SECTION 323113 – CONCRETE PAVING

PART 1 = GENERAL

1.01 SCOPE

A. Concrete work as defined herein shall include, but not be limited to, roadway pavement, toll islands, foundations, treadle concrete, scale pit, conduit and pipe encasements, drainage structures, and all miscellaneous concrete structures required. Concrete shall conform to the Ohio Department of Transportation (ODOT), Construction and Materials Specification (CMS)
- January 2016, except as modified herein.

B. Roadway pavement concrete shall meet the requirements of Item 451.
Toll island, foundations, treadle, scale pit concrete shall meet the requirements of Item 511. Miscellaneous Concrete Structures not specifically listed herein shall conform to the appropriate section of the Specifications as directed by the Engineer.

C. Related Sections:

1. Section 014000 "Quality Control."
2. Section 033000 "Cast-In-Place Concrete."
3. Section 310000 "Earthwork."

1.02 SUBMITTALS

A. Shop Drawings for the fabrication and placing of reinforcement shall be submitted to the Architect/Engineer for review in conformance with specification 03200, Section 1.03.B.

B. Mix designs for each class of concrete.

C. Concrete shall be tested in accordance with Item 511 of the ODOT CMS. Test results shall indicate the project identification, name of contractor, name of supplier, and truck number, concrete class and type, design requirements, date of pour, date of test, compressive strength, slump and air content for concrete exposed to weather.

D. Submit working drawings and calculations prepared, signed, sealed and dated by an Ohio Registered Professional Engineer for temporary excavation support systems required to install canopy column foundations along the existing lane 6.

1. Design excavation support system in accordance with the latest edition of the *AASHTO Guide Design Specifications for Bridge Temporary Works*, Section 4. Design for HS20 loading, dead loads and earth pressure loads.

E. Submit manufacturer's data for joint fillers, joint sealers, surface sealers, and other pertinent data as required by the Engineer.

F. Submittals for this section shall be delivered to the Engineer as one complete package including all materials specified under this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Concrete shall be QC1, 4,000 psi concrete per ODOT CMS Item 499. Crushed slag will not be used for the coarse aggregate.

B. Aggregate base under concrete structures shall conform to ODOT CMS Item 304 and SP 304.

C. Admixtures, other than those specified herein, shall not be added to the concrete except as accepted by the Engineer.

D. Reinforcing steel shall conform to Specification 03200.

E. Joint filler shall be bituminous preformed expansion joint filler conforming to the requirements of ODOT CMS 705.03 and AASHTO M153.

F. Joint sealing compound in roadways and islands shall be hot-poured type conforming to ODOT CMS 705.04. Sealing compound shall be applied 3/4-inch deep, unless noted otherwise on the Plans, and installed in accordance with manufacturer's recommendations.

G. Concrete penetrating sealer shall be a silane based sealer with 40 percent solids equal to Protectosil Aqua-Trete 40 as manufactured by Evonik Corporation. Products shall conform to SP 536.

H. Chemical hardeners shall be a colorless aqueous solution containing a blend of magnesium fluosilicate and zinc fluosilicate combined with a wetting agent, containing not less than 2 pounds of fluosilicates per gallon.

1. Subject to compliance with requirements, provide one of the following: "Surfhard", Euclid Chemical Co.; "Lapidolith", or "Fluohard", L&M Construction Chemical, Inc.

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS

A. The placement and removal of forms shall conform to the applicable portions of the Specifications, or as specified herein. All recesses, chases, slots and openings required by the various trades and specified on the Plans shall be located in the forms.

B. The Contractor shall furnish and place all reinforcement bars, stirrups, hanger bars, wire fabric, and other reinforcing, all wire ties, chairs, spacers, supports, and other devices necessary to secure the reinforcement until concrete is placed, as recommended by the Code of Standard Practice of the Concrete Reinforcing Steel Institute. The reinforcement shall be supported in such a manner that no ferrous metal will be left on any exposed concrete surface. All reinforcing steel shall have a

minimum 2-inch cover unless otherwise shown on the Plans.

1. Bar mats and reinforcing shall have all intersections securely fastened with approved mechanical ties. All reinforcement shall, when placed, be free from mill scale and rust, grease, clay or other foreign substances. Metal bar supports, ties, and spacers shall be of steel, of approved design, and adequate to insure against displacement of the reinforcement during the course of construction. Chairs which will be exposed shall be galvanized.

C. Concrete placement shall not be scheduled without personnel, materials and equipment present and standing by in amounts sufficient, to properly unload, convey, place, finish, and protect the concrete to be placed as hereinafter specified. No concrete shall be placed until the Engineer has inspected and approved the excavations, reinforcement and built-in items. Before pouring, wood forms shall be fully saturated with water. Plywood, metal and pressed wood forms shall be coated with a non-staining form oil or lacquer.

D. Except as directed, placing of concrete shall cease at a falling temperature of 40 degrees and may commence at a rising temperature of not less than 35 degrees F. Concrete shall be conveyed as rapidly as possible in a manner which shall prevent separation of the ingredients and shall be deposited in layers so as to bring the work upward as near level as possible. It shall be vibrated with an internal type mechanical vibrator, spaded, rammed and puddled to ensure contact with forms and reinforcing. Excessive vibration shall be avoided. Honey-combed work will not be acceptable. The Contractor shall schedule his work so that the number of construction joints will be minimized.

E. Curing and protection shall be accomplished in accordance with ODOT CMS 451.10 except as follows:

1. Traffic lanes, for the length of the islands, shall be cured in accordance with and shall receive a coat of concrete surface sealer as specified in Paragraph 2.01, G.

