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 SOURCING AND CONFIRMATION OF SOIL CONDITIONS.
2. PRIOR TO CONSTRUCTION, CONTRACTOR MUST VERIFY ALL ELEVATIONS SHOWN THROUGH THE ENGINEER.
3. ONLY CONTECH BRIDGE SOLUTIONS INC. THE CONSIPANS APPROVED PRECASTER IN MARYLAND MAY PROVIDE THE STRUCTURE DESIGNED IN ACCORDANCE WITH THESE PLANS.
4. THE USE OF ANOTHER PRECAST STRUCTURE WITH THE DESIGN ASSUMPTIONS USED FOR THE CONSIPANS 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 BRIDGE SOLUTIONS INC. ASSUMES NO LIABILITY FOR DESIGN OF ANY ALTERNATE OR SIMILAR TYPE STRUCTURES.
5. ALTERNATE STRUCTURES MAY BE CONSIDERED PROVIDED THAT SIGNED AND SEALED DESIGN DRAWINGS (AND CALCULATIONS) ARE SUBMITTED TO THE ENGINEER 2 WEEKS PRIOR TO THE BID DATE FOR REVIEW AND APPROVAL.

DESIGN DATA

DESIGN LOADINGS:
HEADWALLS: EARTH PRESSURE + LIVE LOAD BURCHARGE
WINDOW: EARTH PRESSURE ONLY
HEADWALL DESIGN FILL HEIGHT 1.6' MIN. FROM TOP OF CORRUGATED STRUCTURE TO BOTTOM OF FLEXIBLE PAVEMENT
3'-0' MAX. FROM TOP OF CORRUGATED STRUCTURE TO TOP OF ROADSIDE GUTTER
DESIGN METHOD: LOAD FACTOR METHOD
DESIGN PRESSURE:
NET ALLOWABLE SOIL BENDING PRESSURE: 2300 PSI
CROSS ALLOWABLE SOIL BENDING PRESSURE: 2600 PSI

MATERIALS
PRECAST UNITS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH CONSIPANS SPECIFICATIONS.
CONCRETE FOR FOOTINGS SHALL HAVE A MINIMUM COMPRSIVE STRENGTH OF 4000 PSI. STEEL FOR FOOTINGS SHALL CONFORM TO ASTM A615 OR A95/GRADE 60.

LOCATION PLAN
NOT TO SCALE

BONNIE BRANCH WOODS
HOWARD COUNTY, MARYLAND

CONSTRUCTION PRODUCTS INC.

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CONTRACT

HOWARD COUNTY, MARYLAND

AS-BUILT

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HOWARD COUNTY, MARYLAND

AS-BUILT
SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPLAN® BRIDGE SYSTEMS

1. DESIGN
1.1 All work shall consist of furnishing and constructing a CON/SPLAN® bridge system in accordance with this specification. The bridge system shall meet the applicable requirements of the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be designed in accordance with the shop drawings and designed accordingly.

2. MATERIALS
2.1 CON/SPLAN® concrete bridge system shall be composed of CON/SPLAN® bridge elements with reinforcing steel designed and manufactured in accordance with AASHTO. The bridge system shall be designed, manufactured, and assembled in accordance with the shop drawings and designed accordingly.

3. PRECAST ELEMENTS
3.1 Precast elements shall be designed in accordance with the requirements of the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The elements shall be designed in accordance with the shop drawings and designed accordingly.

4. INSTALLATION
4.1 Precast elements shall be placed in the bridge system in accordance with the requirements of the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be designed in accordance with the shop drawings and designed accordingly.

5. QUALITY ASSURANCE
5.1 The manufacturer shall be responsible for the quality of the bridge system. The manufacturer shall provide a quality assurance program that includes, but is not limited to, the following:

   a. A quality assurance program that includes a quality assurance plan that shall be submitted to the owner for review and approval.

   b. A quality assurance program that includes a quality control program that shall be submitted to the owner for review and approval.

   c. A quality assurance program that includes a quality assurance procedure that shall be submitted to the owner for review and approval.

   d. A quality assurance program that includes a quality assurance protocol that shall be submitted to the owner for review and approval.

   e. A quality assurance program that includes a quality assurance inspection that shall be submitted to the owner for review and approval.

   f. A quality assurance program that includes a quality assurance testing that shall be submitted to the owner for review and approval.

