVENTURE FARM & ZOO BRIDGE
UNDER STONY LAKE ROAD (M-20)
OCEANA COUNTY, MICHIGAN

PROJECT No.:	SEQ. No.:	DATE:
781640	010	12/9/2025
DESIGNED: JDR	DRAWN: PJW	
CHECKED: EA	APPROVED: PAC	
SHEET NO.: S26 OF S26		

ADDENDUM NO. 1



QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	DESCRIPTION
~~110~~	~~SYD~~	~~COLD MILLING HMA SURFACE~~
172	SYD	HMA SURFACE, REM
11	FT	CURB AND GUTTER, REM
1.4	STA	TRENCHING
75	CYD	SUBBASE, CIP
150	SYD	AGGREGATE BASE, 6 inch
150	FT	CURB AND GUTTER, CONC, DET B2
50	TON	HMA, 4EML
~~0~~	~~TON~~	~~HAND PATCHING~~
150	SYD	GRASS RESTORATION

PAVT MRKG QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	DESCRIPTION
900	FT	PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, WHITE
1300	FT	PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, YELLOW
1	EA	PAVT MRKG, POLYUREA, LT TURN ARROW SYM
2000	FT	RECESSING PAVT MRKG, LONGIT
19	FT	RECESSING PAVT MRKG, TRANSV
2150	FT	PAVT MRKG, LONGIT, 6 INCH OR LESS WIDTH, REM

STONY LAKE RD / M-20
EX. BIT. PAVEMENT

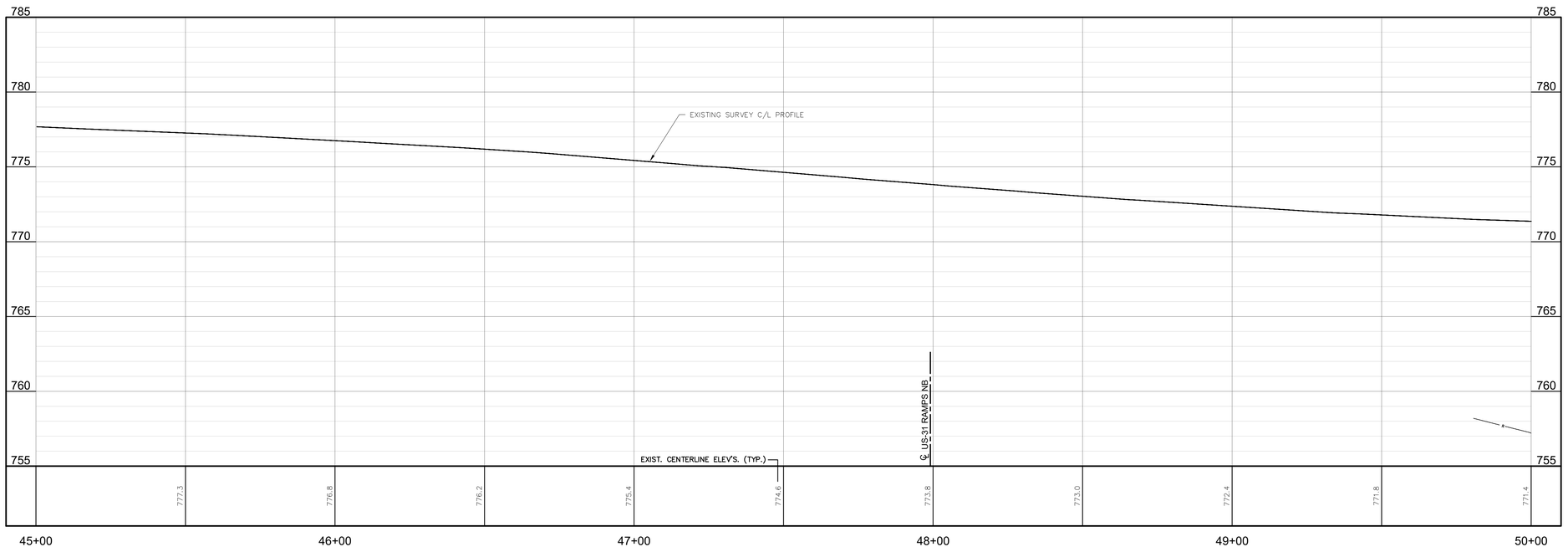
SESC LEGEND

- 3 PERMANENT / TEMPORARY SEEDING
- 26 SILT FENCE
- 33 MULCH BLANKET

NOTE: REFER TO MDOT STANDARD PLAN R-96 SERIES FOR KEYING.

LEGEND

- PROPOSED REMOVE & REPLACE HMA PAVEMENT
- PROPOSED CURB & GUTTER, CONC, DET B2
- ~~PROPOSED COLD MILL & HMA OVERLAY (2")~~



FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.
2960 Lucerne Drive SE
Grand Rapids, MI 49546
P: 616.977.1000
F: 616.977.1005

Addendum 1 12/17/2025 LBH

REVISION:

OCEANA COUNTY ROAD COMMISSION
SHELBY TOWNSHIP, OCEANA COUNTY, MICHIGAN
STRUCTURE 14792 STONY LAKE ROAD (M-20)

PLAN & PROFILE

DESIGN TEAM: PROJ MNGR: LBH; DESIGNED BY: RWT; DRAWN BY: PAD; CHECK BY:

DRAWING INFORMATION: 868960_C-102_PP 121625 peted

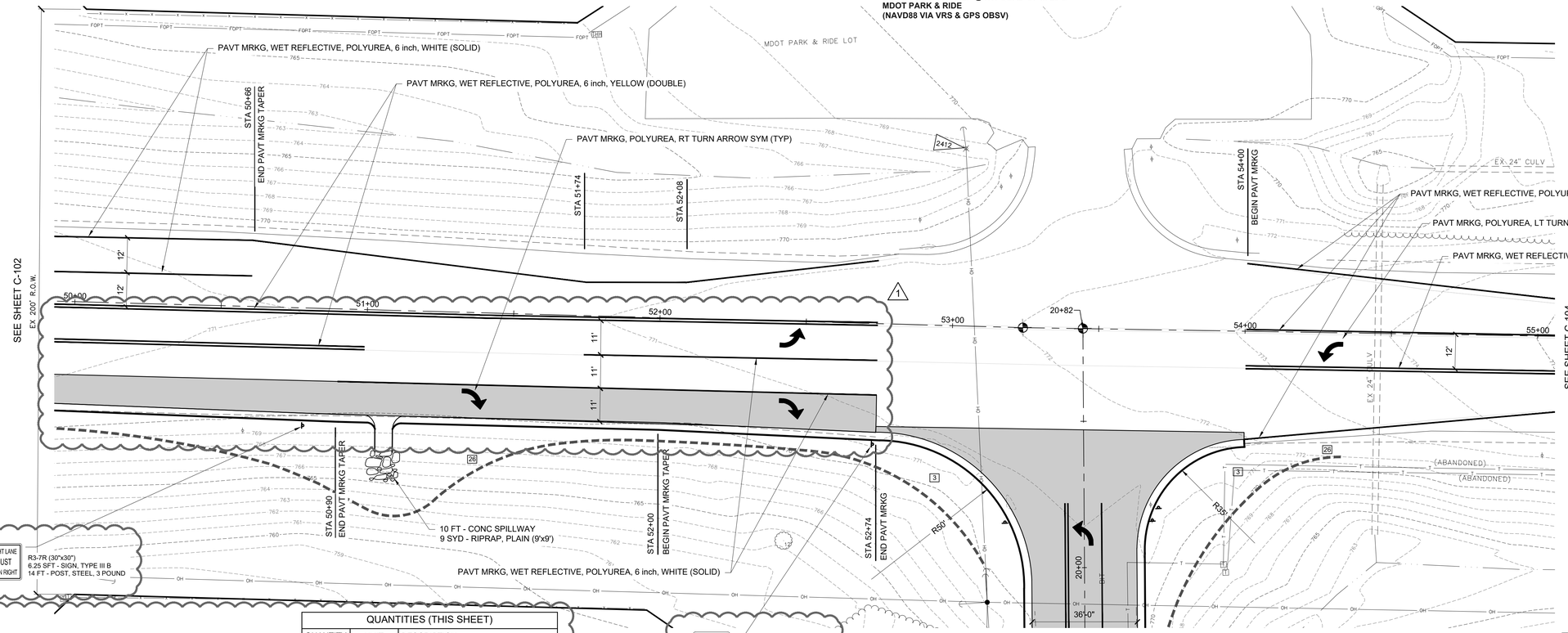
DECEMBER 2025

F&V PROJECT NO. 868960

C-102

ADDENDUM NO. 1

BM #2412 EL. 770.09'
BENCH TIE N FACE LP @ NW QUAD OF M-20 &
MDOT PARK & RIDE
(NAVD88 VIA VRS & GPS OBSV)



PAVT MRKG QUANTITIES (THIS SHEET)

QUANTITY	UNIT	DESCRIPTION
985	FT	PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, WHITE
985	FT	PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, YELLOW
2	EA	PAVT MRKG, POLYUREA, LT TURN ARROW SYM
2	EA	PAVT MRKG, POLYUREA, RT TURN ARROW SYM
1770	FT	RECESSING PAVT MRKG, LONGIT
76	FT	RECESSING PAVT MRKG, TRANSV
2100	FT	PAVT MRKG, LONGIT, 6 INCH OR LESS WIDTH, REM

QUANTITIES (THIS SHEET)

QUANTITY	UNIT	DESCRIPTION
~~100~~	~~SYD~~	~~COLD MILLING HMA SURFACE~~
462	SYD	HMA SURFACE, REM
2.8	STA	TRENCHING
200	CYD	SUBBASE, CIP
400	SYD	AGGREGATE BASE, 6 inch
274	FT	CURB AND GUTTER, CONC, DET B2
~~140~~	~~TON~~	~~HMA, 4EML~~
16	TON	HAND PATCHING
400	SYD	GRASS RESTORATION
100	SYD	MULCH BLANKET

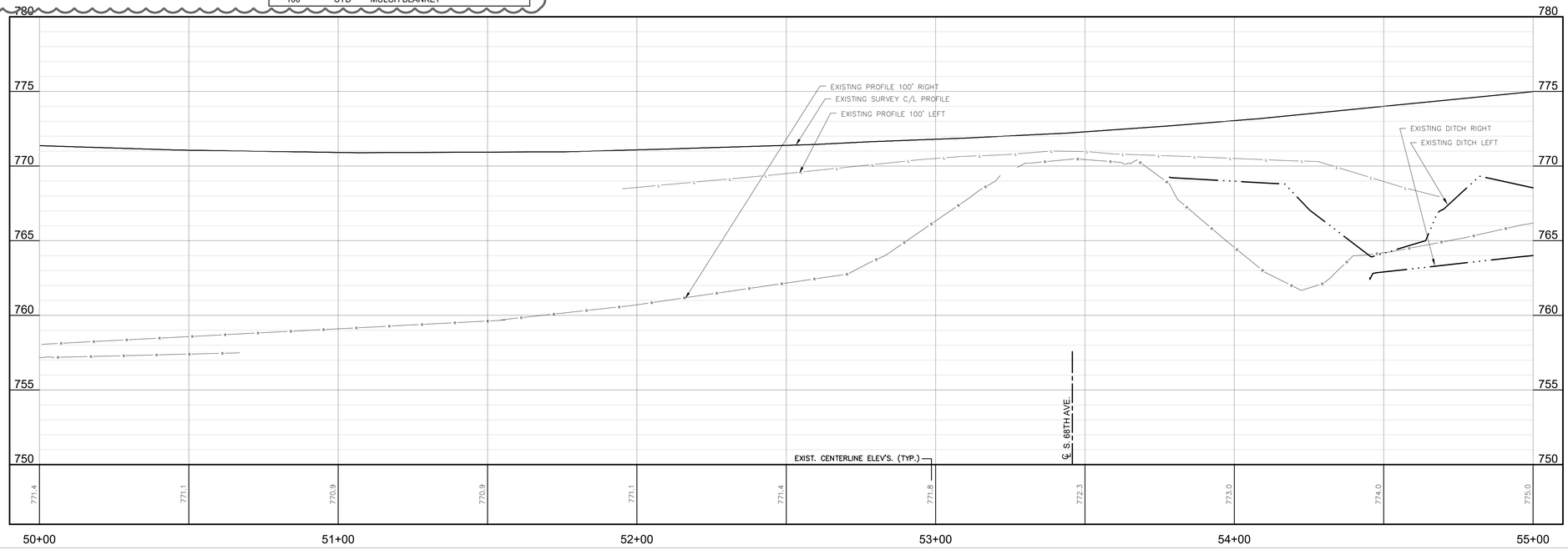
SESC LEGEND

- 3 PERMANENT / TEMPORARY SEEDING
- 26 SILT FENCE
- 33 MULCH BLANKET

NOTE: REFER TO MDOT STANDARD PLAN R-96 SERIES FOR KEYING.

