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Specifications

Lucas County Sidewalk Repairs Toledo, Ohio 43604

Project No. 14007

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Prepared for:

**Board of Lucas County Commissioners
One Government Center Suite 800
Toledo, Ohio 43604**

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GENERAL CONDITIONS

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SECTION 01 11 10
SUMMARY OF WORK

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Bid Package Summary.
- B. Contractor use of site and premises.
- C. Work Sequence.
- D. Owner occupancy.

1.2 BID PACKAGE SUMMARY

- A. This section includes a brief description of the Work. It is issued as a guide to aid the Bidder in understanding the scope of work, but SHALL NOT be considered as being all inclusive or limited to the scope of the Work described in the Contract Documents.
- B. Bid Package Items, Base Bid:
 - 1. Bid Package No. 1: General Trades Contract (Concrete Paving and Related Work)
Scope of Work:
 - a. All Construction Work related to Area A (Courthouse) and Area B (Corrections Center/Formal Court of Appeals), including but not limited to concrete removal, base and subbase work, compaction, new paving, paving raising related grading and seed, and all other work related to these areas.
 - 2. Alternates:
 - a. See Section 01 23 00 Alternates.

1.3 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings and as agreed upon with Owner during construction phase. Allow for public use of site and premises as agreed to with Owner prior to proceeding with the Work. Do not block entrances or exits from the buildings.
- B. Contractor shall assume full responsibility for protection of Products stored on site, and for all Work performed under this Contract.

1.4 WORK SEQUENCE

- A. Construct Work without delay continuously from Notice to Proceed until completion.
- B. Construct Work on the various sites in a sequence that is in agreement with schedule and sequence approved by Owner. Do not revise the approved schedule and sequence without approval of the Owner.
- C. Work to be substantially complete and ready for inspection on the date agreed upon as the date of Substantial Completion.

1.5 OWNER OCCUPANCY

- A. The Owner will occupy the various buildings and sites during and throughout the period of construction. It is assumed the Work related to this project will be performed during normal business hours. The Contractor(s) shall make all efforts to limit construction noise and other disruptions, and allow Owner to perform business as usual.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 12 13

CONTRACT CONSIDERATIONS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Schedule of Values.
- B. Application for Payment.
- C. Change procedures.

1.2 SCHEDULE OF VALUES

- A. Submit typed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet.
- B. Submit Schedule of Values in duplicate within 15 days after date established in Notice to Proceed.
- C. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the major specification Section. Identify site mobilization, bonds and insurance, and other pertinent information.
- D. Include in each line item, the amount of Allowances specified in this Section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.
- E. Include separately from each line item a directly proportional amount of Contractor's overhead and profit.
- F. Revise schedule to list approved Change Orders, with each Application for Payment.

1.3 APPLICATIONS FOR PAYMENT

- A. Submit three copies of each application on AIA Form G702 - Application and Certificate for Payment.
- B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.
- C. Payment Period: Monthly.
- D. Waiver of Lien: Must be submitted with each Payment Application after the first.

1.4 CHANGE PROCEDURES

- A. The Architect/Engineer will advise of minor changes in the Work not involving an adjustment to Contract Sum/Price or Contract Time as authorized by AIA A201, by issuing supplemental instructions on AIA Form G710.
- B. The Architect/Engineer may issue a Proposal Request or which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications. Contractor will prepare and submit an estimate with 15 days, and will include a revised project schedule.
- C. The Contractor may propose a change by submitting request for change to the Architect/Engineer, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum/Price and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 60 00.
- D. Stipulated Sum/Price Change Order: Based on Proposal Request or Bulletin and Contractor's fixed maximum price quotation or Contractor's request for a Change Order as approved by Architect/Engineer.
- E. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract. Architect/Engineer will determine the change allowable in Contract Sum/Price and Contract Time as provided in the Contract Documents.
- F. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.
- G. Change Order Forms: AIA G701/AIA G701/CM Change Order.
- H. Execution of Change Orders: Architect/Engineer will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 23 00

ALTERNATES

1 PART 1: GENERAL

1.01 GENERAL

- 1.1 To allow the Owner to compare total costs, and to enable the Owner's decision prior to awarding the Contract, certain Alternates have been established as described in this Section of these Specifications.
- 1.2 Required Alternates are worded briefly. Claims for additional compensation will not be granted because of omissions or discrepancies.
- 1.3 Provisions for substitutions are made elsewhere in this Specification.
- 1.4 Each bidder shall submit with his proposal in the space provided on the Bid Form Alternate proposals stating the additions to or deductions from the base bid lump sum amount for substituting, omitting, adding, changing, or altering materials, equipment, or construction from that shown on the Drawings and as specified.
- 1.5 The difference in cost shall include omissions, changes, alterations, additions, and adjustments of trades as may be necessary because of each addition, substitution, omission, change, or alteration.
- 1.6 If the Owner elects to proceed on the basis of one or more of the Alternates, make modifications to the Work required in the providing of the selected Alternate or Alternates to the approval of the Architect and at no additional cost to the Owner other than as proposed on the Bid Form.

1.02 SUMMARY OF ALTERNATES:

GENERAL CONTRACT ALTERNATES

ALTERNATE G-1: Area C (Correctional Treatment Facility/Youth Treatment Center/Work Release)

Scope of work includes but is not limited to:

All Construction Work related to Area C (Correctional Treatment Facility/Youth Treatment Center/Work Release), including but not limited to concrete removal, base and subbase work, compaction, new paving, paving raising related grading and seed, and all other work related to these areas.

ALTERNATE G-2: Area D (Family Court Center)

Scope of work includes but is not limited to:

All Construction Work related to Area D (Family Court Center), including but not limited to concrete removal, base and subbase work, compaction, new paving, paving raising related grading and seed, and all other work related to these areas.

ALTERNATE G-3: Area E (Juvenile Justice Center)

Scope of work includes but is not limited to:

All Construction Work related to Area E (Juvenile Justice Center), including but not limited to concrete removal, base and subbase work, compaction, new paving, paving raising related grading and seed, and all other work related to these areas.