6. TESTING
6.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

7. INDUSTRY STANDARDS
7.1 The bridge system shall be manufactured in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be manufactured in accordance with the shop drawings and designed accordingly.

8. PERFORMANCE TESTING
8.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

9. QUALITY ASSURANCE TESTING
9.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

10. QUALITY CONTROL TESTING
10.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

11. QUALITY ASSURANCE TESTING
11.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

12. QUALITY CONTROL TESTING
12.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

13. QUALITY ASSURANCE TESTING
13.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

14. QUALITY CONTROL TESTING
14.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

15. QUALITY ASSURANCE TESTING
15.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

16. QUALITY CONTROL TESTING
16.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

17. QUALITY ASSURANCE TESTING
17.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

18. QUALITY CONTROL TESTING
18.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

19. QUALITY ASSURANCE TESTING
19.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

20. QUALITY CONTROL TESTING
20.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

21. QUALITY ASSURANCE TESTING
21.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

22. QUALITY CONTROL TESTING
22.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

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23.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

24. QUALITY CONTROL TESTING
24.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.

25. QUALITY ASSURANCE TESTING
25.1 The bridge system shall be tested in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges (6th edition) adopted by the Ohio Department of Transportation or AASHTO (7th edition, as approved), or other applicable state or local standards. The bridge system shall be tested in accordance with the shop drawings and designed accordingly.
CONTECH CONSTRUCTION PRODUCTS, INC.
DESIGN OF FOOTINGS, BACKFILL SPECIFICATIONS
AND SCOUR ANALYSIS
FOR A 19' x 6'-4" MULTI-PLATE ARCH;
BONNIE BRANCH WOODS
HOWARD COUNTY, MARYLAND

INDEX

1. TITLE SHEET/INDEX
2. PLAN, PROFILE AND DETAILS
3. SPECIFICATIONS
4. SPECIFICATIONS CONTINUED
1.0 GENERAL

1.1 This work shall consist of furnishing, delivering, and installing of a Mill Plan set as shown to the specification and requirements, and on the details shown on the plan.

1.2 All materials furnished shall be in accordance with the latest AASHTO Standard Specifications and Tests.

1.3 The contractor shall furnish all materials for the work in accordance with the plan and specifications.

1.4 The contractor shall provide all necessary labor, equipment, and materials for the work as required by the plans and specifications.

2.0 EMBANKMENTS

2.1 All earth embankments shall be constructed in accordance with the latest AASHO Standard Specifications and Tests.

2.2 The contractor shall provide all necessary labor, equipment, and materials for the work as required by the plans and specifications.

3.0 PROPORTIONING OF CONCRETE

3.1 COMPOSITION

3.1.1 The concrete shall be composed of cement, fine aggregate, coarse aggregate and water.

3.1.2 The concrete shall be homogeneous, readily plastic and uniformly workable and shall be proportioned in accordance with ASTM C31, 1971.

3.1.3 Proportioning shall be based on the field experience with the materials to be employed.

3.1.4 The amount of water used shall not exceed the amount of 4.5 water/cement ratio, and shall be reduced as necessary to produce concrete of the specified consistency at the time of placement.

3.1.5 An accounting system, conforming to the requirements of ASTM C67, shall be used by all concrete furnished under the scope of the contract. The quantity of materials shall be measured at the source and shall be recorded at the site in the field by an authorized inspector of the concrete manufacturer or their representative.

3.2 QUALITY REQUIRED

3.2.1 The concrete shall be tested in accordance with the applicable provisions of ASTM C31 and C33.

3.2.2 The concrete strengths shall be measured in accordance with the applicable provisions of ASTM C31 and C33.

3.2.3 The concrete strengths shall be measured in accordance with the applicable provisions of ASTM C31 and C33.

4.0 MISC. PLATE-ARCH

4.1 This work shall consist of furnishing, delivering, and installing of the Mill Plan set as shown to the specification and requirements, and on the details shown on the plan.