LEGEND

- PROPOSED REMOVE & REPLACE HMA PAVEMENT
- PROPOSED REMOVE & REPLACE CONCRETE CURB & GUTTER
- ~~PROPOSED COLD MILL & HMA OVERLAY (2")~~



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Addendum 1 12/17/2025 LBH

REVISION:

OCEANA COUNTY ROAD COMMISSION
SHELBY TOWNSHIP, OCEANA COUNTY, MICHIGAN
STRUCTURE 14792 STONY LAKE ROAD (M-20)

PLAN & PROFILE

DESIGN TEAM:	PROJ MNGR: LBH DESIGNED BY: RWT DRAWN BY: PAD CHECK BY:

DRAWING INFORMATION:
868960_C-103_PP
121525 peted

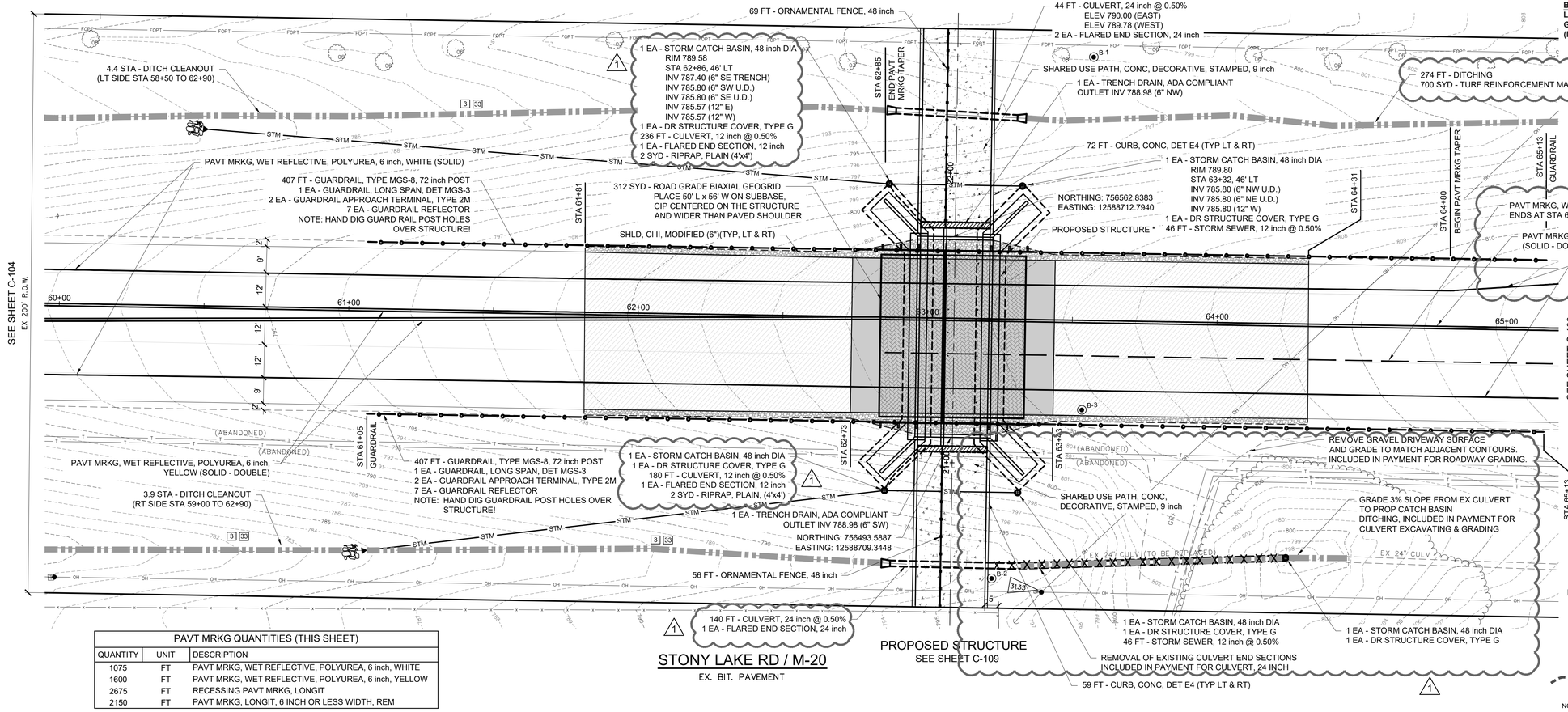
DECEMBER 2025

F&V PROJECT NO.
868960

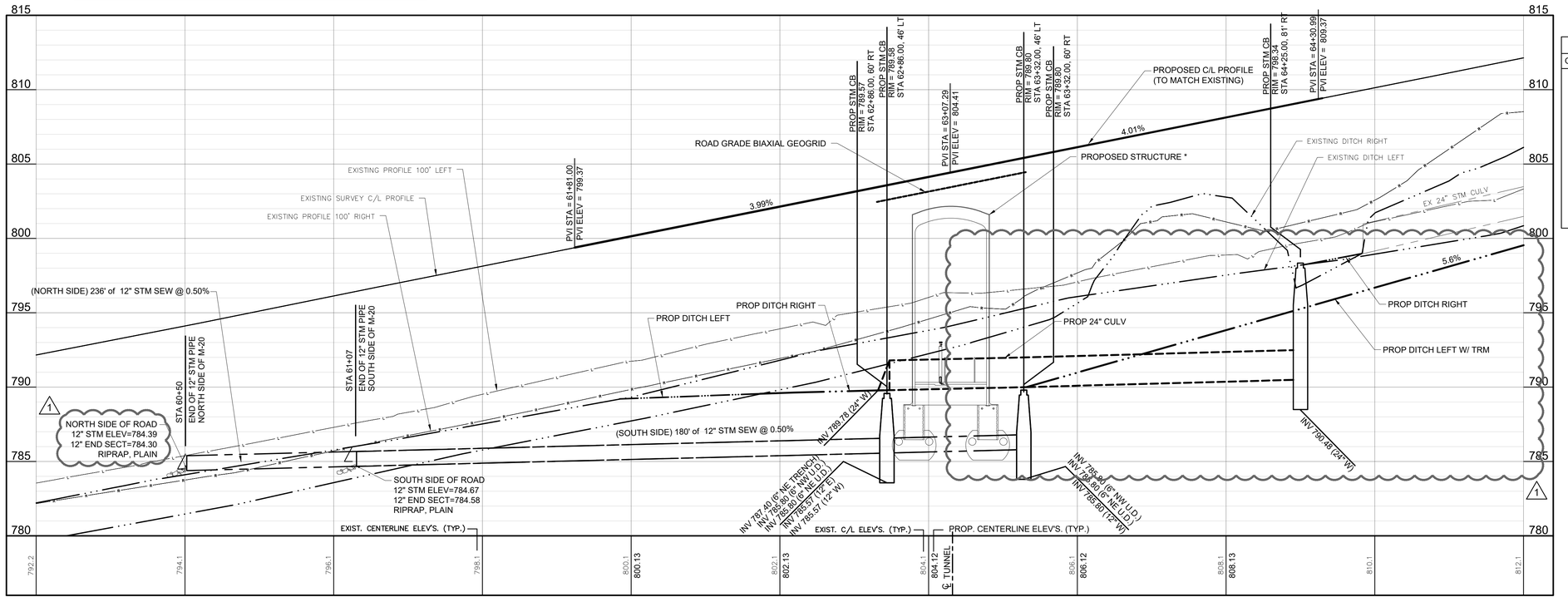
C-103

M:\Proj\867001-869000\868960 Oceana CRC- M20 Tunnel Lwrkl Forms 2024\Civil\Plns\868960_C-103_PP.dwg - plotted on 12/16/2025 10:25 AM

ADDENDUM NO. 1



PAVT MRKG QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	DESCRIPTION
1075	FT	PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, WHITE
1600	FT	PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, YELLOW
2675	FT	RECESSING PAVT MRKG, LONGIT
2150	FT	PAVT MRKG, LONGIT, 6 INCH OR LESS WIDTH, REM



QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	DESCRIPTION
1	LSUM	CULV, PRECAST ARCH EXCAVATING & GRADING
0.7	STA	ROADWAY GRADING
1100	SYD	COLD MILLING HMA SURFACE
460	SYD	HMA SURFACE, REM
450	SYD	AGGREGATE BASE, 8 inch
550	SYD	AGGREGATE BASE, 6 inch
300	CYD	SUBBASE, CIP
310	TON	HMA, 4EML
3200	SFT	SHARED USE PATH, CONC, DECORATIVE, STAMPED, 9 inch
65	TON	SHLD, CI II, MODIFIED
8400	SYD	GRASS RESTORATION
4200	SYD	MULCH BLANKET

NOTE: SEE PROFILE VIEW OF STA 20+50 TO STA 22+50 ON SHEET C-109

* STRUCTURE PRECAST CONCRETE WILL BE PROVIDED BY OTHERS AND INSTALLED BY THIS CONTRACT

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Addendum 1 12/17/2025 LBH

REVISION:

OCEANA COUNTY ROAD COMMISSION
SHELBY TOWNSHIP, OCEANA COUNTY, MICHIGAN
STRUCTURE 14792 STONY LAKE ROAD (M-20)
PLAN & PROFILE

DESIGN TEAM:	PROJ MNGR: LBH DESIGNED BY: RWT DRAWN BY: PAD CHECK BY:

DRAWING INFORMATION:
868960_C-105_PP
121625 peted

DECEMBER 2025

F&V PROJECT NO.
868960

C-105

M:\Proj\867001-869000\868960 Oceana CRC - M20 Tunnel Lwks Forms 2024\Civil\Plns\868960_C-105_PP.dwg -- plotted on 12/16/2025 10:37 AM

ADDENDUM NO. 1

BM #3132 EL. 807.10'
LAG BOLT W FACE PP, N SIDE M-20, 80' W OF MAIN DRIVE ENTRANCE TO LEWIS FARMS (NAVD88 VIA VRS & GPS OBSV)

DITCH CLEANOUT TO STA 66+06

STA 65+13 END GUARDRAIL

STA 65+80 END PAVT MRKG TAPER

STA 66+06

STA 67+10 BEGIN PAVT MRKG

PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, WHITE (SOLID)

PROP GUARDRAIL, SEE SHEET C-105 FOR PAY ITEMS AND QUANTITIES

SEE SHEET C-105

SEE SHEET C-107

EX 200' R.O.W.

EX 24" CULV

EX 24" STM

(ABANDONED)

PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, YELLOW (SOLID - DOUBLE)

PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, WHITE (SKIP)

65+00 66+00 67+00 68+00 69+00 70+00

17' 12' 12' 12' 8'

NORTH

0 20 40
SCALE IN FEET

0 4
VERTICAL SCALE

1

PAVT MRKG QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	DESCRIPTION
1025	FT	PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, WHITE
1000	FT	PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, YELLOW
2025	FT	RECESSING PAVT MRKG, LONGIT
2150	FT	PAVT MRKG, LONGIT, 6 INCH OR LESS WIDTH, REM

STONY LAKE RD / M-20
EX. BIT. PAVEMENT

LEGEND
PROPOSED DITCH CLEANOUT

SESC LEGEND
3 PERMANENT / TEMPORARY SEEDING
29 INLET PROTECTION FABRIC DROP (PROVIDE AT ALL CATCH BASINS)

NOTE: REFER TO MDOT STANDARD PLAN R-96 SERIES FOR KEYING.

EXISTING PROFILE 100' RIGHT
EXISTING SURVEY C/L PROFILE
EXISTING PROFILE 100' LEFT
EXISTING DITCH RIGHT
EXISTING DITCH LEFT
EX 24" STM

835 830 825 820 815 810 805 800

EXIST. CENTERLINE ELEV'S. (TYP.)

812.1 814.1 816.1 818.1 820.2 822.2 824.2 826.2 828.2 830.2 832.2

65+00 66+00 67+00 68+00 69+00 70+00

1

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Addendum 1 12/17/2025 LBH

REVISION:

OCEANA COUNTY ROAD COMMISSION
SHELBY TOWNSHIP, OCEANA COUNTY, MICHIGAN
STRUCTURE 14792 STONY LAKE ROAD (M-20)
PLAN & PROFILE

DESIGN TEAM:	PROJ MNGR: LBH DESIGNED BY: RWT DRAWN BY: PAD CHECK BY:

DRAWING INFORMATION:
868960_C-106_PP
121625 peted

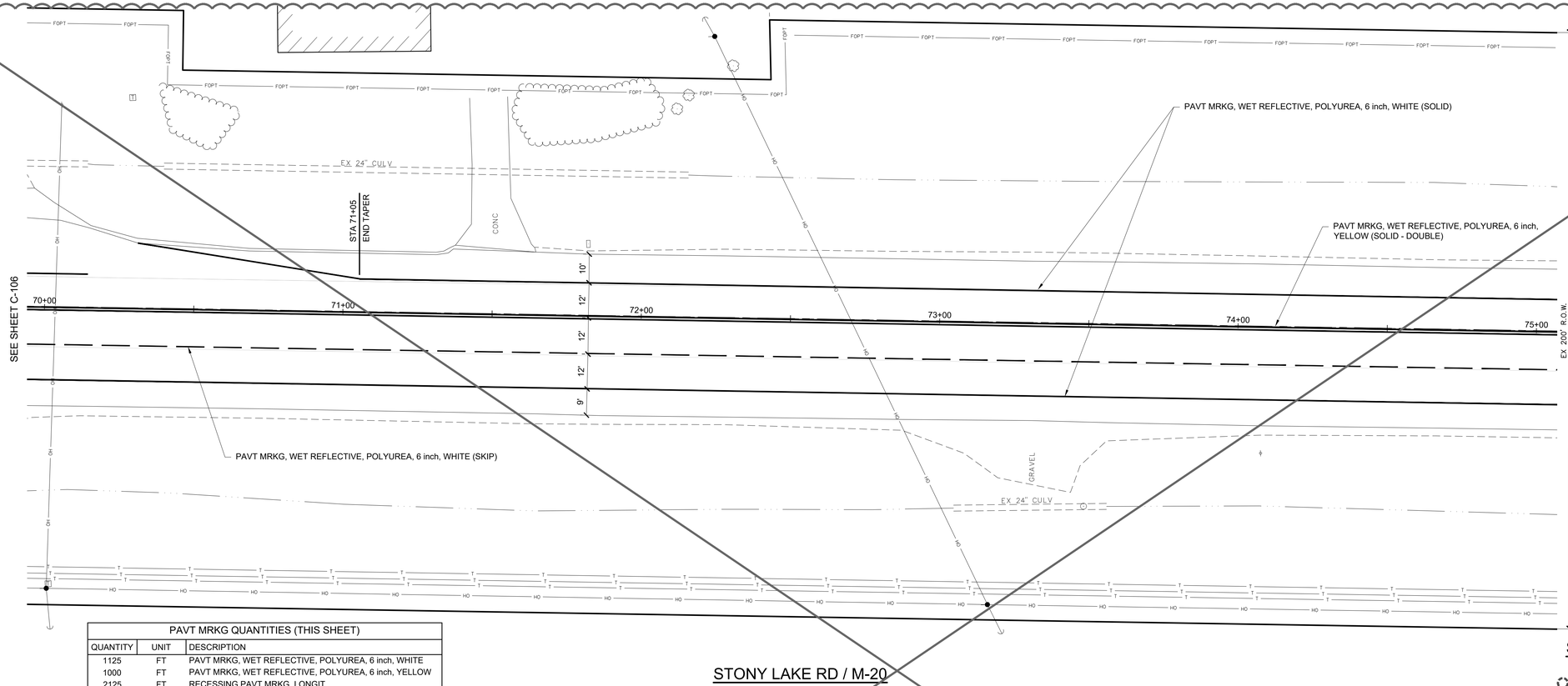
DECEMBER 2025

F&V PROJECT NO.
868960

C-106

M:\Proj\868700\-868900\868960 Oceana CRC - M20 Tunnel Lewis Farms 2024\Civil\Plan\868960_C-106_PP.dwg - plotted on 12/16/2025 11:15 AM

ADDENDUM NO. 1



NORTH

0 20 40
SCALE: 1" = 40' HORIZONTAL
0 2 4
VERTICAL SCALE

PAVT MRKG QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	DESCRIPTION
1125	FT	PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, WHITE
1000	FT	PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, YELLOW
2125	FT	RECESSING PAVT MRKG, LONGIT
2150	FT	PAVT MRKG, LONGIT, 6 INCH OR LESS WIDTH, REM