ALTERNATE G-4: Area F (Vehicle Maintenance)

Scope of work includes but is not limited to:

All Construction Work related to Area F (Vehicle Maintenance), including but not limited to concrete removal, base and subbase work, compaction, new paving, paving raising related grading and seed, and all other work related to these areas.

ALTERNATE G-5: Area G (Spencer Township Neighborhood Development Center)

Scope of work includes but is not limited to:

All Construction Work related to Area G (Spencer Township Neighborhood Development Center), including but not limited to concrete removal, base and subbase work, compaction, new paving, paving raising related grading and seed, and all other work related to these areas.

END OF SECTION

SECTION 01 31 00

COORDINATION AND MEETINGS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Coordination.
- B. Preconstruction/Site Mobilization Conference.
- C. Progress meetings.

1.2 COORDINATION

- A. **The General Contractor shall be the lead contractor, and shall be responsible for coordinating all work on the project in a sequential and timely manner.**
- B. Coordinate scheduling, submittals, and Work of the various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later, and for accommodating Owner occupancy.
- C. Coordinate installation of all items identified in the Documents as being installed or reinstalled within the Area of Construction.
- D. Coordinate completion and clean up of Work of separate Sections in preparation for Substantial Completion and for portions of Work designated for Owners occupancy.
- E. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.3 PRECONSTRUCTION/SITE MOBILIZATION CONFERENCE

- A. Refer to General Conditions for Owner scheduling of preconstruction meeting.
- B. Attendance Required: Owner, Architect/Engineer, Prime Contractors, Contractor's Superintendents or suppliers as requested by the Architect/Engineer.
- C. Agenda:
 - 1. Distribution of Contract Documents.
 - 2. Submission of list of Subcontractors, list of products, Schedule of Values, and progress schedule.
 - 3. Designation of personnel representing the parties in Contract, and the Architect/Engineer.
 - 4. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders and Contract closeout procedures.
 - 5. Scheduling.
 - 6. Scheduling activities of testing agencies.

7. Use of premises by Owner and Contractor.
8. Owner's requirements.
9. Construction facilities and controls provided by Owner.
10. Temporary utilities provided by Owner.
11. Security and housekeeping procedures.
12. Schedules.
13. Procedures for maintaining record documents.

1.4 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work per requirements of General Conditions.
- B. A weekly progress meeting will be scheduled with required attendance by a representative of all prime contractors as well as other parties identified as critical to the progress of this project.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 32 19

SUBMITTALS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Submittal procedures.
- B. Construction progress schedules.
- C. Proposed products list.
- D. Shop drawings.
- E. Product data.

1.2 SUBMITTAL PROCEDURES

- A. Transmit each submittal with AIA Form G810 or Architect/Engineer accepted form.
- B. Identify Project, Contractor, Subcontractor or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate.
- C. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
- D. Schedule submittals to expedite the Project, and deliver to Architect/Engineer at business address. Coordinate submission of related items.
- E. Provide space for Contractor and Architect/Engineer review stamps.
- F. Revise and resubmit submittals as required, identify all changes made since previous submittal.
- G. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.3 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial progress schedule in duplicate within 10 days after date established in Notice to Proceed for Architect/Engineer review.
- B. When revisions are required revise and resubmit to Architect prior to subsequent project meeting.
- C. Submit a computer generated chart with separate line for each section of Work,

identifying first work day of each week.

- D. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
- E. Indicate estimated percentage of completion for each item of Work at each submission.

1.4 PROPOSED PRODUCTS LIST

- A. Within 10 days after date of Notice to Proceed, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.5 SHOP DRAWINGS

- A. Submit in the form of four (5) copies minimum; six (7) copies each all Engineering related materials. Include sufficient copies for close out manuals. In lieu of hard copies, submittal of one (1) digital copy via email is preferred.
- B. After review, reproduce and distribute in accordance with Article on Procedures above and for Record Documents described in Section 01 77 00 - Contract Closeout.

1.6 PRODUCT DATA

- A. Submit the number of copies the Contractor requires, plus two copies which will be retained by the Architect/Engineer. In lieu of hard copies, submittal of one (1) digital copy via email is preferred, with the exception of color charts and samples.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
- C. Within 10 days after date of Notice to Proceed, submit 3 copies of color samples for each item requiring color selection.
- D. After review, distribute in accordance with Article on Procedures above and provide copies for Record Documents described in Section 01 77 00 - Contract Closeout.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 45 00

QUALITY CONTROL

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance and control of installation.
- B. References.
- C. Manufacturers' field services and reports.

1.2 QUALITY ASSURANCE AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.3 REFERENCES

- A. Conform to reference standard by date of issue current on date of Contract Documents.
- B. Obtain copies of standards when required by Contract Documents.
- C. Should specified reference standards conflict with Contract Documents or current standards, request clarification for Architect/Engineer before proceeding.
- D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.4 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. Submit qualifications of observer to Architect/Engineer 30 days in advance of required observations. Observer is subject to the approval of Architect/Engineer and Owner.

- B. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance of equipment as applicable, and to initiate instructions when necessary.
- C. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- D. Submit report in duplicate within 7 days of observation to Architect/Engineer for review.

2. PART 2 PRODUCTS

Not Used.

3. PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary Utilities: Electricity, water, and sanitary facilities.
- B. Temporary Controls: Barriers, protection of the Work, and water control.
- C. Construction Facilities: Progress cleaning.

1.2 TEMPORARY ELECTRICITY

- A. The Contractors shall furnish their own power for tools and equipment during the course of construction.

1.3 TEMPORARY WATER

- A. Where available on the exterior of associated Owner operated buildings, the Contractor may utilize access to water.

1.4 TEMPORARY SANITARY FACILITIES

- A. The Contractors shall furnish their own sanitary facilities during the course of construction.

1.5 BARRIERS

- A. Provide barriers as necessary to prevent pedestrian and vehicular traffic from Areas of Construction during construction operations.
- B. Materials and equipment shall be stored on site only to the limits as agreed to with the Owner. Protect such stored materials from damage.

1.6 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual specification Sections.
 - 1. **The Prime Contractor shall be responsible for graffiti and other damages incurred to new work until such time as concrete has set sufficiently to deter such damage.**
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to minimize damage.

