BRIDGE STRUCTURAL NOTES

1. GENERAL:

A. THIS STRUCTURE CONFORMS TO THE 17th EDITION–2002 OF "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" & THE LATEST EDITION OF "GUIDE SPECIFICATIONS FOR DESIGN OF PEDESTRIAN BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO). THE STRUCTURE IS A SINGLE–SPAN PREFABRICATED STEEL TRUSS SUPPORTED BY REINFORCED CONCRETE SUBSTRUCTURES ON SPREAD FOOTING.

B. DESIGN LOADING:

85 PSF PEDESTRIAN
H15 MAINTENANCE VEHICLE

C. ALL CONSTRUCTION AND MATERIALS EXCEPT FOR THE PREFABRICATED STEEL TRUSS PORTION OF THE BRIDGE SHALL CONFORM TO THE FOLLOWING SECTIONS OF THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION, CONSTRUCTION AND MATERIALS SPECIFICATION DATED JANUARY 1, 2013 EXCEPT AS AMENDED BELOW:

ITEM 203 ROADWAY EXCAVATION AND EMBANKMENT
ITEM 304 AGGREGATE BASE
ITEM 501 STRUCTURES GENERAL
ITEM 503 EXCAVATION FOR STRUCTURES
ITEM 508 FALSEWORK AND FORMS
ITEM 509 REINFORCING STEEL
ITEM 511 CONCRETE FOR STRUCTURES
ITEM 512 TREATING CONCRETE
ITEM 513 STRUCTURAL STEEL MEMBERS
ITEM 601 SLOPE AND CHANNEL PROTECTION
ITEM 832 TEMPORARY SEDIMENT AND EROSION CONTROL

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS AND METHODS AS WELL AS FOR ALL SAFETY CONDITIONS AT THE SITE.

D. PAYMENT FOR BRIDGE CONSTRUCTION SHALL BE BE MADE AT THE RESPECTIVE LUMP SUM AND UNIT PRICES BID AND SHALL INCLUDE ALL LABOR, MATERIAL, EQUIPMENT, TOOLS AND INCIDENTALS TO COMPLETE THE WORK IN ACCORDANCE WITH THE SPECIFICATIONS AND TO THE SATISFACTION OF THE ENGINEER. THE FOLLOWING PAY ITEMS AND METHODS OF MEASUREMENT APPLY TO THIS PROJECT:

ITEM SPECIAL REINFORCED CONCRETE ABUTMENTS, INCLUDING PILES
METHOD OF PAYMENT: LUMP

ITEM SPECIAL PREFABRICATED STEEL TRUSS BRIDGE SUPERSTRUCTURE
METHOD OF PAYMENT: LUMP

ITEM SPECIAL HIGH FRICTION SURFACE TREATMENT
METHOD OF MEASUREMENT AND PAYMENT: SY

2. FOUNDATIONS

A. HELICAL PILE FOUNDATIONS SHALL BE DESIGNED BY THE PILE MANUFACTURER USING AVAILABLE INFORMATION FROM THE SOILS REPORT PREPARED BY TIMMERMAN GEOTECHNICAL GROUP, INC. DATED APRIL 1, 2014. ADDITIONAL SOIL SAMPLING, TESTING, ETC., MAY BE OBTAINED BY THE CONTRACTOR AT HIS DISCRETION AND AT NO ADDITIONAL COST.

PRIOR TO INSTALLING THE HELICAL SCREW PILES, EXCAVATE THE EXISTING SOIL TO THE LIMITS SHOWN ON THE EXCAVATION DETAIL ON SHT. 78/81. BACKFILL AND COMPACT AS PER 503.08.

3. HELICAL PILES

MANUFACTURER EXAMPLES THAT HAVE PRODUCTS WHICH MEET THIS SPECIFICATION ARE:

1. A.B. CHANCE COMPANY 2. ATLAS SYSTEMS, INC.
3. PIERTECH SYSTEMS, LLC.

HELICAL PILE SHALL BE HOT–DIPPED GALVANIZED.