SESC LEGEND

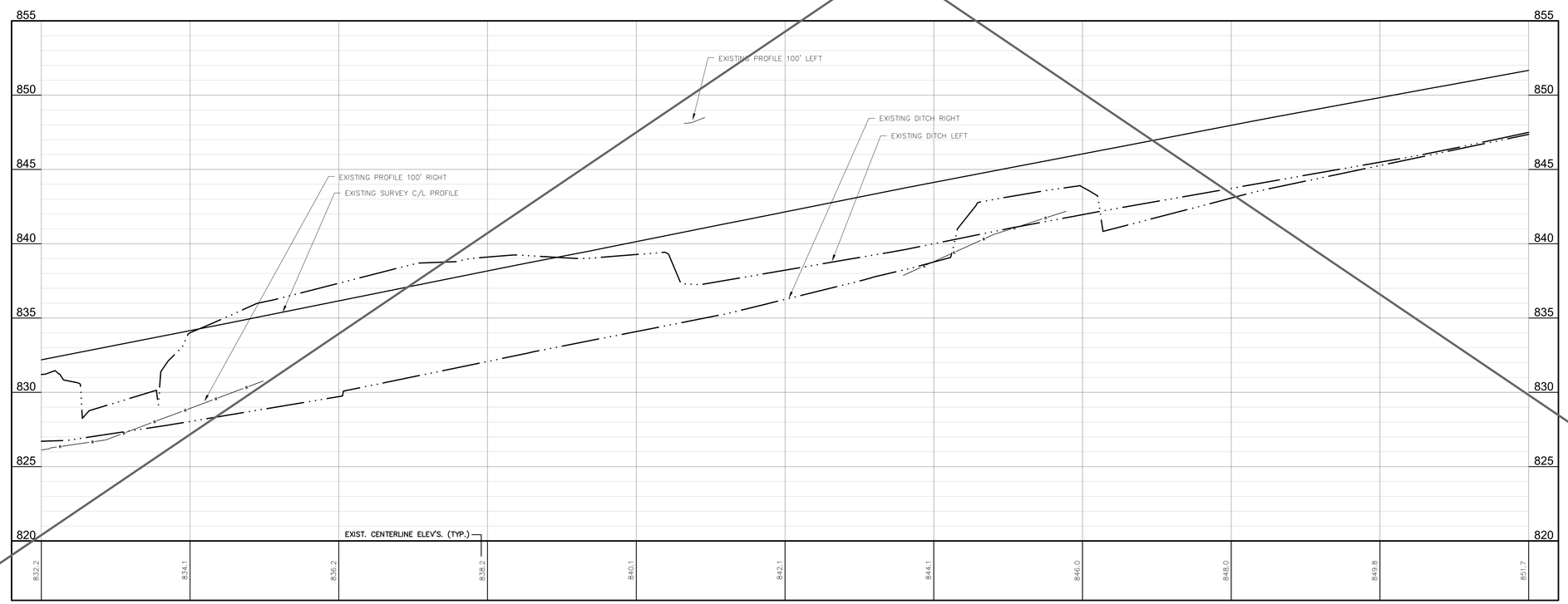
[3] PERMANENT / TEMPORARY SEEDING

[29] INLET PROTECTION FABRIC DROP (PROVIDE AT ALL CATCH BASINS)

NOTE: REFER TO MDOT STANDARD PLAN R-96 SERIES FOR KEYING.

STONY LAKE RD / M-20

EX. BIT. PAVEMENT



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Addendum 1 12/17/2025 LBH

REVISION:

OCEANA COUNTY ROAD COMMISSION
SHELBY TOWNSHIP, OCEANA COUNTY, MICHIGAN
STRUCTURE 14792 STONY LAKE ROAD (M-20)

PLAN & PROFILE

DESIGN TEAM:	PROJ MNGR:	LBH
	DESIGNED BY:	RWT
	DRAWN BY:	PAD
	CHECK BY:	

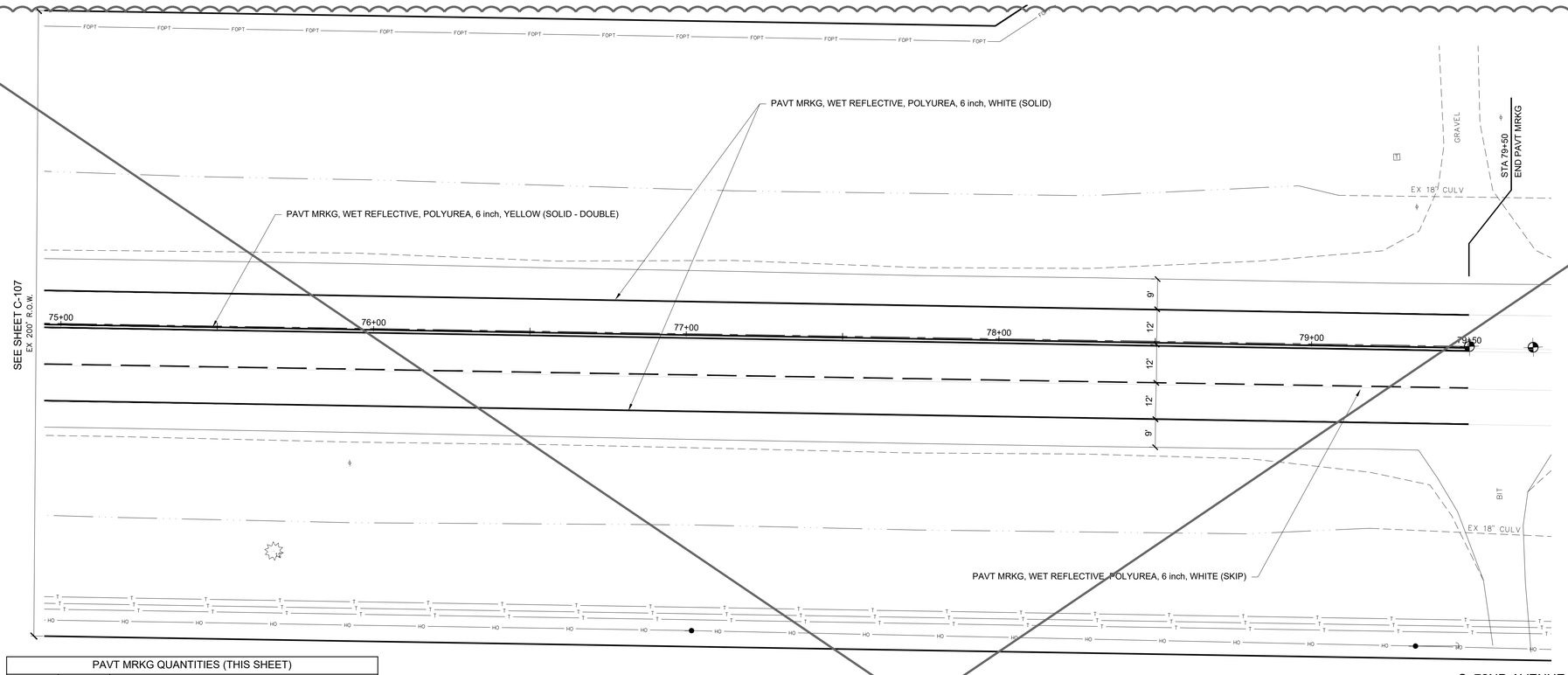
DRAWING INFORMATION:
868960_C-107_PP
121525 pdted

DECEMBER 2025

F&V PROJECT NO.
868960

C-107

ADDENDUM NO. 1

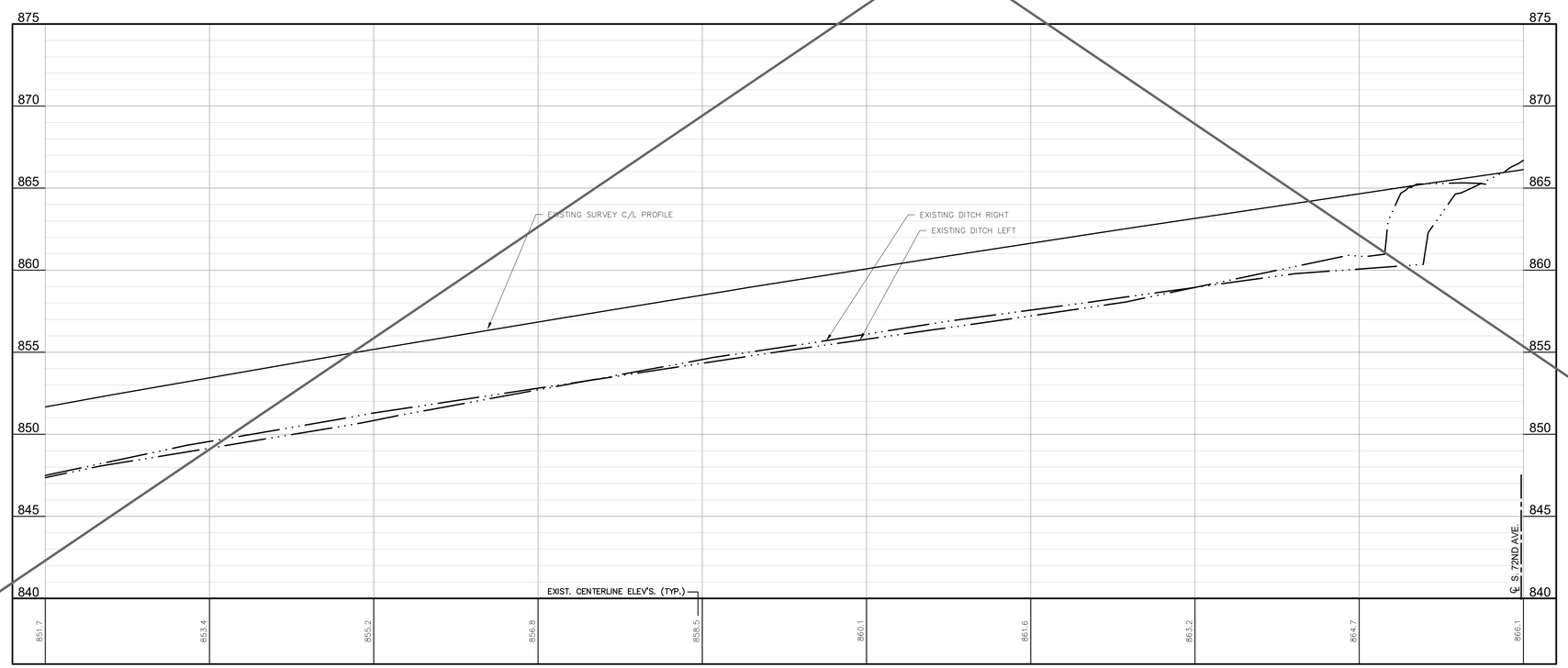


S. 72ND AVENUE

PAVT MRKG QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	DESCRIPTION
1025	FT	PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, WHITE
900	FT	PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, YELLOW
1925	FT	RECESSING PAVT MRKG, LONGIT
2150	FT	PAVT MRKG, LONGIT, 6 INCH OR LESS WIDTH, REM

STONY LAKE RD / M-20

EX. BIT. PAVEMENT



SESC LEGEND

3 PERMANENT / TEMPORARY SEEDING

20 INLET PROTECTION FABRIC DROP (PROVIDE AT ALL CATCH BASINS)

NOTE: REFER TO MDOT STANDARD PLAN R-96 SERIES FOR KEYING.

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Addendum 1 12/17/2025 LBH

REVISION:

OCEANA COUNTY ROAD COMMISSION
SHELBY TOWNSHIP, OCEANA COUNTY, MICHIGAN
STRUCTURE 14792 STONY LAKE ROAD (M-20)

PLAN & PROFILE

DESIGN TEAM:	PROJ MNGR:	LBH
	DESIGNED BY:	RWT
	DRAWN BY:	PAD
	CHECK BY:	

DRAWING INFORMATION:
868960_C-108_PP
121525 peted

DECEMBER 2025

F&V PROJECT NO.
868960

C-108

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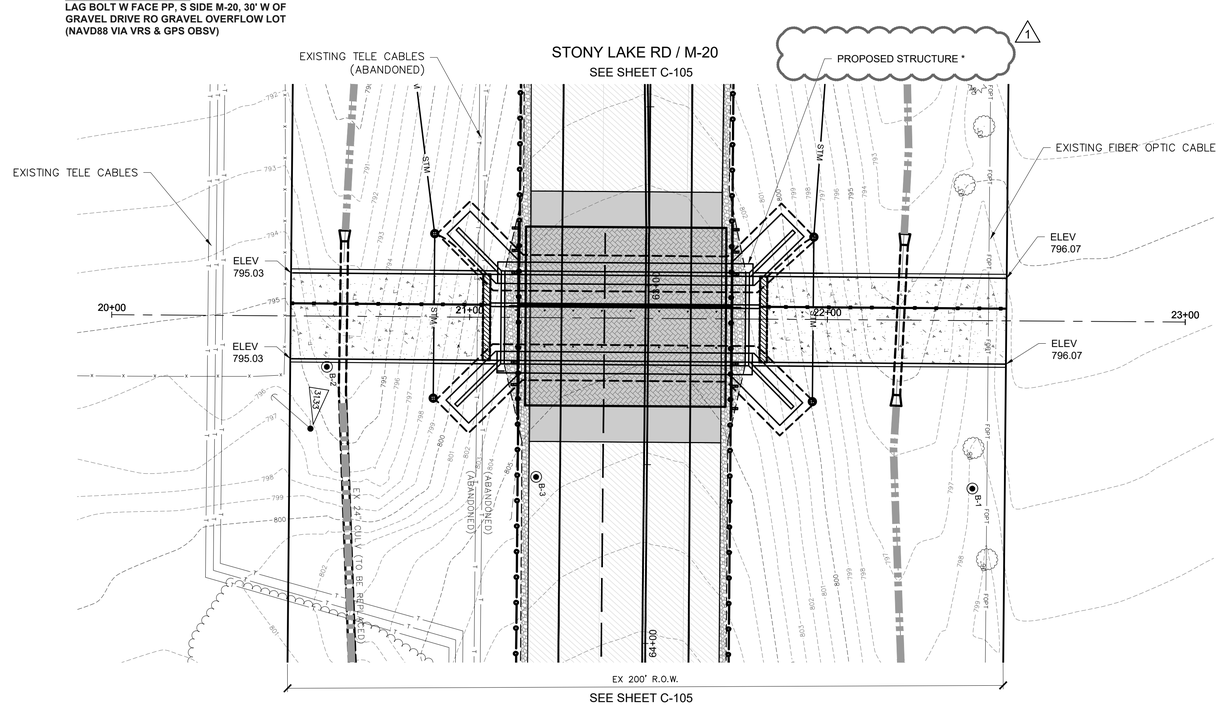
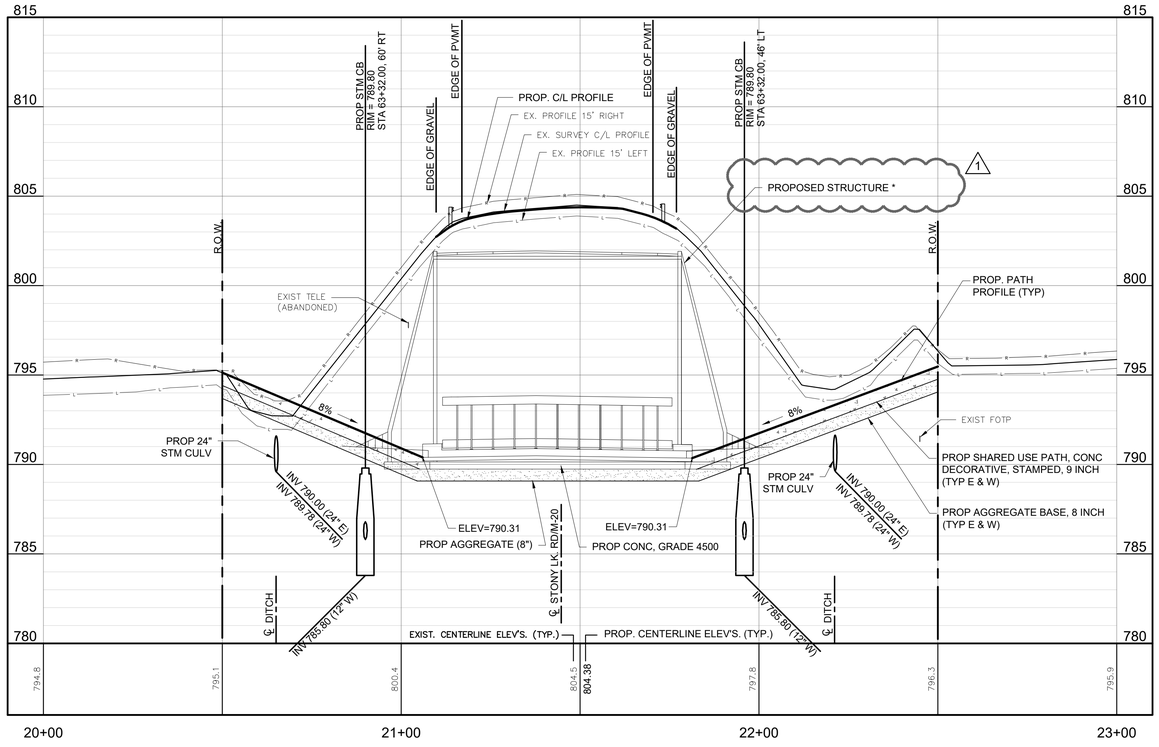
ADDENDUM NO. 1