4.2 The contractor shall furnish all materials for the work in accordance with the latest AASHO Standard Specifications and Tests.

4.3 The contractor shall provide all necessary labor, equipment, and materials for the work as required by the plans and specifications.

5.0 MATERIALS AND DIMENSIONS

5.1 All materials furnished shall be in accordance with the latest AASHTO Standard Specifications and Tests.

5.2 The contractor shall furnish all materials for the work in accordance with the latest AASHTO Standard Specifications and Tests.

6.0 WORKSHOP AND INSPECTIONS

6.1 All concrete materials shall conform to the workshop and inspections requirements of AASHTO Standard Specifications and Tests.

7.0 QUALITIES REQUIRED

7.1 The concrete shall be tested in accordance with the applicable provisions of ASTM C31 and C33.

8.0 MIXING AND PLACING

8.1 Equipment - Ready Mix Concrete shall be used and shall conform to the Specifications for Ready Mixed Concrete.

8.2 Preparation - All work shall be in accordance with ASTM C31, "Recommended Practice for the Storage and Placing of Concrete - All concrete shall be mixed and placed by the contractor in a suitable manner.

8.3 All concrete shall be placed by an approved mechanical vibrator immediately after placement.

8.4 All concrete shall be placed by an approved mechanical vibrator immediately after placement.

8.5 FORM WORK

8.6 Forms shall be of wood, metal, or other approved material and shall be set and held true in the desired form, in accordance with the plans and specifications.

8.7 Forms shall not be removed until the concrete has sufficient strength to prevent permanent damage and to deform.
5.8 MONSEY BACKFILL REQUIREMENTS

5.8.1 GENERAL

A greater type of material shall be used inside and over the structure. This other encased backfill material shall conform to ANSI/A219 Specifications A219-64 or A219-48 as well as the following requirements. Minimum particle size shall not exceed 3.7 in.

All backfilling shall be done in accordance with the requirements of the following table.

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>CONTINUOUS</th>
<th>30°</th>
<th>45°</th>
<th>60°</th>
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</thead>
<tbody>
<tr>
<td>Material</td>
<td>219-64</td>
<td>A219-64</td>
<td>A219-48</td>
<td>A219-48</td>
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<tr>
<td>Sand, wash, screened</td>
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<td>Sand, wash, separated</td>
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<tr>
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<tr>
<td>Gravel, clean and smooth, washed</td>
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Additional Backfill Material Requirements:
1. The fill shall be well-graded material. Open graded or partially crushed materials are not allowed.
2. Fine sands, silts, silt and clay, and other materials shall not be used. Crushed rock or gravel shall be used if necessary.
3. The fill height shall not exceed 3 ft.
4. The fill shall be placed in 3 ft lifts.
5. The fill shall be placed on a 3 ft lift.
6. The fill should be free from Los Angeles Abrasion Test less than 30%.

5.8.2 BACKFILL PLACEMENT

The required width of the encased backfill shall be 3 ft minimum outside the embankment of the embankment and 18 ft minimum over the embankment. The embankment shall be placed in 3 ft lifts, compacted to the required density.

The embankment shall be placed in accordance with the requirements of the following table.

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3. The fill height shall not exceed 3 ft.
4. The fill shall be placed in 3 ft lifts.
5. The fill shall be placed on a 3 ft lift.
6. The fill should be free from Los Angeles Abrasion Test less than 30%.

5.8.3 SLOPE RATIO AND STORM WATER RUN-OFF

Potential slope shall not be greater than 0.03 (3:100) or 1:30 (1:30) in both cut and fill, and slide water shall not be directed over the slope.

5.8.4 GROUNDS

The Contractor shall spread, shape, and maintain such equipment as necessary to construct uniform layers, and control material of grade for maximum compaction and drainage.

5.8.5 CONCERNTING

The construction equipment shall be approved equipment of equal design, weight, and capacity to allow the required density to be maintained with the required specifications. Additional equipment may be required to properly maintain the required compaction.