1.7 SECURITY

- A. Provide security to protect Work and existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.8 PROGRESS CLEANING

- A. The entire work site, including the Contractor's work and approved storage areas, shall be kept in a neat, clean, and orderly condition.
- B. Provide general daily clean-up and disposal service for removal of dust, dirt, soil, trash, and debris.
- C. Pathways for the general public shall be kept clean at all times. Where necessary to access buildings and building entrances, furnish safe walkway paths for public use.
- D. Dispose of waste, trash, and debris in a safe and acceptable manor in accordance with applicable laws and ordinances and as prescribed by authorities having jurisdiction. No waste material, trash, or debris shall be buried or burned on the site.
- E. Waste material, trash, and debris shall be removed from the site daily.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 60 00

MATERIAL AND EQUIPMENT

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Transportation and handling.
- C. Storage and protection.
- D. Product options.
- E. Substitutions.

1.2 PRODUCTS

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
- C. Provide interchangeable components of the same manufacturer, for similar components.

1.3 TRANSPORTATION AND HANDLING

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.4 STORAGE AND PROTECTION

- A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated products, place on sloped supports, above ground.
- C. Provide off-site storage and protection when site does not permit on-site storage or protection.

- D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- E. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- G. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

1.5 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named. Substitution must be received 5 days prior to date of bid opening.

1.6 SUBSTITUTIONS

- A. Instructions to Bidders specify time restrictions for submitting requests for Substitutions during the bidding period to requirements specified in this Section.
- B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.
- C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.
- D. A request constitutes a representation that the Bidder:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 - 2. Will provide the same warranty for the Substitution as for the specified product.
 - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- F. Substitution Submittal Procedure:

1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence.
3. The Architect/Engineer will notify Contractor, in writing, of decision to accept or reject request.

2. PART 2 PRODUCTS

Not Used.

3. PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 77 00
CONTRACT CLOSEOUT

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Closeout procedures.
- B. Final cleaning.
- C. Adjusting.
- D. Project record documents.
- E. Operation and maintenance data.
- F. Warranties.
- G. Spare parts and maintenance materials.

1.2 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect/Engineer's inspection.
- B. Provide submittals to Architect/Engineer that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.3 FINAL CLEANING OF SITES

- A. Execute final cleaning prior to final inspection.
- B. Clean site(s) to a condition acceptable to turn over to Owner.
- C. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.4 ADJUSTING

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.5 PROJECT RECORD DOCUMENTS

- A. Maintain on site, one set of the following record documents; record actual revisions to the Work:

1. Contract Drawings.
 2. Specifications.
 3. Addenda.
 4. Change Orders and other Modifications to the Contract.
 5. Reviewed shop drawings, product data, and samples.
- B. Store Record Documents separate from documents used for construction.
- C. Record information concurrent with construction progress.
- D. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
1. Manufacturer's name and product model and number.
 2. Product substitutions or alternates utilized.
 3. Changes made by Addenda and Modifications.
- E. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
1. Field changes of dimension and detail.
 2. Details not on original Contract Drawings.
- F. Delete Architect/Engineer title block and seal from all documents.
- G. Submit documents to Architect/Engineer with claim for final Application for Payment.

1.6 OPERATION AND MAINTENANCE DATA

- A. Submit two sets prior to final inspection, bound in 8-1/2 x 11 inch text pages, three D side ring capacity expansion binders with durable plastic covers.
- B. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.
- C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, type on 30 pound white paper.
- E. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, Subcontractors, and major suppliers.
- F. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
1. Significant design criteria.
 2. Operating instructions as applicable.
 3. Maintenance instructions for equipment and systems.
 4. Maintenance instructions as applicable, including recommended cleaning methods and materials and special precautions identifying detrimental agents.

- G. Part 3: Project documents and certificates, including the following:
 - 1. Shop drawings and product data.
 - 2. Certificates.
 - 3. Photocopies of warranties and bonds.
 - 4. Waiver of Lien from Contractor and all Subcontractors.
 - 5. Final wage reports from Contractor and all Subcontractors.
- H. Submit one copy of completed volumes in final form 15 days prior to final inspection. This copy will be returned after final inspection, with Architect/Engineer comments. Revise content of documents as required prior to final submittal.
- I. Submit final volumes revised, within ten days after final inspection.

1.7 WARRANTIES

- A. Provide duplicate notarized copies.
- B. Execute and assemble documents from Subcontractors, suppliers, and manufacturers.
- C. Provide Table of Contents and assemble in three D side ring binder with durable plastic cover.
- D. Submit prior to final Application for Payment.
- E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

1.8 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification Sections.
- B. Deliver to Project site and place in location as directed; obtain receipt prior to final payment.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 02 41 13
SELECTIVE SITE DEMOLITION

1. PART 1 GENERAL

1.1 WORK INCLUDED

- A. Selective Site Demolition consists of furnishing transportation, labor, materials, and equipment necessary to perform site demolition and removal work required to complete new work. Work includes but is not limited to the following:
 - 1. Concrete removal.
- B. Removal of items for temporary protection and reinstallation.
- C. See Section 01 50 00 Temporary Facilities and Controls for progress cleaning and materials disposal.

1.2 REGULATORY REQUIREMENTS

- A. Conform to applicable code(s) for demolition work, safety of structure, and dust control.
- B. Obtain required permits from authorities.
- C. Verify proper procedures for removal and reinstallation of parking meters and parking signs with authorities having jurisdiction.
- D. Do not close or obstruct egress width to or from entrances or exits.

1.3 SUBMITTALS

- A. Submit a list of procedures, equipment to be utilized, and operational sequences.
- B. Prior to the start of Work, submit photographs of existing conditions, including damage to existing concrete and adjacent items, where such damage could be misconstrued as having been caused by the Contractor.

1.4 QUALIFICATIONS

- A. Demolition Contractor: Company specializing in providing the demolition work specified in this section with a minimum of three (3) years documented experience.

1.5 SALVAGE

- A. No on-site sale of salvage will be permitted. No removals shall be made from the site by any person or persons other than the Contractor.