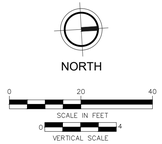
BM #3133 EL. 798.15'
LAG BOLT W FACE PP, S SIDE M-20, 30' W OF GRAVEL DRIVE RO GRAVEL OVERFLOW LOT
(NAVD88 VIA VRS & GPS OBSV)



PROPOSED STRUCTURE ON STONY LAKE RD / M-20

EX. BIT. PAVEMENT





LEGEND

- PROPOSED REMOVE & REPLACE HMA PAVEMENT
- PROPOSED COLD MILL & HMA OVERLAY (2")
- PROPOSED DITCH CLEANOUT

SESC LEGEND

- 3 PERMANENT / TEMPORARY SEEDING
- 26 SILT FENCE
- 29 INLET PROTECTION FABRIC DROP (PROVIDE AT ALL CATCH BASINS)
- 33 MULCH BLANKET

NOTE: REFER TO MDOT STANDARD PLAN R-96 SERIES FOR KEYING.

* STRUCTURE PRECAST CONCRETE WILL BE PROVIDED BY OTHERS AND INSTALLED BY THIS CONTRACT

1

FLEIS&VANDENBRINK
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Addendum 1 12/17/2025 LBH

REVISION:

OCEANA COUNTY ROAD COMMISSION
SHELBY TOWNSHIP, OCEANA COUNTY, MICHIGAN
STRUCTURE 14792 STONY LAKE ROAD (M-20)

PLAN & PROFILE

DESIGN TEAM:	PROJ MNGR:	LBH
	DESIGNED BY:	RWT
	DRAWN BY:	PAD
	CHECK BY:	

DRAWING INFORMATION:
868960_C-109_PP
121525 peted

DECEMBER 2025

F&V PROJECT NO.
868960

C-109

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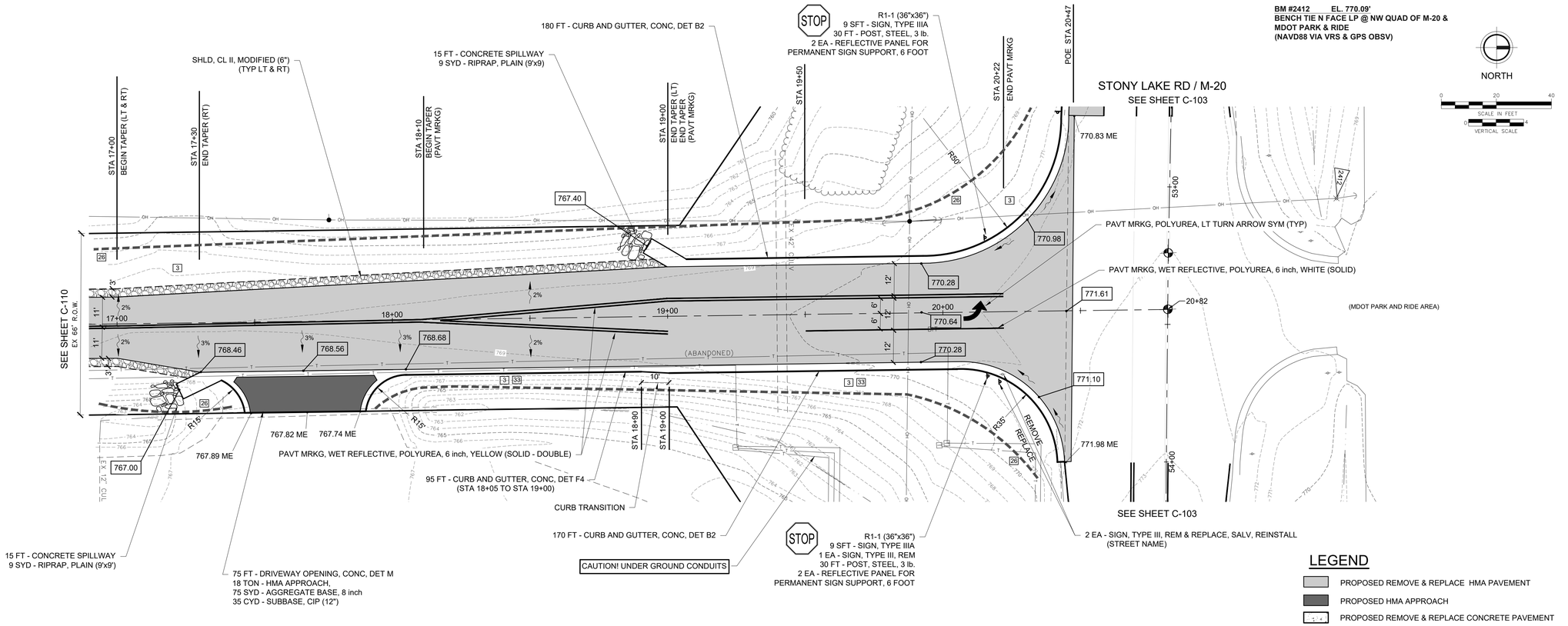
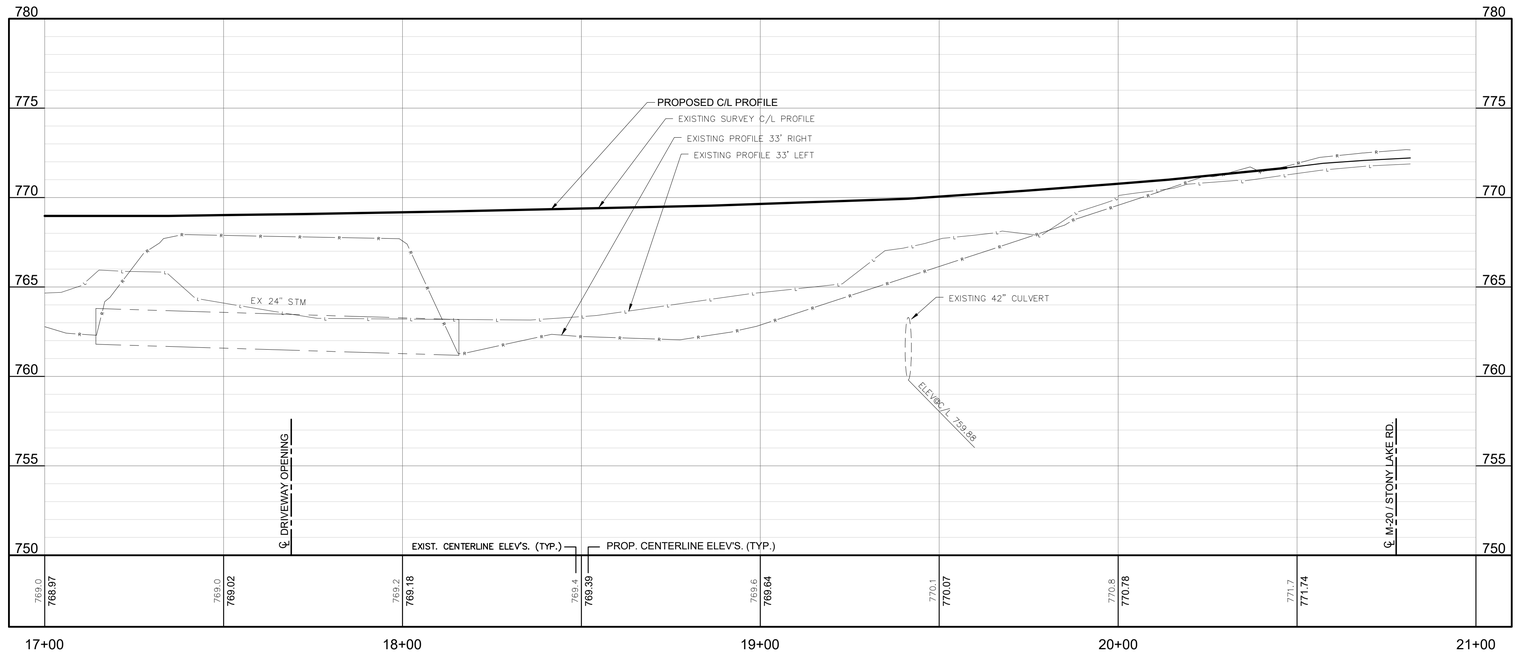


68TH AVENUE
EX. BIT. PAVEMENT



LEGEND

- PROPOSED REMOVE & REPLACE HMA PAVEMENT
- PROPOSED HMA APPROACH
- PROPOSED REMOVE & REPLACE CONCRETE PAVEMENT
- PROPOSED CONCRETE CURB & GUTTER
- PROPOSED SHOULDER, CL II, MODIFIED

SESC LEGEND

- [3] PERMANENT / TEMPORARY SEEDING
- [26] SILT FENCE
- [33] MULCH BLANKET

NOTE: REFER TO MDOT STANDARD PLAN R-96 SERIES FOR KEYING.

GRADING LEGEND

- FLOW DIRECTION
- EOM EXTENSION THROUGH INTERSECTION
- 620.50 PROP. SPOT ELEVATION
- 620.50 EX. SPOT ELEVATION

QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	DESCRIPTION
3.5	STA	ROADWAY GRADING
1200	SYD	HMA SURFACE, REM
190	FT	CURB AND GUTTER, REM
1500	SYD	AGGREGATE BASE, 8 inch
850	CYD	SUBBASE, CIP
320	TON	HMA, 4EML
40	TON	SHLD, CL II, MODIFIED
1700	SYD	GRASS RESTORATION
600	SYD	MULCH BLANKET

1

PAVT MRKG QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	DESCRIPTION
72	FT	PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, WHITE
850	FT	PAVT MRKG, WET REFLECTIVE, POLYUREA, 6 inch, YELLOW
922	FT	RECESSING PAVT MRKG, LONGIT
19	SFT	RECESSING PAVT MRKG, TRANSV
1	EA	PAVT MRKG, POLYUREA, LT TURN ARROW SYM

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.
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Grand Rapids, MI 49546
P: 616.977.1000
F: 616.977.1005

Addendum 1 12/17/2025 LBH

REVISION:

OCEANA COUNTY ROAD COMMISSION
SHELBY TOWNSHIP, OCEANA COUNTY, MICHIGAN
STRUCTURE 14792 STONY LAKE ROAD (M-20)
PLAN & PROFILE

DESIGN TEAM:	PROJ MNGR: LBH DESIGNED BY: RWT DRAWN BY: PAD CHECK BY:

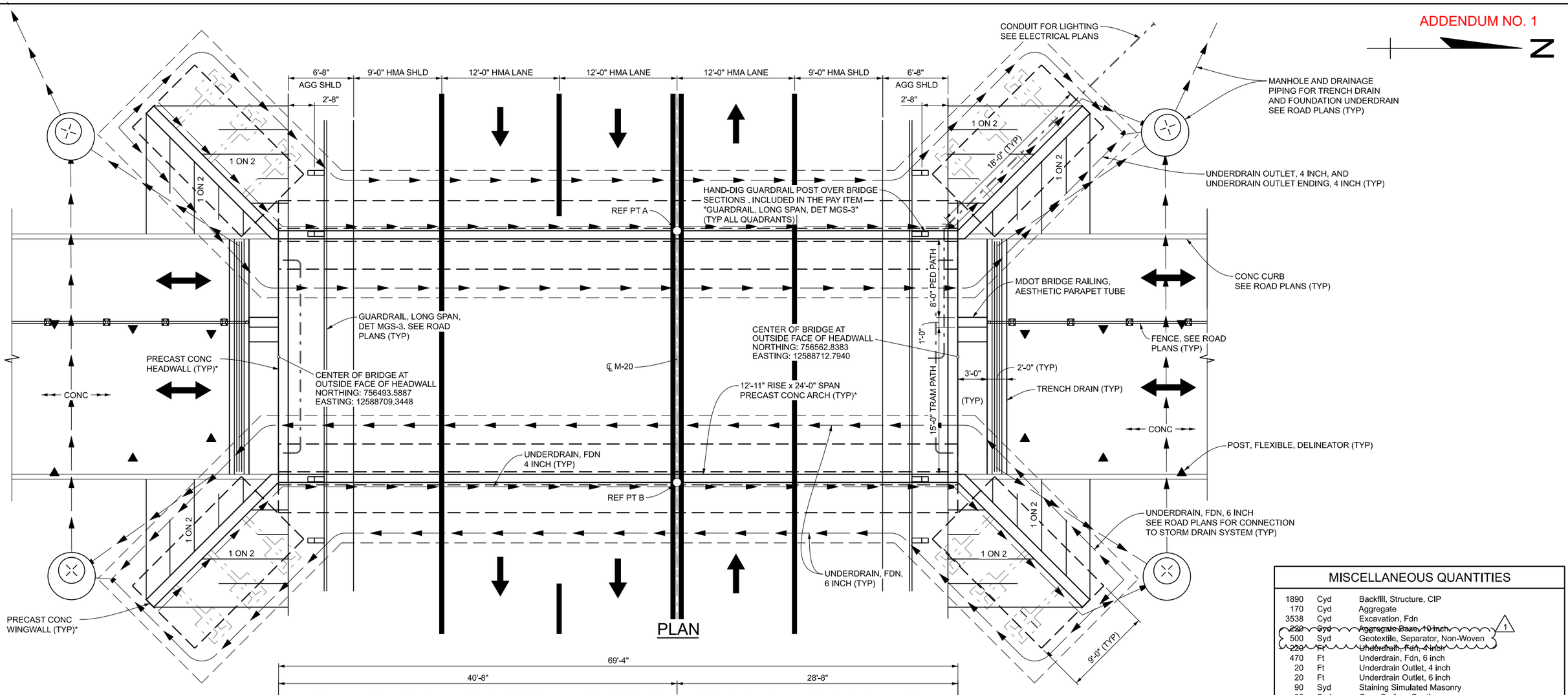
DRAWING INFORMATION:
868960_C-111_PP
121225 peted