2. No curing compounds or other coatings shall be used on booth floor slabs.

F. Forms shall not be removed in less than seven days for those items above grade or two days from those items below grade which may be backfilled against immediately. Care shall be taken during removal to prevent damage to the concrete. Immediately after the removal of forms, voids, stone pockets, tie holes, and other imperfections in concrete shall be patched before concrete is dry. Defective areas shall be chipped away to a depth not less than one inch with the edges perpendicular to the surface. Mortar for patching shall be the same material as the concrete being repaired with the coarse aggregate omitted. All patch areas shall be thoroughly saturated before patching is commenced. Concrete surfaces not exposed shall be patched, struck flush, and left unfinished. Exposed surfaces shall receive a rubbed finish as soon as forms are removed. Exposed surfaces shall be rubbed with a fine carborundum stone and liquid grout to produce a smooth surface free from holes, fins, or other imperfection. Patches shall be cured by use of water curing for a period of at least seven days.

G. Any defective concrete work shall be removed or corrected as specified for other concrete work in the Standard Specifications or as directed.

3.2 FOOTINGS

A. Forms are not required for footings except where they are needed as screed boards, or where the soil is such that reasonably neat excavations cannot be cut.

B. Reinforcing shall be placed a minimum of three (3) inches clear of ground on bottom and sides except as otherwise indicated on the Plans. Mats shall be placed accurately in excavation, supported on concrete brickettes or other acceptable non-metallic and non-wooden chairs. All reinforcing shall be tied at each intersection.

C. Embedded items, except those shown on the Plans, shall not be placed in the forms without specific approval, for each item, accessories required to be built in or connected to the concrete shall, where practical, be placed and secured in position before concrete is placed.

D. Joints in footings are not permitted.

E. Curing shall be accomplished on surfaces exposed to the air and sun with an accepted curing compound or by use of water curing for a period of at least seven days.

F. Form release agents (if used) shall be compatible with final finishes.

G. Provide excavation support system along existing lane 6 for installation of canopy column footings.

3.4 TOLL ISLANDS

A. For this section the ODOT CMS Item 608, "Walks, Curb Ramps, and Steps," Paragraphs 608.01 through 608.03 inclusive, 608.06 and 608.07, published in the ODOT CMS, shall govern.

B. Surfaces which will be exposed shall be constructed of plywood or pressed wood to provide a smooth finish free from honeycombing grain marks, bulges, and depressions. All formwork shall be cleaned before placing concrete.

C. Reinforcing shall be accurately positioned and fastened securely to prevent displacement during placement of concrete. Each tie shall be wired to each main reinforcement bar at each intersection. Side clearance shall be as indicated on the plans. No bar shall be closer than two inches to an adjacent bar except at laps.

D. Embedded items, except those shown on the plans, shall not be placed in the forms without specific acceptance for each item from the Engineer. Pipe sleeves, inserts, bolts, frames, conduits, and accessories required to be built in or connected to the concrete shall, where practical, be placed and secured in position before concrete is placed.

E. Jointing shall be located where shown on the plans. Any joints proposed by the Contractor and not shown shall be submitted for review before reinforcing shop drawings are submitted. Joints shall be bulkheaded and keyed.

F. Curing shall be accomplished with an accepted curing compound except as specified in Section 3.01E.

G. Expansion Joints

1. The expansion joints shall be of the form, dimensions, material, and type shown on the plans and specified herein.

2. The 1/2-inch filler for the islands shall be set approximately one inch below the surface and the joint shall be placed in a manner similar to that specified for roadway pavement expansion joints.

3. The 1/2-inch premolded joint specified between the roadway pavement and island curb shall be set approximately two inches below the surface and sealed with an accepted hot joint filler as specified to provide a watertight joint.

H. Surface Finish

1. The island surface between the curb face and the toll booth, and other concrete surfaces where a non-slip finish is required shall have a broom finish. Toll islands shall receive a final coat of non-epoxy sealer per SP 536. Concrete Weatherproofing.

2. The deflectors and pylons shall receive a grout cleaned finish. The surface of islands and crash curbs shall be finished smooth with a wood float.

3.5 ROADWAY PAVEMENT

For this section the ODOT CMS Item 451, "Reinforced Portland Cement Concrete Pavement," paragraphs 451.01 through 451.16 inclusive, published in the ODOT CMS, shall govern completely.

3.6 CONSTRUCTION INCIDENTALS

A. The Contractor shall place in the roadway pavement treadle frames and weighing scale frames. These shall be set and securely fastened to maintain their position during and after placing of the concrete. Steel surfaces shall be free of rust, scale, oil, grease, or other foreign substances before any concrete is deposited.

B. All transverse and longitudinal grades specified on the plans shall be strictly maintained between and through the toll islands. The Contractor shall use whatever measures necessary to maintain pavement grades shown on the plans.

C. Before placing the roadway pavement, the roadway curb face below the top of the pavement shall be painted with paraffin or mastic of an approved type to provide a cleavage joint, other than monolithic and non-monolithic with pre-molded expansion material.

D. Roadway pavement expansion joints, contraction joints, and longitudinal joints shall be located as shown on the plans and shall conform to the details shown on the plans or on the Standard Construction Drawings. The Contractor is to utilize the transverse joints placed at

the plaza construction limits and shall take the necessary precautions to straighten or otherwise adjust the load transfer bars of these joints in case they are bent or otherwise out of line to insure proper joint function; concrete shall be properly vibrated at joints to provide proper embedment of joint steel without segregation of concrete mix.

E. The Contractor's attention is directed to all work, particularly in connection with roadway drainage, plumbing, electrical work, which require conduit and other items to be embedded in the pavement. No concrete shall be placed until such items have been placed, inspected, and tested.

3.7 FIELD QUALITY CONTROL

A. Refer to Section 014000 "Quality Control" and Section 033000 "Cast-In-Place Concrete."

END OF SECTION 321313
CONCRETE PAVING