1.6 SCHEDULING

- A. Schedule work under the provisions of Division 1.
- B. Schedule Work to coincide with new construction.
- C. Describe demolition removal procedures and schedule.
- D. The Contractor shall furnish the Owner with a Schedule for completing the Work for all sites including input from the Owner and Architect.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

3.1 PREPARATION

- A. Provide, erect, and maintain temporary barriers at locations indicated and as required to keep pedestrian and vehicular traffic away from new work during construction. Remove all barriers at the completion of work.
- B. Make special efforts to protect freshly poured concrete from damage, including graffiti, until materials have set sufficiently. The Contractor shall be responsible for replacing all new concrete that has been defaced with graffiti or other malicious damage prior to the setting of concrete.
- C. Protect existing materials and equipment which are not to be demolished.

3.2 REMOVALS

- A. Remove existing concrete pavement including walks, ADA ramps, drive approaches, and curbs, to the limits as noted on the Drawings.
- B. Removal work shall not exceed the limits shown on the Drawings. Limits of removal shall be along straight lines, and may be along existing expansion joints, cold joints, or score lines, as identified in concrete panels and/or curbs.
- C. Where the limit of removal is along an existing score line, the new joint shall be neatly cut to provide a straight and uniform edge.

- D. Additional subgrade material shall be excavated to achieve total base and concrete depths as shown on Drawings.
- E. Where the plans for reconstruction of existing curb and/or walk and the limits of the new work specified do not fall on a score line, the entire section shall be removed and the new work shall be connected to the existing work at the nearest score line beyond that which is specified.
- E. The Contractor shall notify the Architect when tree roots are exposed during concrete removal. The City of Toledo will be notified to determine the course of action.
- F. Repair or replace surfaces removed or damaged as a result of operations related to new work.
- G. Identify items to be removed prior to demolition procedures and reset after the completion of work, such as benches, posts, etc. Identify items such as parking meters and signs that will require temporary removal and replacement. Verify procedures with proper authority.

3.3 SAFETY AND PROTECTION

- A. Protect existing buildings, substructures, and other improvements within and adjacent to the area of construction.
- B. Provide, erect, and maintain barriers, barricades, and guard rails as necessary to protect pedestrians, vehicles, and adjacent property.
- C. Identify site items to be affected by scheduled demolition and construction work, including sprinkler heads and lines near or in work areas. Notify Owner immediately and resolve prior to proceeding.
- D. Take care not to damage utilities, valves, sprinkler heads, and other items to remain in or near area of construction.

END OF SECTION

SECTION 31 10 00

SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Protecting existing trees, shrubs, plants and grass to remain.
 - 2. Removing and reinstalling soils related to new concrete work.

1.3 DEFINITIONS

- A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.
- B. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.4 MATERIAL OWNERSHIP

- A. Except for stripped topsoil or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
- B. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

- C. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

1.6 QUALIFICATIONS

- A. Site Clearing Contractor: Company specializing in providing the site clearing work specified in this section with a minimum of three (3) years documented experience.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 31 Section "Earth Moving."
 - 1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.
- C. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

3.2 TREE PROTECTION

- A. Do not excavate within tree protection zones, unless otherwise indicated. Notify Architect of any excavation required that may jeopardize trees, shrubs, or root systems.
- B. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.
 - 1. Cover exposed roots with burlap and water regularly.
 - 2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
 - 3. Backfill with soil as soon as possible.
- C. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.

1. Replace trees that cannot be repaired and restored to full-growth status, as determined by Owner.

3.3 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically. Verify with Architect prior to performing such work.
 2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.
- C. Remove from or add to subgrade and base materials as required to achieve appropriate final grades.
- D. Fill depressions caused by these operations with satisfactory soil materials unless further excavation or earthwork is indicated.
 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

3.4 DISPOSAL

- A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

END OF SECTION

SECTION 31 20 11

EARTH MOVING

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This section specifies the requirements for furnishing all equipment, materials, labor and techniques for earthwork including excavation, fill and backfill, and site restoration.

1.2 DEFINITIONS

- A. Unsuitable Materials:
 - 1. Fills: Topsoil, frozen materials; construction materials and materials subject to decomposition; clods of clay and stones larger than 75 mm (3 inches); organic materials, including silts, which are unstable; and inorganic materials, including silts, too wet to be stable.
 - 2. Existing Subgrade: Same materials as above paragraph, that are not capable of direct support of slabs, pavement, and similar items, with the possible exception of improvement by compaction, proofrolling, or similar methods of improvement.
- B. Earthwork: Earthwork operations required within the new construction area. It also includes earthwork required for auxiliary structures and buildings and sewer and other trench work throughout the job site.
- C. Degree of Compaction: Degree of compaction is expressed as a percentage of maximum density obtained by the test procedure presented in AASHTO T99 T180 Method A. ASTM D698 D1557 Method A.
- D. The term fill means fill or backfill as appropriate.

1.3 CLASSIFICATION OF EXCAVATION

- A. Unclassified Excavation: Removal and disposal of pavements and other man-made obstructions visible on the surface; utilities, and other items including underground structures indicated to be demolished and removed; together with any type of materials regardless of character of material and obstructions encountered.

1.4 QUALIFICATIONS

- A. Earth Moving Contractor: Company specializing in providing the earth moving work specified in this section with a minimum of three (3) years documented experience.

2 PART 2 - PRODUCTS

2.1 MATERIALS

- A. Fills: Materials approved from on site and off site sources having a minimum dry density of 1760 kg/m³ (110 pcf), a maximum Plasticity Index of 6, and a maximum Liquid Limit of 30.
- B. Granular Fill:
 - 1. Under concrete slab, crushed stone or gravel graded from 25 mm (1 inch) to 4.75 mm (No. 4).
 - 2. Bedding for sanitary and storm sewer pipe, crushed stone or gravel graded from 13 mm (1/2 inch) to 4.75 mm (No. 4).
- C. Fertilizer, Seed, and Sod: See Specification Section 32 92 00 Turf and Grasses.