DECEMBER 2025

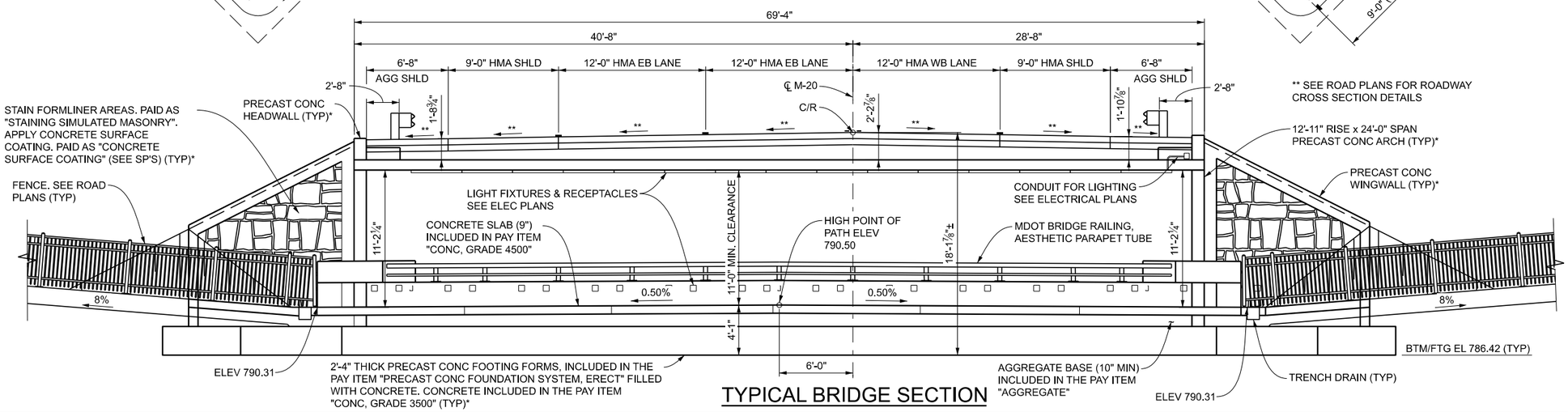
F&V PROJECT NO.
868960

C-111

ADDENDUM NO. 1



PLAN



TYPICAL BRIDGE SECTION

MISCELLANEOUS QUANTITIES

1890	Cyd	Backfill, Structure, CIP
170	Cyd	Aggregate
3538	Cyd	Excavation, Fdn
230	Syd	Aggregate Base, 10 inch
500	Syd	Geotextile, Separator, Non-Woven
220	Ft	Underdrain, Fdn, 4 inch
470	Ft	Underdrain, Fdn, 6 inch
20	Ft	Underdrain Outlet, 4 inch
20	Ft	Underdrain Outlet, 6 inch
90	Syd	Staining Simulated Masonry
90	Syd	Conc Surface Coating
95	Syd	Concrete Surface Coating

1

NOTES:

*THE PRECAST CONCRETE ARCH SECTIONS, HEADWALLS, WINGWALLS, AND FOOTING FORMS WILL BE PROVIDED TO THE CONTRACTOR BY SHELBY TOWNSHIP AND INSTALLED IN THIS CONTRACT. SEE SPECIAL PROVISION FOR "CULV, PRECAST ARCH, ERECT", AND "PRECAST CONC FOUNDATION SYSTEM, ERECT".

LAP THE LINER, PVC, 30 MIL, SEAMS A MINIMUM OF 6 INCHES AND EXTEND THE LINER UP THE HEADWALLS A MINIMUM OF 6 INCHES.

APPLY CONCRETE SURFACE COATING TO AREAS OF THE PRECAST CONCRETE COMPONENTS THAT HAVE A CONCRETE FORMLINER AND STAINING. SEE SPECIAL PROVISION.

APPLY CONC SURFACE COATING TO THE EXPOSED SURFACES OF THE PRECAST CONCRETE HEADWALLS, WINGWALLS, ARCH SECTIONS, (NON-FORMLINER AREAS), AND THE AESTHETIC PARAPET RAILING. USE A COLOR THAT COMPLEMENTS THE COLORS USED TO STAIN THE CONCRETE FORMLINER AREAS OF THE HEADWALLS AND WINGWALLS.

SEE ROAD PLANS FOR DRAINAGE DETAILS. 1

SEE MDOT SPECIAL DETAIL B-103 SERIES FOR NAME PLATE DETAILS.

FINAL ROW PLAN REVISIONS SUBMITTAL DATE:

NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION
1	12/17/25	MTL	EXCAVATION/GEOTEXTILE				

GREAT LAKES ENGINEERING GROUP, LLC

NO SCALE

DRAWN BY: RZ	DATE: DEC 2025	REVISIONS:
CHECKED BY: MTL	DESIGN UNIT: GLEG	
FILE: 974 OCP gpstr.dgn	TSC: MUSKEGON	

CS: V01 OF 64022

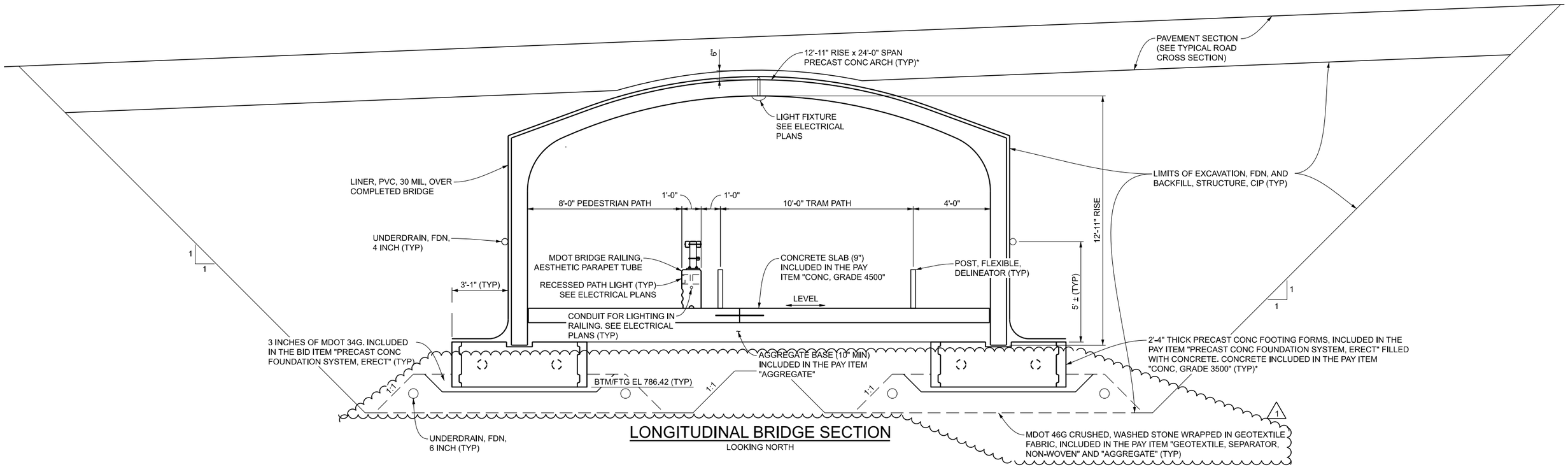
JN:

LEWIS ADVENTURE FARM & ZOO STRUCTURE

14792 STONY LAKE ROAD (M-20)

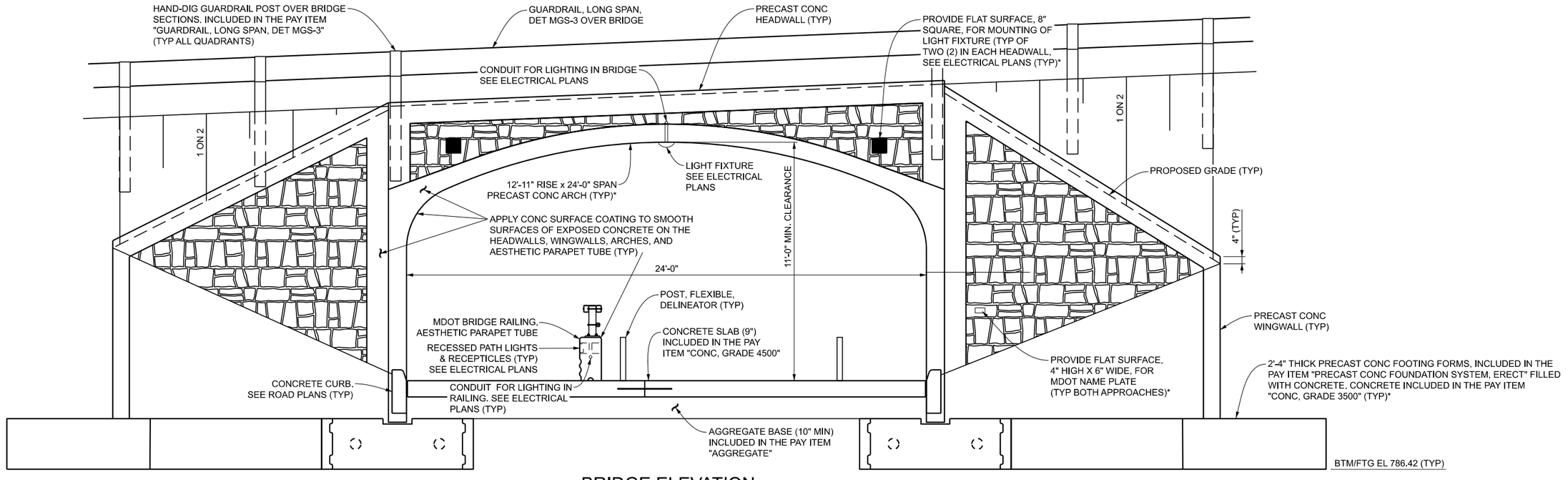
DRAWING	SHEET
GPSTR 001	SECT 2 C-112

ADDENDUM NO. 1



LONGITUDINAL BRIDGE SECTION

LOOKING NORTH



BRIDGE ELEVATION

LOOKING NORTH

FINAL ROW PLAN REVISIONS SUBMITTAL DATE:							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION
1	12/17/25	MTL	EXCAVATION/GEOTEXTILE				

GREAT LAKES ENGINEERING GROUP, LLC

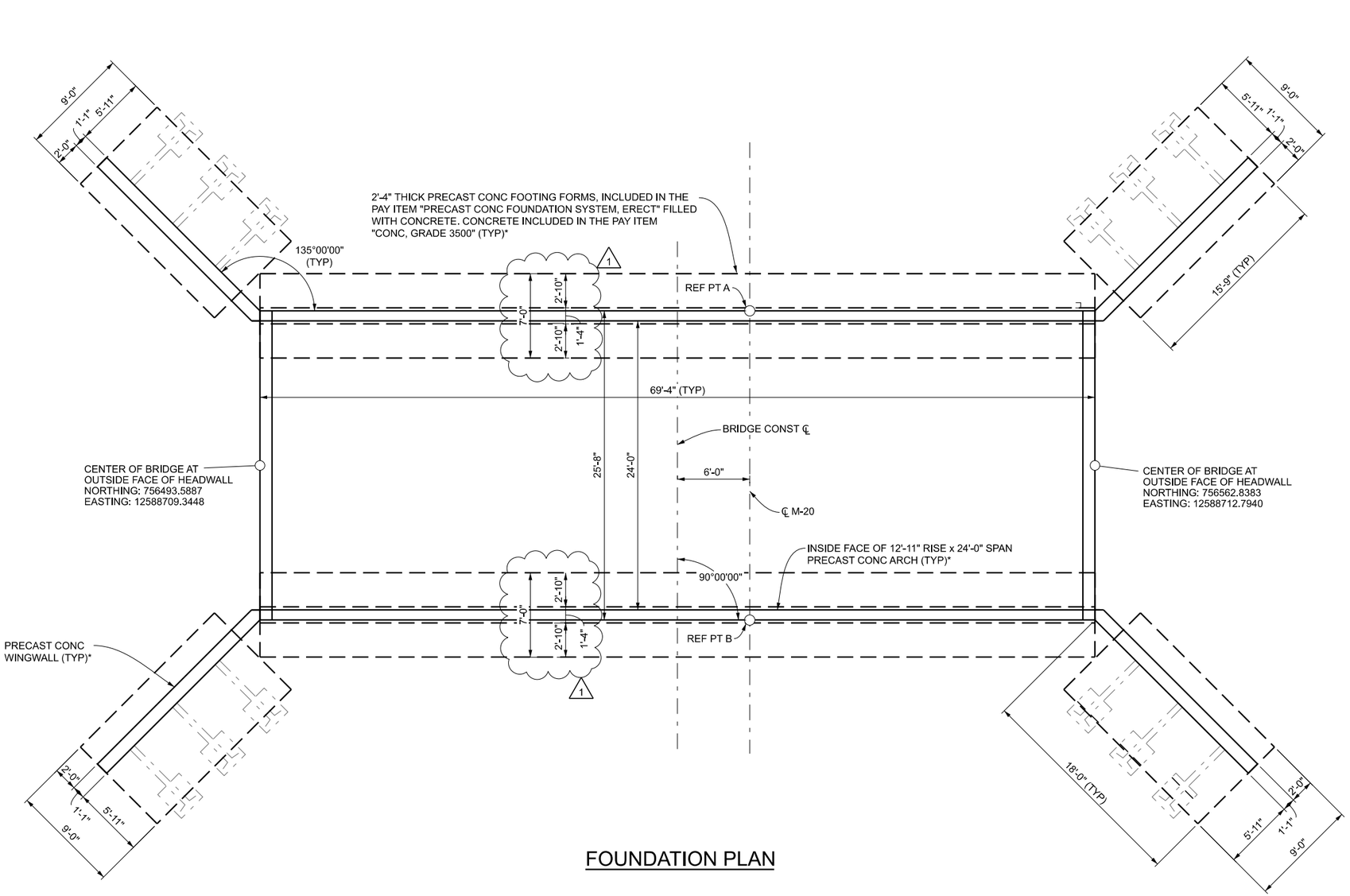
NO SCALE

DRAWN BY: RZ	DATE: DEC 2025	REVISIONS:	CS: V01 OF 64022
CHECKED BY: MTL	DESIGN UNIT: GLEG		JN:
FILE: 974 OCP gpstr.dgn	TSC: MUSKEGON		

LEWIS ADVENTURE FARM & ZOO STRUCTURE
14792 STONY LAKE ROAD (M-20)

DRAWING	SHEET
GPSTR 002	SECT 2 C-113

ADDENDUM NO. 1



FOUNDATION PLAN

MIN. LAP TABLE
EA03 BARS - 1'-5"
EA04 BARS - 1'-11"
EA05 BARS - 2'-5"
EA06 BARS - 2'-10"

MISCELLANEOUS QUANTITIES

70	Ft	Culv, Precast Arch, Erect
1	LSUM	Precast Conc Foundation System, Erect
76	Ft	Joint, Contraction, Cp
120	Ft	Joint, Contraction, C3p
25	Ft	Lane Tie, Epoxy Anchored
450	Syd	Liner, PVC, 30 mil
135	Cyd	Conc, Grade 3500
55	Cyd	Conc, Grade 4500
76	Ft	Bridge Railing, Aesthetic Parapet Tube
28	Ea	Post, Flexible, Delineator

NOTES:

1 *THE PRECAST CONCRETE ARCH SECTIONS, HEADWALLS, WINGWALLS, AND FOOTING FORMS WILL BE PROVIDED TO THE CONTRACTOR BY SHELBY TOWNSHIP AND INSTALLED IN THIS CONTRACT. SEE SPECIAL PROVISION FOR "CULV, PRECAST ARCH, ERECT", AND "PRECAST CONC FOUNDATION SYSTEM, ERECT".