MANUFACTURER SHALL DESIGN PILES TO RESIST AN ULTIMATE AXIAL (COMPRESSIVE) LOAD OF 64,000 LBS. THE ABOVE LOAD INCLUDES A MINIMUM FACTOR OF SAFETY OF TWO.

SEE SOILS REPORT FOR SOIL PROPERTIES.

INSTALL HELICAL PILES PER MANUFACTURER'S SPECIFICATIONS.

FIELD VERIFY THE LOCATION OF ALL EXISTING UTIILTIES PRIOR TO PILE INSTALLATION. CONTACT ENGINEER IF A CONFLICT OCCURS.

PROVIDE UNIT PRICE FOR EACH LINEAR FOOT OF ADDITIONAL DEPTH OF HELICAL PILE REQUIRED BEYOND THE HELICAL PILE MANUFACTURER'S APPROVED SHOP DRAWINGS, DUE TO SOIL CONDITIONS NOT CONSISTENT W/ REFERENCED GEOTECHNICAL REPORT.

4. CONCRETE AND CONCRETE REINFORCEMENT:

A. ABUTMENT AND FOOTING CONCRETE SHALL BE CLASS QC1 PROPORTIONED TO OBTAIN A 28 DAY COMPRESSIVE STRENGTH OF 4000 PSI. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH ITEM 511. ALL EXPOSED CONCRETE SURFACES SHALL HAVE A RUBBED FINISH.

B. CLEARANCE TO REINFORCING STEEL SHALL BE 2" UNLESS NOTED OTHERWISE.

C. ALL REINFORCING STEEL SHALL BE EPOXY COATED AND CONFORM TO ASTM A615, GRADE 60. REINFORCING STEEL PLACEMENT SHALL BE IN ACCORDANCE WITH ITEM 509.

D. UNLESS OTHERWISE REQUIRED BY THE PREFABRICATED BRIDGE MANUFACTURER, PROVIDE 1"± GROUT BELOW BRIDGE BEARING PLATES TO PRODUCE A LEVEL AND UNIFORM BEARING SURFACE. ALL GROUT SHALL BE NON–SHRINK NONMETALLIC TYPE.

5. SUBMITTALS

A. CONCRETE TESTING SHALL BE IN ACCORDANCE WITH SECTION 455. THE CONTRACTOR SHALL ARRANGE FOR A QUALIFIED INDEPENDENT TEST LAB TO PERFORM ALL TESTING WORK. TESTING COST SHALL BE PAID FOR BY THE CONTRACTOR. TEST DATA SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

B. CONCRETE MIX DESIGNS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

C. REINFORCING STEEL SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

D. PREFABRICATED BRIDGE SHOP DRAWINGS AND DESIGN CALCULATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. SEE PREFABRICATED BRIDGE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

E. CERTIFICATION FOR TREATED TIMBER SHALL BE IN ACCORDANCE WITH THE CURRENT ODOT SUPPLEMENT 1072.

F. HELICAL PILES:
SUBMIT DRAWINGS DETAILING PILES. SUBMIT MANUFACTURER'S SPECIFICATIONS AND CONTRACTORS INSTALLATION PROCEDURE, INCLUDING MINIMUM REQUIRED INSTALLATION TORQUE. SUBMIT LOAD CAPACITY CALCULATIONS.

SUBMIT ESTIMATED PILE LIFE CALCULATIONS DEMONSTRATING PILE CAN WITHSTAND ULTIMATE DESIGN LOADS OVER A STRUCTURE LIFE OF 50 YEARS DUE TO SECTION LOSS FROM CORROSION.

ALL DRAWINGS AND CALCULATIONS SHALL BE STAMPED BY A LICENSED ENGINEER REGISTERED IN THE STATE OF OHIO.