PART 3 - EXECUTION

3.1 SITE PREPARATION

- A. Clearing: Clearing within the limits of earthwork operations as described or designated. Work includes removal of existing paving as identified, vegetation, debris, trash and any other obstructions.
- B. Grubbing: Remove stumps and roots 75 mm (3 inches) and larger diameter. Undisturbed sound stumps, roots up to 75 mm (3 inches) diameter, and nonperishable solid objects which will be a minimum of 900 mm (3 feet) below subgrade or finished embankment may be left.
- C. Stripping Topsoil: Unless otherwise indicated on the drawings, the limits of earthwork operations shall extend anywhere the existing grade is filled or cut or where construction operations have compacted or otherwise disturbed the existing grade or turf. Remove foreign material, such as weeds, roots, stones, subsoil, frozen clods, and similar foreign materials, larger than 0.014 m³ (1/2 cubic foot) in volume, from soil as it is stockpiled. Remove foreign materials larger than 50 mm (2 inches) in any dimension from topsoil used in final grading. Topsoil work, such as stripping, stockpiling, and similar topsoil work, shall not, under any circumstances, be carried out when the soil is wet so that the tilth of the soil will be destroyed.
- D. Concrete Slabs and Paving: Score deeply or saw cut to insure a neat, straight cut, sections of existing concrete slabs and paving to be removed where excavation or trenching occurs. Extend pavement section to be removed a minimum of 300 mm (12 inches) on each side of widest part of trench excavation and insure final score lines are approximately parallel unless otherwise indicated.
- E. Disposal: All materials removed from the property shall be disposed of at a legally approved site, for the specific materials, and all removals shall be in accordance with all applicable Federal, State and local regulations. No burning of materials is permitted onsite.

3.2 EXCAVATION

- A. Site Earthwork: Excavation shall be accomplished as required by drawings and specifications. Remove subgrade materials, that are determined as unsuitable, and replace with acceptable material. If there is a question as to whether material is unsuitable or not, the Contractor shall obtain samples of the material, which shall be examined by an independent testing laboratory for soil classification to determine whether it is unsuitable or

not.

- B. Finished elevation of subgrade shall be as follows:
 - 1. Pavement Areas - bottom of the pavement or base course as applicable.
 - 2. Planting and Lawn Areas - 100 mm (4 inches) below the finished grade, unless otherwise specified or indicated on the drawings.

3.3 FILLING AND BACKFILLING

- A. General: Do not fill or backfill until all debris, unsatisfactory soil materials, obstructions, and deleterious materials have been removed from the excavation. Proof-roll exposed subgrades with appropriate equipment. Use excavated materials or borrow for fill and backfill, as applicable. Do not use unsuitable excavated materials.
- B. Proof-rolling Existing Subgrade: Proof-roll with appropriate equipment. Make a minimum of one pass in each direction. Remove unstable uncompactable material and replace with granular fill material completed to mix requirements specified.
- C. Placing: Place material in horizontal layers not exceeding 200 mm (8 inches) in loose depth and then compacted. Do not place material on surfaces that are muddy, frozen, or contain frost.
- D. Compaction: Use approved equipment (hand or mechanical) well suited to the type of material being compacted. Moisten or aerate material as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used. **Compact each layer until there is no evidence of further compaction to not less than 95 percent of the maximum density determined in accordance with the following test method AASHTO T99 T180 Method A ASTM D698 D1557 Method A.**

3.4 GRADING

- A. General: Uniformly grade the areas within the limits of this section, including adjacent transition areas. Smooth the finished surface within specified tolerance. Provide uniform levels or slopes between points where elevations are indicated, or between such points and existing finished grades. Provide a smooth transition between abrupt changes in slope.
- B. Place crushed stone or gravel fill under concrete slabs on grade tamped and leveled. The thickness of the fill shall be 150 mm (6 inches), unless otherwise indicated.
- C. Finish subgrade at least one day in advance of the paving operations. Maintain finished subgrade in a smooth and compacted condition until the succeeding operation has been accomplished. Scarify, compact, and grade the subgrade prior to further construction when approved compacted subgrade is disturbed by Contractor's subsequent operations or adverse weather.

3.5 LAWN AREAS

- A. General: Harrow and till to a depth of 100 mm (4 inches), new or existing lawn areas to remain, which are disturbed during construction. Establish existing or design grades by dragging or similar operations. Do not carry out lawn areas earthwork when the soil is wet so that the tilth of the soil will be destroyed. Obtain approval before seeding or sodding operation begins.

- B. Finished Grading: Begin finish grading after rough grading has had sufficient time for settlement. Scarify subgrade surface in lawn areas to a depth of 100 mm (4 inches). Apply topsoil so that after normal compaction, dragging and raking operations (to bring surface to indicated finish grades) there will be a minimum of 100 mm (4 inches) of topsoil over all lawn areas; make smooth, even surface and true grades, which will not allow water to stand at any point. Shape top and bottom of banks to form reverse curves in section; make junctions with undisturbed areas to conform to existing topography.

3.6 DISPOSAL OF UNSUITABLE AND EXCESS EXCAVATED MATERIAL

- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off property.
- B. Place excess excavated materials suitable for fill and/or backfill on site where directed by Architect.
- C. Remove from site and dispose of any excess excavated materials after all fill and backfill operations have been completed.
- D. Segregate all excavated contaminated soil from all other excavated soils, and stockpile on site on two 0.15 mm (6 mil) polyethylene sheets with a polyethylene cover. A designated area shall be selected for this purpose. Dispose of excavated contaminated material in accordance with State and Local requirements.

3.6 CLEAN-UP

- A. Upon completion of earthwork operations, clean areas within contract limits, remove tools, and equipment. Provide site clear, clean, free of debris, and suitable for subsequent construction operations. Remove debris, rubbish, and excess material from the property.

END OF SECTION

SECTION 32 01 29
CONCRETE PAVING RAISING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Raising concrete flatwork to grade.

1.3 REFERENCES

- A. ASTM C150 - Standard Specifications for Portland Cement.

1.4 SUBMITTALS

- A. Plan for containing mud in the jacking process.
- B. Data sheet for shrinkage resistant grout.