CONTACT THE SOILS ENGINEER TO PERFORM A FOOTING CHECK AT LEAST 48 HOURS PRIOR TO EXCAVATING TO THE BOTTOM OF THE EXCAVATION.

THE 9 INCH CONCRETE SLAB SHALL RECEIVE THE SAME DECORATIVE, STAMPED SURFACE AS THE SHARED USE PATH. INCLUDED IN THE PAY ITEM "CONC, GRADE 4500". SEE ROAD PLANS AND SPECIAL PROVISION.

THE STEEL COMPONENTS OF THE AESTHETIC PARAPET RAILING SHALL BE SHOP COATED FOLLOWING MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION SECTION 716. THE COLOR SHALL BE BLACK AND MATCH THE COLOR OF THE ALUMINUM FENCE TO BE PLACED ON THE PATH (SEE ROAD PLANS).

SEE ROAD SHEETS FOR DRAINAGE DETAILS.

SEE MDOT SPECIAL DETAIL B-103 SERIES FOR NAME PLATE DETAILS.

FINAL ROW PLAN REVISIONS SUBMITTAL DATE:

NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION
1	12/17/25	MTL	DIMS; NOTES REVISED				

GREAT LAKES ENGINEERING GROUP, LLC

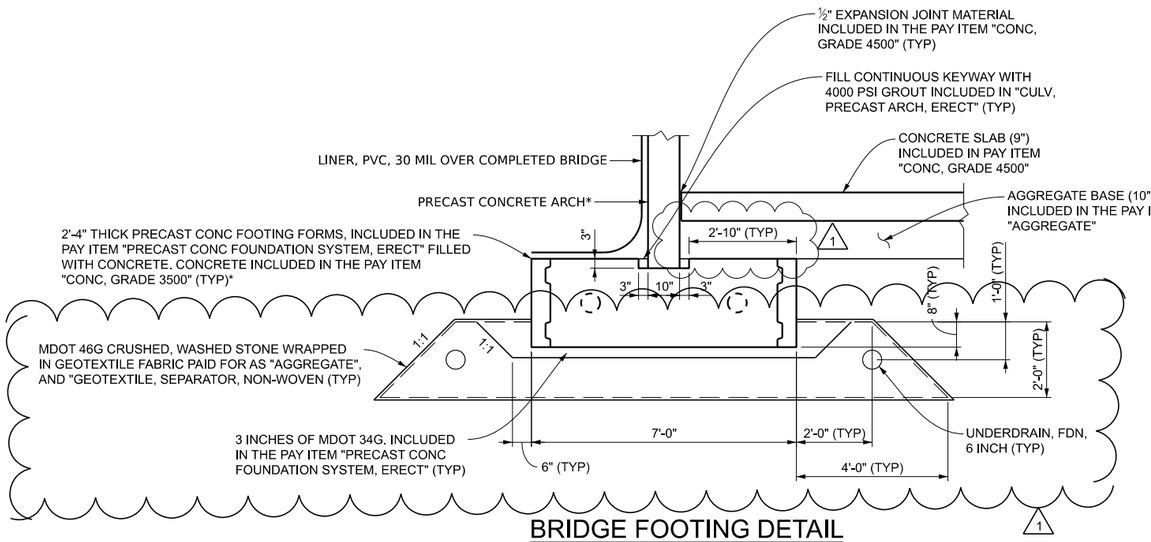
NO SCALE

DRAWN BY: RZ	DATE: DEC 2025	REVISIONS:	CS: V01 OF 64022
CHECKED BY: MTL	DESIGN UNIT: GLEG		JN:
FILE: 974 OCP ab.dgn	TSC: MUSKEGON		

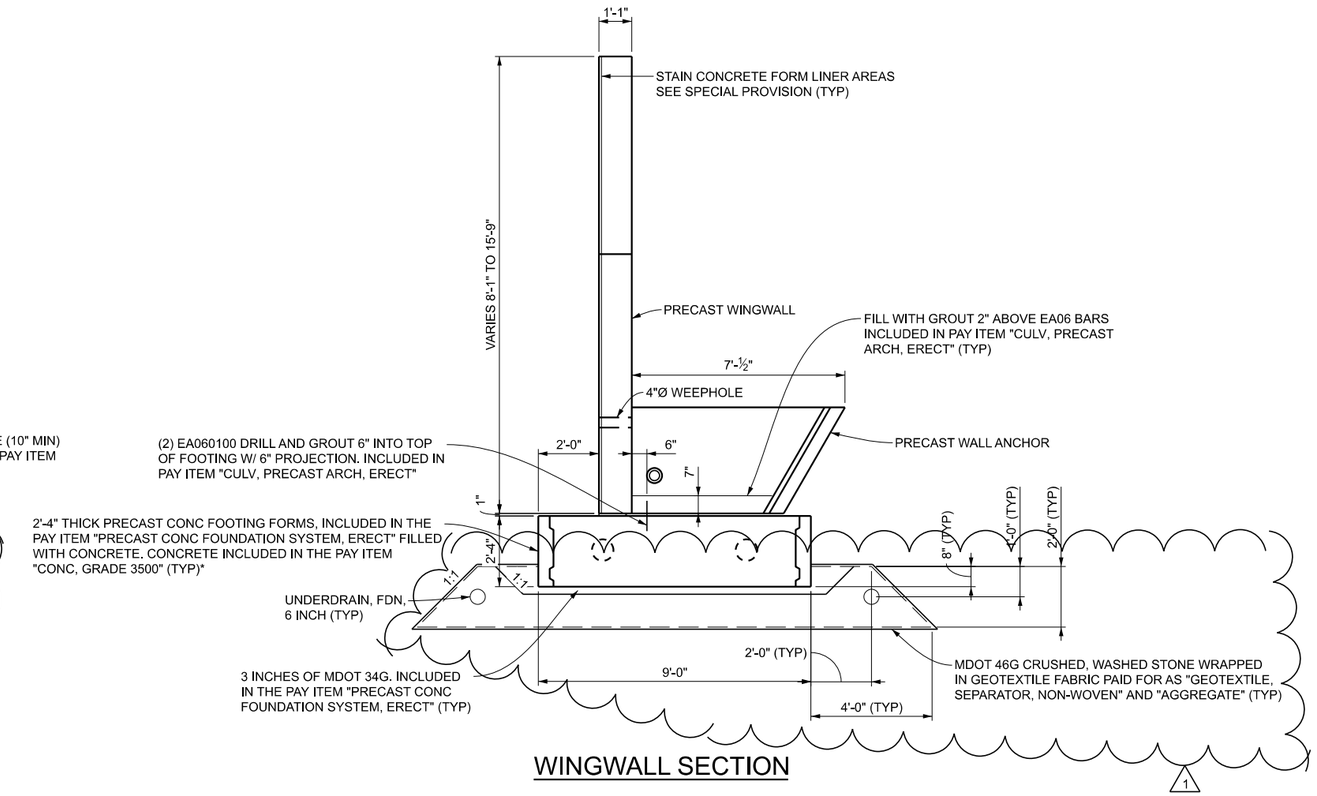
LEWIS ADVENTURE FARM & ZOO STRUCTURE
14792 STONY LAKE ROAD (M-20)

DRAWING	SHEET
ABUT 001	SECT 2 C-114

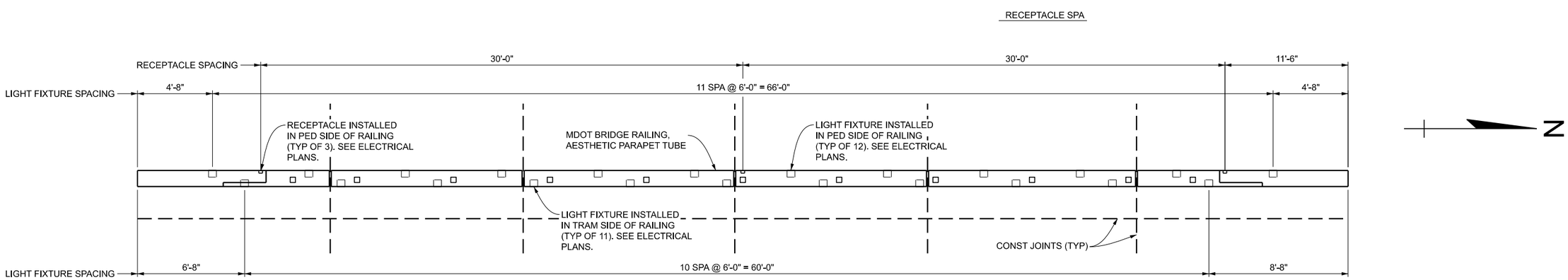
ADDENDUM NO. 1



BRIDGE FOOTING DETAIL



WINGWALL SECTION



LIGHT FIXTURE & RECEPTACLE PLAN IN AESTHETIC PARAPET RAILING

NOTES:

ADJUST REINFORCING STEEL IN RAILING TO ALLOW PLACEMENT OF LIGHT FIXTURES.

SEE ELECTRICAL PLANS FOR ADDITIONAL DETAILS.

FINAL ROW PLAN REVISIONS SUBMITTAL DATE:							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION
1	12/17/25	MTL	DIMS; EXC; GEOTEXTILE				

GREAT LAKES ENGINEERING GROUP, LLC

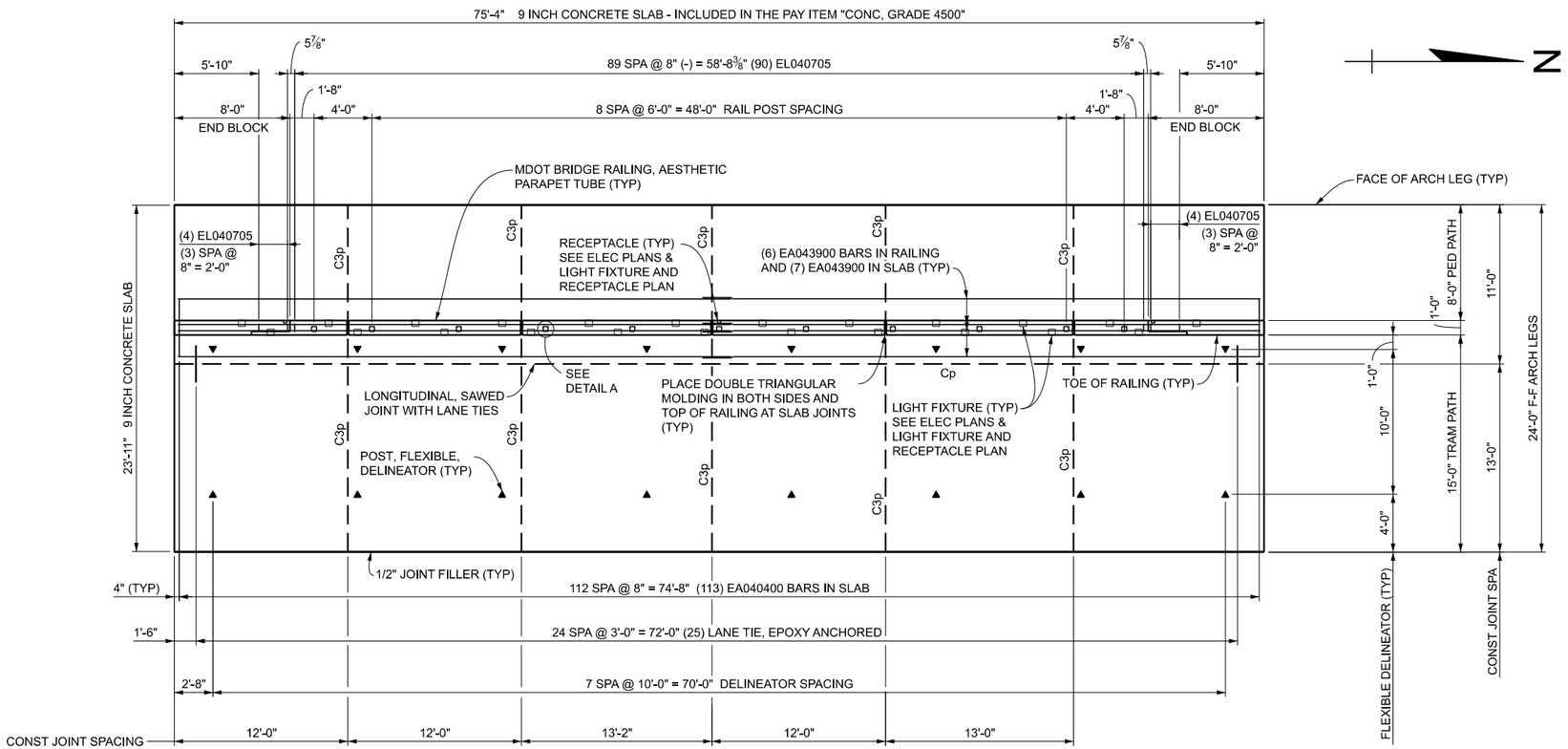
NO SCALE

DRAWN BY: RZ	DATE: DEC 2025	REVISIONS:	CS: V01 OF 64022
CHECKED BY: MTL	DESIGN UNIT:GLEG		JN:
FILE: 974 OCP ab.dgn	TSC: MUSKEGON		