6. PREFABRICATED STEEL BRIDGE:

A. GENERAL:

1. THESE SPECIFICATIONS ARE FOR A FULLY ENGINEERED CLEAR SPAN BRIDGE OF WELDED STEEL CONSTRUCTION AND SHALL BE REGARDED AS MINIMUM STANDARDS FOR DESIGN AND CONSTRUCTION.
2. THE SPECIFIC BRIDGE TYPE REQUIRED SHALL BE A HALF–THROUGH, H–TYPE TRUSS BRIDGE OF EITHER PRATT OR BOWSTRING STYLE.
3. THE BRIDGE MANUFACTURER SHALL HAVE BEEN IN THE BUSINESS OF DESIGN AND FABRICATION OF BRIDGES FOR A MINIMUM OF FIVE YEARS AND PROVIDE A LIST OF FIVE SUCCESSFUL BRIDGE PROJECTS, OF SIMILAR CONSTRUCTION, EACH OF WHICH HAS BEEN IN SERVICE AT LEAST THREE YEARS.
4. BRIDGE MANUFACTURER SHALL SUBMIT SHOP DRAWINGS. AT A MINIMUM, SHOP DRAWING SUBMITTALS SHALL CONSIST OF BRIDGE DRAWINGS, CALCULATIONS STAMPED BY A REGISTERED ENGINEER IN THE STATE OF OHIO, SPLICING AND ERECTION PROCEDURES, AISC SHOP CERTIFICATION AND WELDER QUALIFICATIONS.
5. BRIDGE MANUFACTURER SHALL PROVIDE A LOAD PLAQUE LISTING PROJECT NAME, DATE MANUFACTURED, MANUFACTURER, DESIGN LOADS AND BRIDGE SERIAL NUMBER.
6. EACH BIDDER IS REQUIRED TO IDENTIFY THEIR INTENDED PREFABRICATED BRIDGE SUPPLIER AND PROVIDE DOCUMENTATION OF THE SUPPLIER'S QUALIFICATIONS AS PART OF THE BID SUBMITTAL. SUPPLIERS NOT MEETING THE MINIMUM QUALIFICATIONS SPECIFIED HEREIN, AS DETERMINED BY THE ENGINEER, WILL BE CAUSE FOR REJECTION OF THE BID.

B. BRIDGE DIMENSIONS

1. WIDTH: 8 FEET 0 INCHES CLEAR, MEASURED FROM INSIDE FACE TO INSIDE FACE OF RAILINGS.
2. SPAN: OUT TO OUT LENGTH OF THE BRIDGE SHALL BE: 140 FEET 0 INCHES
3. CAMBER: BRIDGE SHALL BE CAMBERED TO OFFSET DEAD LOAD AND APPEAR FLAT.
4. FINISHED DECK TO LOW STEEL: THE STRUCTURE DEPTH FROM FINISHED DECK TO LOW STEEL SHALL NOT EXCEED 36 INCHES.