1.5 QUALIFICATIONS

- A. Concrete Paving Raising Contractor: Company specializing in providing the concrete paving raising work specified in this section with a minimum of five (5) years documented experience.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Grout: Cement based shrink resistant.
 - 1. Grade B or C premixed, non-metallic, non-gaseous product; ASTM C 1107 at a fluid consistency of 20 to 30 seconds. Thirty-minute-old grout shall flow through flow cone after slight agitation, in temperatures of 40° F. to 90° F.

2. Bleeding: None.
 3. Compressive Strength: 6,500 to 9,000 psi, ASTM C 109 in 28 days.
 4. Non-shrink percentage: 0.5 percent, ASTM C 1090.
- B. Cement Slurry Mixture: The slurry mixture used for raising concrete slabs shall be composed of lime, sand, ground clay, Portland Cement (Type 1A conforming to ASTM C 150), and fly ash in the following proportions by volume:
- | | |
|---|-----|
| Lime/Fly Ash Mixture passing #50 sieve 100% | 27% |
| Sand passing #4 sieve 100% | 15% |
| Ground clay passing #4 sieve 100% | 50% |
| Portland Cement | 8% |
1. Aggregate shall be metered for precise mix design to assure consistency of material, and by way of a continuous mixer.
 2. Slurry material for slab and/or curb raising shall be mixed with sufficient potable water to be of a workable consistency. Material shall be utilized within one hour of original mixing process.
 3. Holes drilled for injection pumping shall be repaired utilizing a mixture of Type 1A Portland Cement and masons sand in 2 to 1 proportion.
- C. Equipment: Mixing equipment shall be a self-contained continuous mixer with calibrated mixing and delivery capability, carrying all water, cement, and aggregate required for the project. The continuous mixer shall meet or exceed the Standards of Calibration as set forth by the Volumetric Mixer Manufacturer Bureau, and conforming to ASTM 685 and ACI 304.6.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine areas to receive concrete slab raising. Verify that the completed work will slope for proper drainage. Notify Architect of any anticipated problems prior to beginning work.
- B. Verify on completion of new work that all raised panels and adjacent panels are true, flush, and in alignment.

3.2 DRILLING OF SLABS

- A. Contractor shall drill holes for concrete injection by whatever means are familiar and adequate. Contractor shall exercise caution to prevent cracking of slabs.
- B. Holes drilled in concrete slabs shall be a minimum of 1 inch and a maximum of 2 inches in diameter.

- C. Holes shall be spaced as necessary to assure complete communication of slurry mixture between holes. Holes shall be spaced neatly and uniformly.

3.3 SLAB RAISING AND LEVELING

- A. Slabs shall be raised to the required slope and alignment, pitching at $\frac{1}{4}$ inch per 12 inches where possible. Conditions that create areas of ponding or other unacceptable conditions will not be permitted.
- B. If required, additional sawcuts shall be made at existing joints in panels or curbs to permit free movement of the work.

3.4 HOLE PATCHING

- A. Holes shall be cleaned the full depth of concrete by removing excess slurry. Apply a wire brush to the concrete surface to remove foreign substances. Wire brush the surfaces additional times as necessary. Dampen concrete surface prior to installing patching material.

3.5 PROTECTION AND CLEANUP

- A. Protect all areas of work from pedestrian and vehicular traffic until all slurry and patching materials have set.
- B. Clean all new work prior to turning over to the Owner.

END OF SECTION

SECTION 32 13 13

CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes exterior cement concrete pavement for the following:
 1. Sidewalks.
 2. Curbs and Curbcuts.
 3. Estimated square footage information.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with blended hydraulic cement.

1.4 SUBMITTALS

- A. Product Data: For each type of manufactured material and product indicated.
- B. Qualification Data: For manufacturer.
- C. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:
 1. Cementitious materials.
 2. Fiber reinforcement.
 3. Admixtures.
 4. Curing compounds.
 5. Applied finish materials.
 6. Joint fillers.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

- B. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.
- C. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.
- D. **Concrete Testing Service: The Contractor shall include in their Contract the cost for engaging a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.**
- E. Mockups: Cast mockups of full-size sections of concrete pavement to demonstrate typical joints, surface finish, texture, color, and standard of workmanship shall be furnished by the Contractor for any and all sites when requested by the Architect.
 - 1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
 - 2. Notify Owner seven days in advance of dates and times when mockups will be constructed.
 - 3. Obtain owner's approval of mockups before starting construction.
 - 4. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavement.
 - 5. Demolish and remove approved mockups from the site when directed by Owner.
 - 6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required during construction activities.

1.7 QUALIFICATIONS

- A. Concrete Paving Contractor: Company specializing in providing the concrete paving work specified in this section with a minimum of five (5) years documented experience.

PART 2 - PRODUCTS

2.1 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
 - 1. Use flexible or curved forms for curves with a radius 100 feet or less.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

- A. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
- B. Plain Steel Wire: ASTM A 82, galvanized.
- C. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.

2.3 CONCRETE MATERIALS

- A. Concrete: ODOT 499 Class C (ASTM Class A) concrete all work unless noted otherwise.
 - 1. 4,000 psi compressive strength at 28 days.
 - 2. Air Content: 6% - 8%.
 - 3. Minimum Cement Content: 564 lbs./cu. yd. concrete.
 - 4. Slump: 4 inches, plus or minus 1/2 inch.
- B. Cementitious Material: Use the following Cementitious materials, of the same type, brand, and source throughout the Project:
 - 1. Portland Cement: ASTM C 150, Type I
- C. Normal-Weight Aggregates: ASTM C 33, coarse aggregate, uniformly graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: 1 inch nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Water: ASTM C 94/C 94M.
- E. Air-Entraining Admixture: ASTM C 260.
- F. Synthetic Fiber: monofilament polypropylene fibers engineered and designed for use in concrete pavement, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 long.