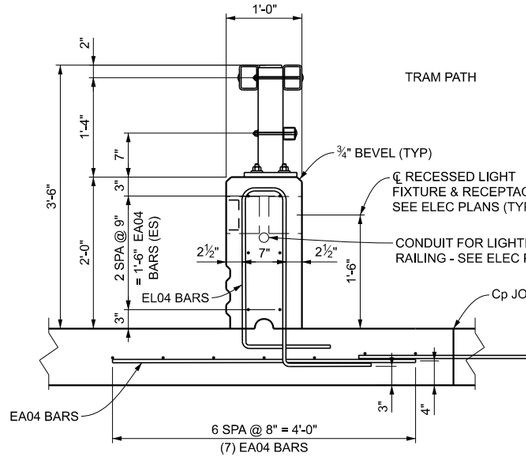
LEWIS ADVENTURE FARM & ZOO STRUCTURE
14792 STONY LAKE ROAD (M-20)

DRAWING	SHEET
ABUT 002	SECT 2 C-115

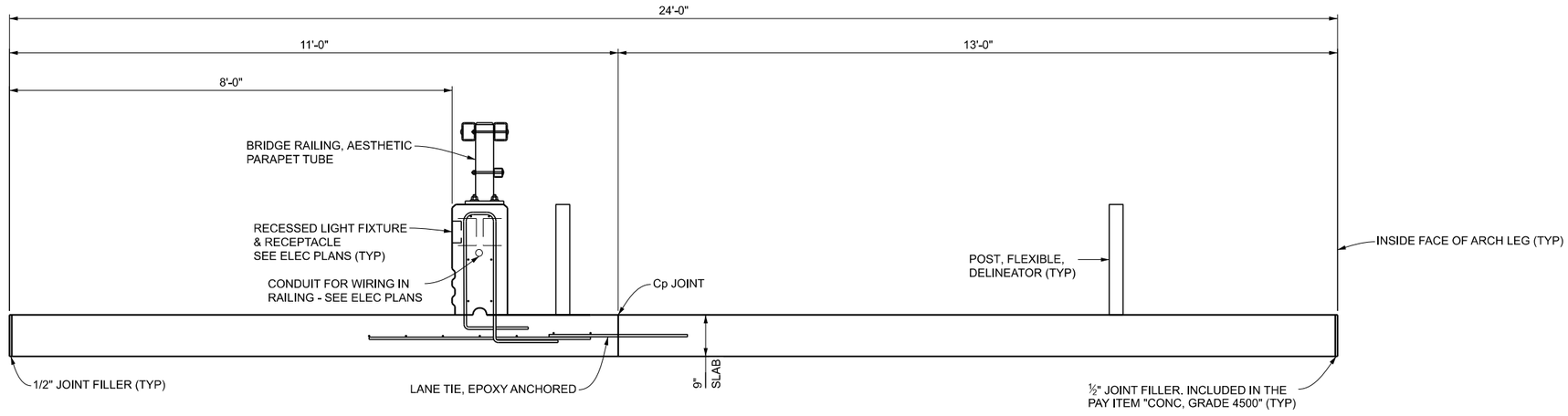
ADDENDUM NO. 1



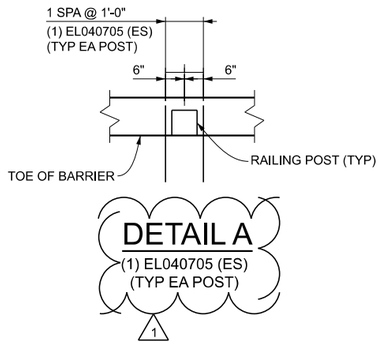
PLAN OF RAILING AND SLAB



TYPICAL RAILING SECTION



TYPICAL SLAB SECTION



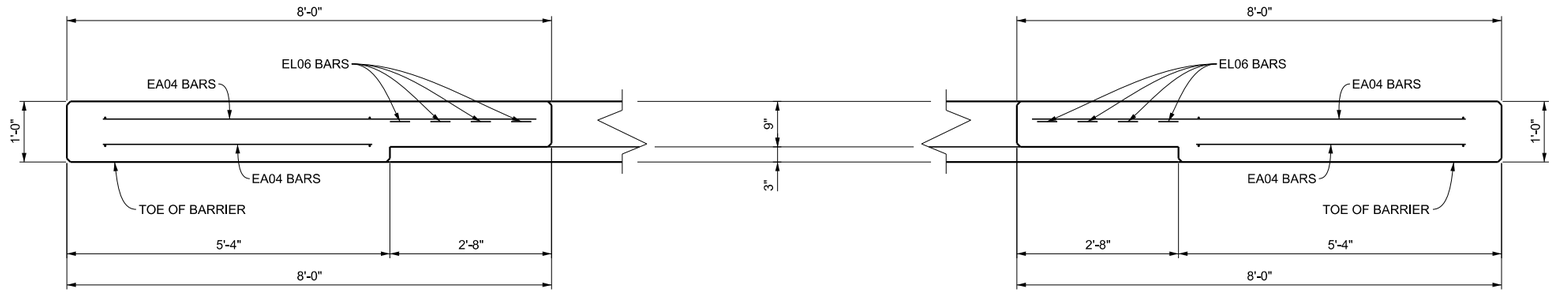
FINAL ROW PLAN REVISIONS SUBMITTAL DATE:							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION
1	12/17/25	MTL	TEXT UPDATE				

GREAT LAKES ENGINEERING GROUP, LLC

NO SCALE

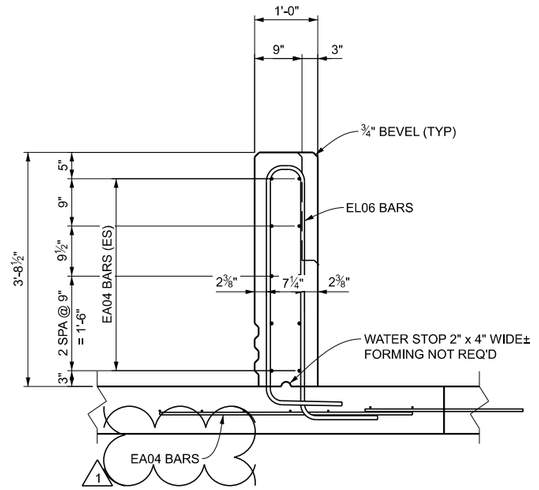
DRAWN BY: RZ	DATE: DEC 2025	REVISIONS:	CS: V01 OF 64022	LEWIS ADVENTURE FARM & ZOO STRUCTURE	DRAWING SHEET
CHECKED BY: MTL	DESIGN UNIT: GLEG		JN:	14792 STONY LAKE ROAD (M-20)	ABUT SECT 2
FILE: 974 OCP ab.dgn	TSC: MUSKEGON				003 C-116

ADDENDUM NO. 1

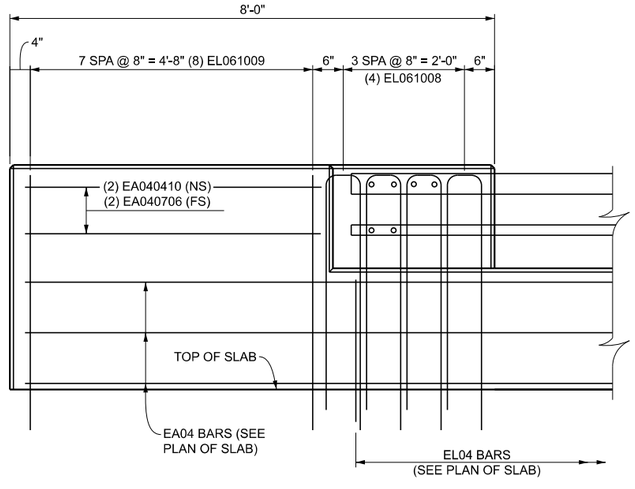


PLAN OF SOUTH END BLOCK
(LIGHT FIXTURES NOT SHOWN)

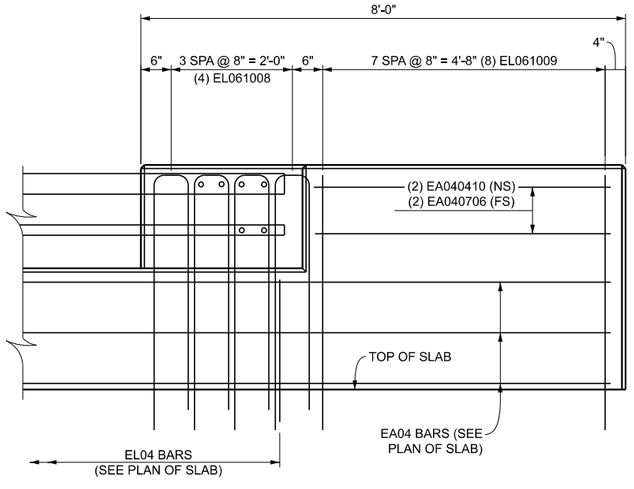
PLAN OF NORTH END BLOCK
(LIGHT FIXTURES NOT SHOWN)



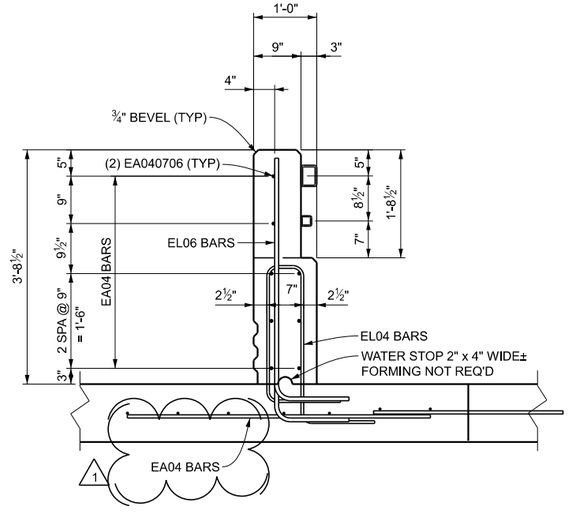
TYPICAL END BLOCK SECTION AT FULL CONCRETE AREA
(LIGHT FIXTURES NOT SHOWN)



ELEVATION OF SOUTH END BLOCK
(LIGHT FIXTURES NOT SHOWN)



ELEVATION OF NORTH END BLOCK
(LIGHT FIXTURES NOT SHOWN)



TYPICAL END BLOCK SECTION AT TUBE CONNECTION AREA
(LIGHT FIXTURES NOT SHOWN)

FINAL ROW PLAN REVISIONS SUBMITTAL DATE:							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION
1	12/17/25	MTL	BAR CALLOUT				

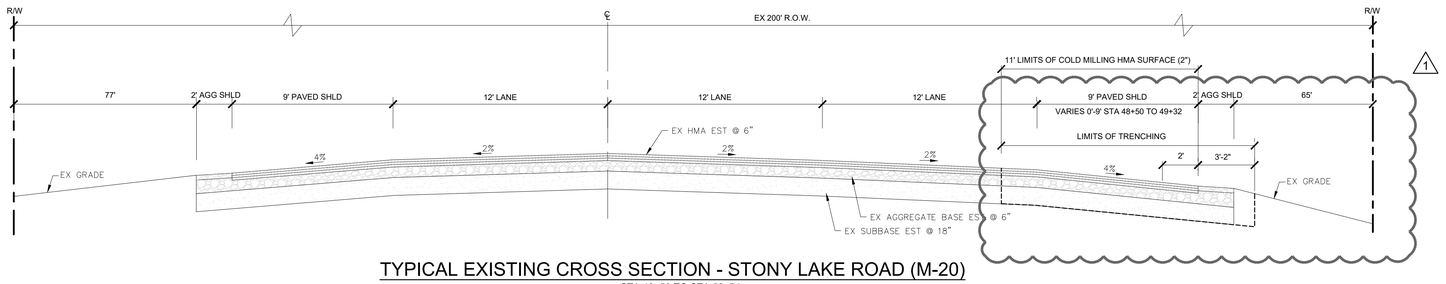
GREAT LAKES ENGINEERING GROUP, LLC

NO SCALE

DRAWN BY: RZ	DATE: DEC 2025	REVISIONS:	CS: V01 OF 64022
CHECKED BY: MTL	DESIGN UNIT:GLEG		JN:
FILE: 974 OCP ab.dgn	TSC: MUSKEGON		

LEWIS ADVENTURE FARM & ZOO STRUCTURE
14792 STONY LAKE ROAD (M-20)

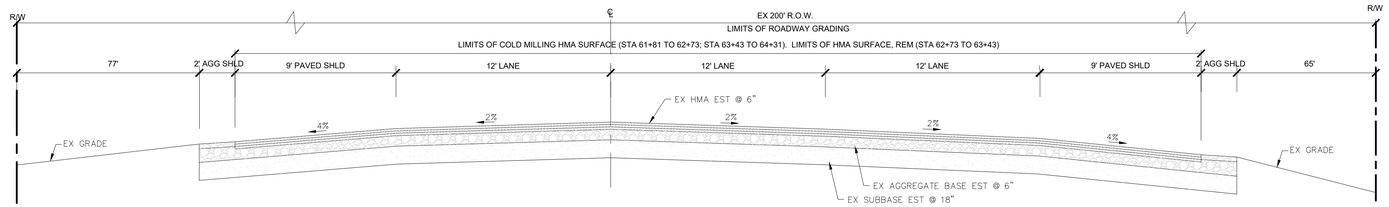
DRAWING	SHEET
ABUT 004	SECT 2 C-117



TYPICAL EXISTING CROSS SECTION - STONY LAKE ROAD (M-20)

STA 48+50 TO STA 52+74

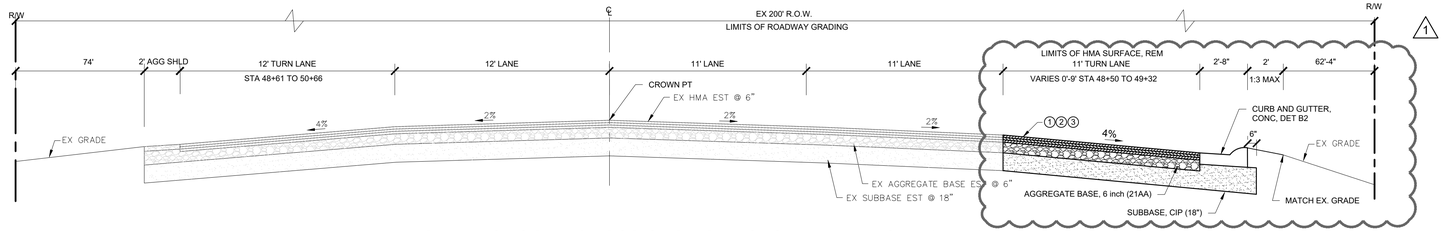
N.T.S.