C. DESIGN

1. TRUSS BRIDGES SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER EXPERIENCED IN THROUGH TRUSS BRIDGE DESIGN AND TOP CHORD STABILITY CRITERIA UTILIZING ELASTIC LATERAL RESTRAINTS.
2. UNIFORM LIVE LOAD: PEDESTRIAN BRIDGES SHALL BE DESIGNED FOR AN EVENLY DISTRIBUTED LIVE LOAD OF 85 POUNDS PER SQUARE FOOT OF DECK AREA. FOR THE DESIGN OF PRIMARY TRUSS MEMBERS WHEN THE DECK AREA EXCEEDS 400 SQUARE FEET, THE LOAD MAY REDUCED IN ACCORDANCE WITH THE FOLLOWING FORMULA WHERE "W" IS THE PEDESTRIAN LOAD (PSF) AND "A" IS THE DECK INFLUENCE AREA. THE REDUCED DESIGN LOAD FOR PRIMARY TRUSS MEMBERS SHALL NOT BE LESS THAN 65 PSF:
   W= 85(0.25 + 15 / (A^.5))
3. VEHICULAR LOAD: BRIDGE COMPONENTS SHALL BE DESIGNED FOR A SINGLE H–15 30,000 POUND MAINTENANCE OR EMERGENCY VEHICLE PLACED ON THE SPAN. WHEEL LOADS SHALL BE PLACED TO MAXIMIZE STRESSES IN THE MEMBER UNDER CONSIDERATION. THE CENTER OF WHEEL LOADS SHALL BE CONSIDERED NO CLOSER THAN 1 FOOT FROM THE INSIDE FACE OF THE HANDRAIL. IMPACT AND LANE LOAD SHALL NOT BE CONSIDERED. THE VEHICULAR LOAD SHALL NOT BE COMBINED WITH OTHER UNIFORM LIVE LOADS.
4. WIND LOAD: ALL BRIDGES SHALL BE DESIGNED FOR MINIMUM WIND LOADS IN ACCORDANCE WITH THE REFERENCED AASHTO STANDARD SPECIFICATIONS. THE WIND LOAD IS CALCULATED ON THE ENTIRE VERTICAL SURFACE OF THE BRIDGE AS IF FULLY ENCLOSED.
5. DESIGN CRITERIA: STRUCTURAL STEEL ALLOWABLE STRESSES SHALL BE IN ACCORDANCE WITH THE "AMERICAN INSTITUTE OF STEEL CONSTRUCTION", "ALLOWABLE STRESS DESIGN", LATEST EDITION. WELDED TUBULAR CONNECTIONS SHALL BE DESIGNED PER THE AMERICAN NATIONAL STANDARDS INSTITUTE / AMERICAN WELDING SOCIETY (ANSI/AWS) AND THE CANADIAN INSTITUTE OF STEEL CONSTRUCTION (CISC) "HOLLOW STRUCTURAL SECTION CONNECTIONS AND TRUSSES – A DESIGN GUIDE" LATEST EDITION.
6. TEMPERATURE: BRIDGE SHALL BE DESIGNED TO ACCOMMODATE A TEMPERATURE DIFFERENTIAL OF 120 DEGREES FAHRENHEIT. EXPANSION BEARINGS SHALL INCLUDE SLIP PADS OF UHMW POLYETHYLENE PLACED BETWEEN THE SMOOTH SURFACE OF THIS SETTING PLATE AND THE SMOOTH BEARING PLATE OF THE BRIDGE, OR OTHER BEARING ASSEMBLY DESIGNED BY THE BRIDGE MANUFACTURER. PROVIDE 1" CLEARANCE BETWEEN THE BRIDGE AND CONCRETE PIER BACKWALL (FIXED END) AND 2" CLEARANCE BETWEEN THE BRIDGE AND CONCRETE ABUTMENT BACKWALL AT 60° F (EXPANSION END).
7. DEFLECTION: THE VERTICAL DEFLECTION OF THE MAIN TRUSS DUE TO PEDESTRIAN LIVE LOAD SHALL NOT EXCEED 1/500 OF THE SPAN LENGTH (1/360 OF SPAN FOR FLOOR SYSTEM MEMBERS). THE HORIZONTAL DEFLECTION DUE TO LATERAL WIND LOAD SHALL NOT EXCEED 1/500 OF THE SPAN LENGTH.