2.4 FIBER REINFORCEMENT

- A. Synthetic Fiber: Monofilament or fibrillated polypropylene fibers engineered and designed for use in concrete pavement, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches long.
 - 1. Products:
 - a. Monofilament Fibers:
 - 1) Axim Concrete Technologies; Fibrasol IIP.
 - 2) Euclid Chemical Company (The); Fiberstrand 100.
 - 3) FORTA Corporation; Forta Mono.
 - 4) Grace, W. R. & Co.--Conn.; Grace MicroFiber.
 - 5) Metalcrete Industries; Polystrand 1000.
 - 6) SI Concrete Systems; Fibermix Stealth.
 - b. Fibrillated Fibers:
 - 1) Axim Concrete Technologies; Fibrasol F.
 - 2) FORTA Corporation; Forta.
 - 3) Euclid Chemical Company (The); Fiberstrand F.
 - 4) Grace, W. R. & Co.--Conn.; Grace Fibers.

5) SI Concrete Systems; Fibermesh.

2.5 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
 - 1. Available Products:
 - a. Axim Concrete Technologies; Cimfilm.
 - b. Burke by Edeco; BurkeFilm.
 - c. ChemMasters; Spray-Film.
 - d. Conspec Marketing & Manufacturing Co., Inc.; Aquafilm.
 - e. Dayton Superior Corporation; Sure Film.
 - f. Euclid Chemical Company (The); Eucobar.
 - g. Kaufman Products, Inc.; Vapor Aid.
 - h. Lambert Corporation; Lambco Skin.
 - i. L&M Construction Chemicals, Inc.; E-Con.
 - j. MBT Protection and Repair, ChemRex Inc.; Confilm.
 - k. Meadows, W. R., Inc.; Sealtight Evapre.
 - l. Metalcrete Industries; Waterhold.
 - m. Nox-Crete Products Group, Kinsman Corporation; Monofilm.
 - n. Sika Corporation, Inc.; SikaFilm.
 - o. Symons Corporation; Finishing Aid.
 - p. Vexcon Chemicals, Inc.; Certi-Vex EnvioAssist.
- B. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
 - 1. Available Products:
 - a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
 - b. Burke by Edoko; Aqua Resin Cure.
 - c. ChemMasters; Safe-Cure Clear.
 - d. Conspec Marketing & Manufacturing Co., Inc.; W.B. Resin Cure.
 - e. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).
 - f. Euclid Chemical Company (The); Kurez DR VOX.
 - g. Kaufman Products, Inc.; Thinfilm 420.
 - h. Lambert Corporation; Aqua Kure-Clear.
 - i. L&M Construction Chemicals, Inc.; L&M Cure R.
 - j. Meadows, W. R., Inc.; 1100 Clear.
 - k. Nox-Crete Products Group, Kinsman Corporation; Resin Cure E.
 - l. Symons Corporation; Resi-Chem Clear.
 - m. Tamms Industries Inc.; Horncure WB 30.
 - n. Unitex; Hydro Cure 309.

2.6 RELATED MATERIALS

- A. Expansion and Isolation-Joint-Filler Strips: See Specification Section 32 13 73 Concrete Paving Joint Sealers.
- B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

- C. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to requirements, and as follows:
 - 1. Types I and II, non-load bearing and Type IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.7 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.
 - 1. Use a qualified independent testing agency for preparing and reporting proposed concrete mixture designs for the trial batch method.
- B. Proportion mixtures to provide normal-weight concrete with the following properties:
 - 1. Compressive Strength (28 Days): 4000 psi.
 - 2. Maximum Water/Cementitious Materials Ratio at Point of Placement: 0.45.
 - 3. Slump Limit: 4 inches, plus or minus 1/2 inch.
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:
 - 1. Air Content: 6 percent plus or minus 1.5 percent for 1-inch nominal maximum aggregate size.
- D. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd.

2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ASTM C 1116. Furnish batch certificates for each batch discharged and used in the Work.
 - 1. When air temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

2.9 BRICK TACTILE REPAIR AND REPLACEMENT

- A. Cast-In-Place Tactile: 24 inch by 36 inch cast-in-place tactile tiles (wet set). Color as per City of Toledo standards. Basis of design: ADA Solutions, Inc. or approved equal.
- B. Installation Procedures:
 - 1. The physical characteristics of the concrete shall be as specified, while maintaining a slump range to permit the solid placement of the tactile unit in the wet cement.
 - 2. The concrete shall be poured and finished level, true, and smooth to the required dimensions prior to the placement of the tactile unit.
 - 3. Place the tactile unit 6 inches from the curb line, or line of pavement where no curb occurs. Working in a grid pattern, tamp the tactile unit into the wet concrete using a rubber mallet and a piece of wood. Continue this process until all air has been released,

and the tactile unit surface is flush with the surrounding area. Do not strike the tactile unit directly.

4. After tile is installed, allow for expansion by the use of a ¼ inch finish edge trowel at the entire perimeter of the tactile unit. Where tactile units are placed side-by-side, space units 1/8 inch apart.
5. Follow manufacturer's instructions for holding tactile unit in place during curing period. Protect area from pedestrian and other traffic during this time. Remove protective plastic covering when work is complete and concrete is cured.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine exposed subgrade and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Examine exposed subgrade and subbase surfaces for compliance with requirements for compaction (See Section 31 20 11 Earth Moving).
- C. Where additional subgrade and/or subbase are required, or where existing subgrade and/or subbase do not meet minimum compaction standards, proof-roll subbase surface below concrete pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding.
 1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph.
 2. Proof-roll with a loaded 10-wheel tandem-axle dump truck weighing not less than 15 tons
 3. Subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch requires correction according to requirements in Section 31 20 11 Earth Moving.
- D. Proceed with concrete pavement operations only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

- A. General: Comply with CSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

3.5 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
 - 1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.
 - 1. Butt Joints: Use bonding agent at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
 - 1. For longer lengths of pavement, locate expansion joints at intervals of 30 feet, unless otherwise indicated.
 - 2. Extend joint fillers full width and depth of joint.
 - 3. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
 - 4. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
 - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch radius. Tool shall penetrate $\frac{1}{4}$ of concrete thickness. Finish for each panel shall match the finish of the larger portion of existing adjacent pavement. **Sawed joints will not be permitted at newly poured concrete joints.**
 - 2. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a 1/4-inch radius. Tool shall penetrate $\frac{1}{4}$ of concrete thickness.