TYPICAL EXISTING CROSS SECTION - STONY LAKE ROAD (M-20)

STA 61+81 TO STA 64+31

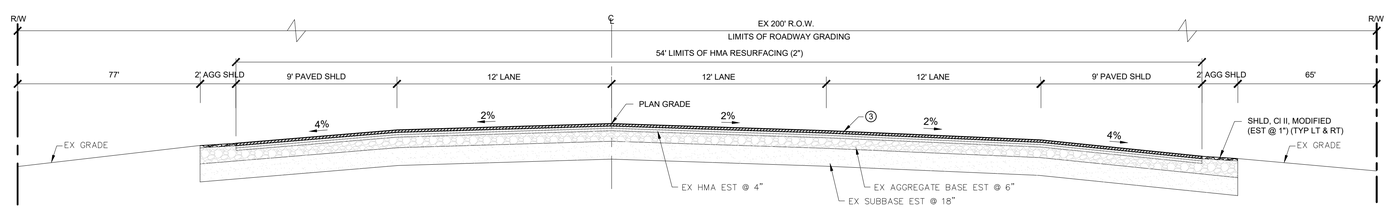
N.T.S.



TYPICAL PROPOSED CROSS SECTION - STONY LAKE ROAD (M-20)

STA 48+50 TO STA 52+74

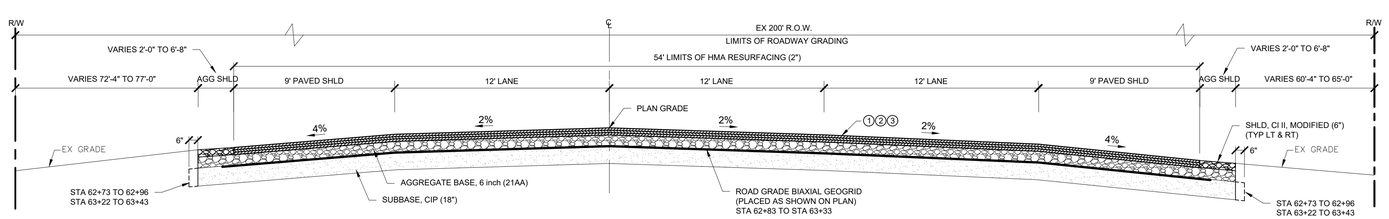
N.T.S.



TYPICAL PROPOSED CROSS SECTION - STONY LAKE ROAD (M-20)

STA 61+81 TO STA 62+73 AND STA 63+43 TO STA 64+31

N.T.S.



TYPICAL PROPOSED CROSS SECTION - STONY LAKE ROAD (M-20)

STA 62+73 TO STA 63+43

N.T.S.

HMA APPLICATION TABLE						
COURSE	TYPE	ITEM	EST. YIELD	BINDER GRADE	AWI	REMARKS
①	BASE	HMA, 4EML	220 LBS/SYD	PG 64-28	-	STONY LAKE RD / M-20
②	LEVELING	HMA, 4EML	220 LBS/SYD	PG 64-28	-	68TH AVE STONY LAKE RD / M-20
③	TOP	HMA, 4EML	220 LBS/SYD	PG 64-28	220	68TH AVE STONY LAKE RD / M-20
~~④~~		~~HAND PATCHING~~	~~220 LBS/SYD~~	~~PG 64-28~~		~~HMA, 4EML - BASE COURSE~~
~~⑤~~		~~HAND PATCHING~~	~~220 LBS/SYD~~	~~PG 64-28~~		~~HMA, 4EML - LEVELING COURSE~~
~~⑥~~		~~HMA, APPROACH~~	~~440 LBS/SYD~~	~~PG 64-28~~	~~220~~	HMA, 4EML - PLACED IN TWO 220 lb/SYD LIFTS

1

NOTES: BOND COAT SHALL BE APPLIED BETWEEN SUCCESSIVE COURSES OF HMA (PAYMENT INCLUDED IN HMA MIX).
APPLICATION RATE 0.05 TO 0.15 GAL/SYD SS-1H, AS DIRECTED BY ENGINEER.

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.
2960 Lucerne Drive SE
Grand Rapids, MI 49546
P: 616.977.1000
F: 616.977.1005

Addendum 1 12/17/2025 LBH

REVISION:

OCEANA COUNTY ROAD COMMISSION
SHELBY TOWNSHIP, OCEANA COUNTY, MICHIGAN
STRUCTURE 14792 STONY LAKE ROAD (M-20)

NOTES & TYPICAL SECTIONS

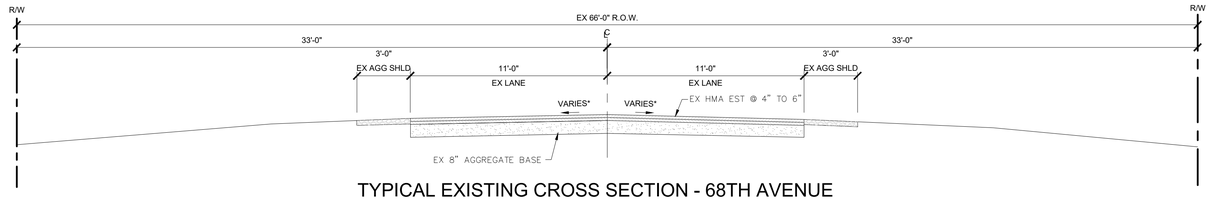
DESIGN TEAM: | PROJ MNGR: LBH | DESIGNED BY: RWT | DRAWN BY: PAD | CHECK BY:

DRAWING INFORMATION:
868960_C-201_XSEC
'121525 peted

DECEMBER 2025

F&V PROJECT NO.
868960

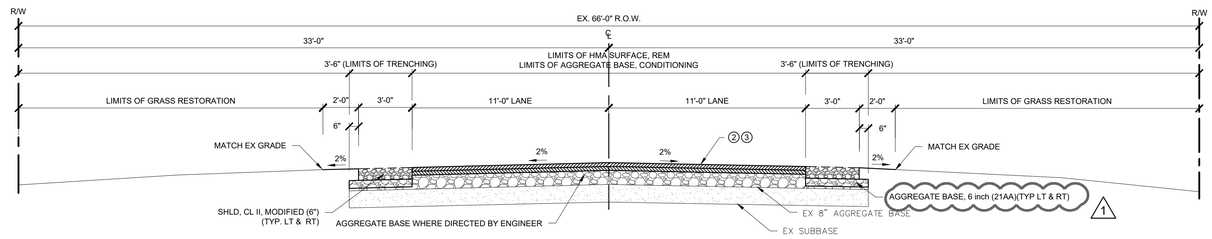
C-201



TYPICAL EXISTING CROSS SECTION - 68TH AVENUE

STA 10+00 (POB) TO STA 20+47 (POE)

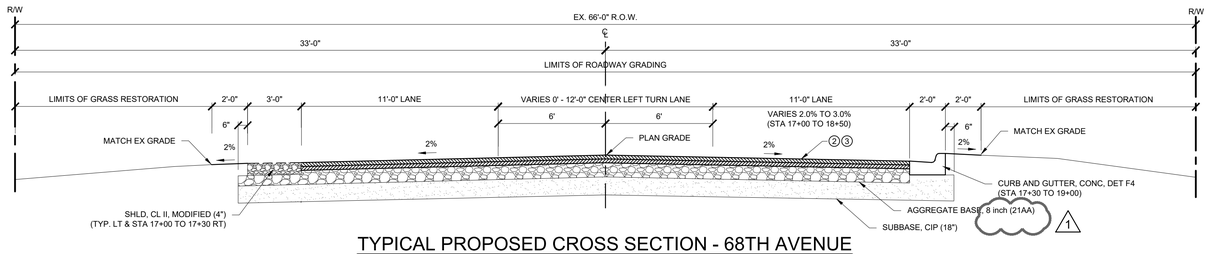
N.T.S.



TYPICAL PROPOSED CROSS SECTION - 68TH AVENUE

STA 10+00 (POB) TO STA 17+00

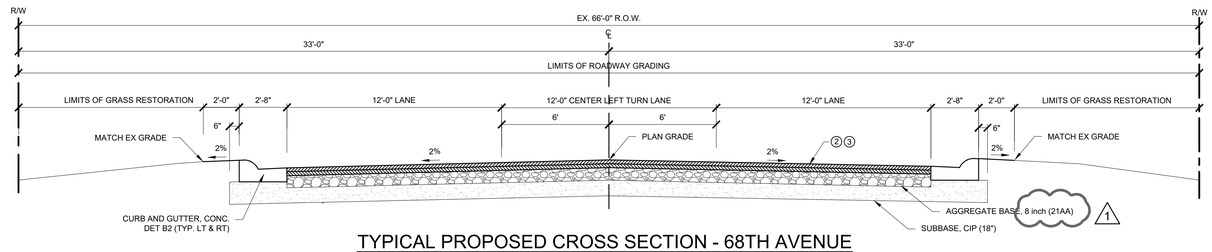
N.T.S.



TYPICAL PROPOSED CROSS SECTION - 68TH AVENUE

STA 17+00 TO STA 19+00

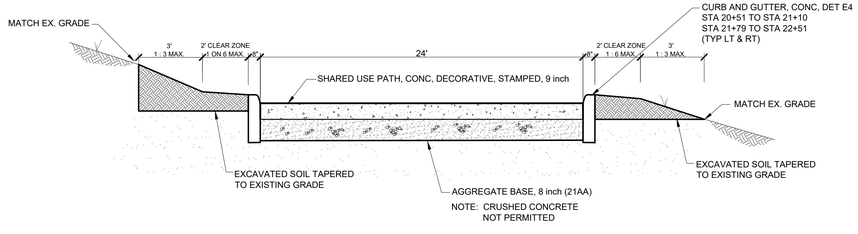
N.T.S.



TYPICAL PROPOSED CROSS SECTION - 68TH AVENUE

STA 19+00 TO STA 20+47 (POE)

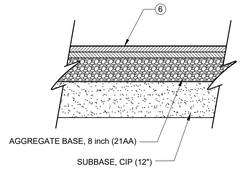
N.T.S.



TYPICAL SHARED USE PATH, CONC SECTION

STA 20+94 TO STA 21+09
STA 21+79 TO STA 21+94

SCALE: NOT TO SCALE



HMA APPROACH DETAIL

68TH AVE. STA 10+40 TO 10+97 (RT SIDE)

NOT TO SCALE

CONSTRUCTION NOTES

PUBLIC UTILITIES

THE EXISTING UTILITIES LISTED BELOW AND SHOWN ON THESE PLANS REPRESENT THE BEST INFORMATION AVAILABLE. THIS INFORMATION DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO SATISFY HIMSELF AS TO THEIR ACCURACY OR OF HIS RESPONSIBILITY IN CASE UTILITIES HAVE BEEN CONSTRUCTED OR REMOVED.

GAS	BARBARA SAUNDERS DTE GAS MSK_GASDESIGN@DTEENERGY.COM 313-235-5111	WATER & SEWER	JEREMIAH HELENHOUSE VILLAGE OF SHELBY DPWSUPERVISOR@SHELBYVILLAGE.COM 231-861-2500
FIBER OPTIC	CINDY WHITEMAN FRONTIER (PEARCE SERVICES) 860 TERRACE ST MUSKEGON, MI 49440 CYNTHIA.WHITEMAN2@FTR.COM 231-726-0290	ELECTRIC	AMRIN SHAHNOWZA CONSUMERS ENERGY 530 W. WILLOW ST. LANSING, MI 48906 517-374-2002 AMRIN.SHAHNOWZA@CMSENERGY.COM
FIBER OPTIC	HEATHER SHAWL EVERSTREAM 4273 58TH STREET HOLLAND, MI 49422 616-393-0138 Ext. 119 HEATHERS@WESTERNTEL-COM.COM	CABLE TV/ INTERNET	PATRICK DELISI CHARTER COMMUNICATIONS 1392 TRADE CENTRE DR. TRAVERSE CITY, MI 49696 810-247-3899 PATRICK.DELISI@CHARTER.COM

THE CONTRACTOR SHALL EXPOSE AND VERIFY LOCATION AND DEPTH OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION OF NEW UTILITY. CONFLICTS IN GRADES SHALL BE REPORTED TO ENGINEER AND ADJUSTMENTS SHALL BE MADE.

MISCELLANEOUS QUANTITIES

THE FOLLOWING ITEMS OF WORK SHALL BE DONE AS THEY APPLY THROUGHOUT THE PROJECT. THESE ITEMS ARE NOT DETAILED OR INCLUDED ON THE PLAN AND PROFILE SHEETS BUT ARE TO BE USED AS DIRECTED BY THE ENGINEER, WHERE REQUIRED.

QUANTITY	UNIT	DESCRIPTION
1	LSUM	GENERAL CONDITIONS, BONDS, AND INSURANCE, MAX 5%
1	LSUM	SOIL EROSION CONTROL
1	LSUM	CONTRACTOR STAKING
1	LSUM	SITE LIGHTING
1	LSUM	ELECTRICAL DISTRIBUTION
6000	DLR	CASH ALLOWANCE (ELECTRICAL SERVICE)
100	CYD	SUBGRADE UNDERCUTTING, TYPE II
50	CYD	TRENCH UNDERCUT AND BACKFILL
1	EA	MONUMENT BOX
1	EA	MONUMENT BOX ADJUST
1	EA	MONUMENT PRESERVATION
500	SYD	MULCH BLANKET
1196	FT	VIDEO TAPING SEWER AND CULV PIPE

LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	TREE (DECIDUOUS)	CB	CABLE BOX		SURVEY CONTROL POINT
	BUSH	T	TELEPHONE RISER	BM#1	BENCHMARK
	TREE (CONIFEROUS)	T	TELEPHONE MANHOLE		SECTION CORNER
	DEAD TREE	E	ELECTRICAL RISER		BOUNDARY LINE
	STUMP	E	ELECTRICAL MANHOLE		PROPERTY LINE
	MANHOLE		POWER POLE		WATER MAIN
	SANITARY CLEANOUT		LIGHT POLE		SANITARY SEWER
	RD. CATCH BASIN		GUY POLE		STORM SEWER
	SQ. CATCH BASIN		GUY ANCHOR		CULVERT (UNDER 10")
	FIRE HYDRANT		RAILROAD		CULVERT (24" AND UP)
	WATER VALVE		YARD LIGHT	CATV	CABLE T.V.
	CURB STOP & BOX		SIGN	T	TELEPHONE
W	WELL		MAILBOX	E	ELECTRIC
	WATER MANHOLE		GUARD POST	G	GAS
	WATER METER		FOUND CONC. MONUMENT	OH	OVERHEAD LINES
B#	SOIL BORING		FOUND IRON ROD		GUARDRAIL
	MONITORING WELL		SET IRON ROD	X	FENCE
					WOODLINE

NOTE: ALL ITEMS LISTED ON THE LEGEND MAY NOT BE PRESENT ON DRAWING.

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.
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Addendum 1 12/17/2025 LBH

REVISION:

OCEANA COUNTY ROAD COMMISSION
SHELBY TOWNSHIP, OCEANA COUNTY, MICHIGAN
STRUCTURE 14792 STONY LAKE ROAD (M-20)
NOTES & TYPICAL SECTIONS

DESIGN TEAM: PROJ MNGR: LBH; DESIGNED BY: RWT; DRAWN BY: PAD; CHECK BY:

DRAWING INFORMATION:
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DECEMBER 2025

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