D. MATERIALS:

1. ALL MEMBERS OF THE MAIN TRUSS AND BRACING SYSTEM SHALL BE FABRICATED FROM SQUARE AND/OR RECTANGULAR STRUCTURAL STEEL TUBING. FLOOR BEAMS AND STRINGERS MAY BE WIDE FLANGE OR CHANNEL SHAPES. ALL STRUCTURAL STEEL MEMBERS SHALL HAVE A MINIMUM THICKNESS OF MATERIAL OF AT LEAST 1/4".
2. ALL BRIDGE STRUCTURAL MEMBERS SHALL BE WEATHERING STEEL FABRICATED FROM ASTM A242 OR ASTM A709 STEEL FOR PLATES AND STRUCTURAL SHAPES AND ASTM A606 OR ASTM A847 FOR TUBULAR SECTIONS. MINIMUM YIELD (Fy) SHALL BE 50,000 PSI.
3. WOOD DECKING SHALL BE GRADED SELECT STRUCTURAL DOUGLAS FIR WITH A 3" MINIMUM NOMINAL THICKNESS. WOOD DECKING SHALL BE TREATED TO A MINIMUM OF 0.40 POUNDS OF ACZA PRESERVATIVE PER CUBIC FOOT OF WOOD. THE WOOD DECK SHALL BE DESIGNED FOR A MINIMUM 100 PSF UNIFORM LOADING CONDITION AS WELL AS THE WHEEL LOADINGS PRODUCED BY THE VEHICULAR LOAD. FLOOR PLANKS SHALL BE ATTACHED WITH AT LEAST TWO PLATED FASTENERS WHERE PLANKS CROSS SUPPORTING MEMBERS.
4. FIELD SPLICES SHALL BE BOLTED WITH ASTM A325 TYPE 3 (WEATHERING STEEL) BOLTS AND ASTM A194 HEAVY HEX HEAD NUTS AND WASHERS MATCHING THE WEATHERING STEEL TYPE OF A325 BOLTS. THESE SHALL BE TENSIONED TO A LOAD EQUAL TO 70% OF MINIMUM TENSILE STRENGTH OF BOLTS UNLESS SPECIFIED OTHERWISE ON THE DESIGN AND/OR ERECTION DRAWINGS PREPARED BY THE PREFABRICATED BRIDGE MANUFACTURER.
5. WELDING MATERIALS SHALL BE IN STRICT ACCORDANCE WITH THE AMERICAN WELDING SOCIETY (AWS). STRUCTURAL WELDING CODE, D1.1. FILLER METAL AS SPECIFIED IN D.1 SHALL BE USED FOR THE PARTICULAR WELDING PROCESS REQUIRED.
6. ANCHOR RODS FOR THE PREFABRICATED BRIDGE: ONLY ASTM F1554, GRADE 55 ANCHOR RODS HOT DIP ZINC COATED TO ASTM F2329–05 STANDARD SPECIFICATION FOR ZINC COATING SHALL BE USED. MATCHING NUTS AND WASHERS SHALL BE HOT DIP ZINC COATED TO ASTM F2329–05 STANDARD SPECIFICATION FOR ZINC COATING.

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REV.	DATE	DESCRIPTION
1	06/02/14	REVISED PER LOCAL AGENCY COMMENTS
2	06/27/14	REVISED PER LOCAL AGENCY COMMENTS
3	07/18/14	REVISED PER LOCAL AGENCY COMMENTS
4	07/25/14	REVISED PER LOCAL AGENCY COMMENTS
5	08/01/14	MILLER PARCEL UTILITY UPDATE
6	08/05/14	COMMENTS FOR GRADING APPROVAL
7	08/20/14	REVISED PER LOCAL AGENCY COMMENTS
8	08/22/14	SANITARY REVISION MH 300–302
9	09/12/14	REVISED PER LOCAL AGENCY COMMENTS

THE PRESERVE AT MILLER'S FARM
SE CORNER OF SR 18 AND MEDINA LINE RD
COPLEY, OHIO 44321

BRIDGE
(FOR INFORMATIONAL PURPOSES ONLY)
NOTES

ISSUED FOR:	
PERMIT	06-02-14
BID	06-02-14
CONSTRUCTION	09-16-14
RECORD	-

PROJECT MANAGER	DESIGNER
MAL	DGN

JOB NO.
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