3.6 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.

- B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.
- E. Do not add water to concrete during delivery or at Project site.
- F. Do not add water to fresh concrete after testing.
- G. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- H. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
 - 1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.
- I. Where steel reinforcing is specified, place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay steel reinforcing immediately in final position. Place top layer of concrete, strike off, and screed.
 - 1. Remove and replace concrete that has been placed for more than 15 minutes without being covered by top layer, or use bonding agent if approved by Architect.
- J. Screed pavement surfaces with a straightedge and strike off.
- K. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- L. Walkways: All new concrete sidewalks to be a minimum of 4 inches thick (or match existing walk thickness where more than 4 inches), with expansion joints at intervals of approximately thirty (30) feet and tooled control joints at intervals equal to existing adjacent walk panels, and a maximum of 6' o.c. Pitch walks ¼" per ft. for drainage where possible. Confirm that ponding will not occur within field of new or existing concrete as a result of new work.
- M. Curbs and Gutters: Submit mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and replace with formed concrete.
- N. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
 1. Concrete Finishing: Match existing adjacent surface finish for new concrete paving, including finish, picture framing, aggregate exposure, etc. If several existing adjacent finishes exist, notify Architect prior to finishing. Verify that final finish meets City of Toledo Standards.
 2. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

3.8 PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- C. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
 1. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.9 PAVEMENT TOLERANCES

- A. Comply with tolerances of ACI 117 and as follows:
 1. Elevation: 1/4 inch .
 2. Thickness: Plus 3/8 inch , minus 1/4 inch .
 3. Surface: Gap below 10-foot long, unlevelled straightedge not to exceed 1/4 inch.
 4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch.
 5. Vertical Alignment of Tie Bars and Dowels: 1/4 inch.
 6. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches.
 7. Joint Spacing: 3 inches.
 8. Contraction Joint Depth: Plus 1/4 inch, no minus.
 9. Joint Width: Plus 1/8 inch, no minus.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor shall be responsible for engaging a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports. Reports shall be forwarded to Architect weekly as available.**
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain at least 1 composite sample for each 50 cu. yd. or 500 sq. ft. or fraction thereof of each concrete mix placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
 4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
 5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
 6. Compressive-Strength Tests: ASTM C 39/C 39M; test 1 specimen at 7 days and 2 specimens at 28 days.
 - a. A compressive-strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at 28 days.
- C. Strength of each concrete mix will be satisfactory if average of any 3 consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- D. Test results shall be reported in writing to Architect, Concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
- F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
- G. Remove and replace concrete pavement where test results indicate it does not comply with specified requirements.
- H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement as noted on Drawings.
- B. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material.

APPROXIMATE AREAS OF CONCRETE

FOR INFORMATIONAL PURPOSES ONLY

<u>Location Reference</u>	<u>New Walk</u>	<u>New Curb</u>	<u>Raised Concrete</u>
Area A (Base Bid) (Courthouse)	6,350 SF	115 LF	2,650 SF
Area B (Base Bid) (Corrections Center/Former Court of Appeals)	1,460 SF	25 LF	125 SF
Area C (Alt. G-1) (CTF/YTC/Work Release)	1,700 SF		230 SF
Area D (Alt. G-2) (Family Court Center)	125 SF		200 SF
Area E (Alt. G-3) (Juvenile Justice Center)	550 SF	70 LF	310 SF
Area F (Alt. G-4) Vehicle Maintenance)	690 SF		70 SF
Area G (Alt. G-5) (Spencer Township NDC)	420 SF	10 LF	60 SF
Total	11,295 SF	220 LF	3,645 SF

Areas listed above are approximate and for informational purposes only. Contractors are required to field verify all location square footages for both new concrete and raised concrete quantities. Bids shall be based on actual location square footage.

END OF SECTION

SECTION 32 13 73

CONCRETE PAVING JOINT SEALANTS

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Expansion and contraction joints in Portland cement concrete pavement.

1.2 SUBMITTALS

- A. Product Data: For each joint sealant product indicated.
- B. Samples for Verification: For each type and color of joint sealant required. Install joint sealant samples in ½ inch wide joints formed between two 6 inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- C. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.
- D. Compatibility and Adhesion Test Reports: From sealant manufacturer.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer with five years documented experience acceptable to product manufacturer.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.5 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 degrees F.
2. When joint substrates are wet or covered with frost.
3. Where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 QUALIFICATIONS

- A. Concrete Paving Joint Sealant Contractor: Company specializing in providing the concrete paving joint sealant work specified in this section with a minimum of five (5) years documented experience.

2 PART 2 – PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint sealant manufacturer based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 COLD-APPLIED JOINT SEALANTS

- A. Type NS Silicone Sealant for Concrete: Single-component, low-modulus, neutral curing, nonsag silicone sealant complying with ASTM D 5893 for Type NS. Product shall be in conformance with ODOT Standards. Provide one of the following products if they meet or exceed the requirements of these specifications:
 1. Crafcoc Inc. RoadSaver Silicone.
 2. Dow Corning Corporation; 888.
 3. Tremco Inc.; Spectrem 800.

2.3 SELF-LEVELING POLYURETHANE SEALER

- A. Provide two or more part, self-leveling, polyurethane based elastomeric sealer, complying with ASTM C920 Type M, Grade P, Class 25, having Shore A hardness of not less than 55 when tested according to ASTM D2240, cured modulus of elasticity at 100 percent elongation of not more than 150 psi when tested according to ASTM D412, and tear resistance of not less than 50 lbs./inch when tested according to ASTM D624. Provide one of the following products if they meet or exceed the requirements of these specifications:
 1. Pecora Urepan NR-200.
 2. Tremco THC 900/901.
 3. Sika 1A, SL.

2.4 JOINT SEALANT BACKER MATERIAL

- A. General: Provide joint sealant backer materials that are nonstaining, are compatible with joint substrates, sealants, primers, and other joint fillers, and are approved for applications indicated by joint sealant manufacturer based on field experience and laboratory testing.

2.5 PRIMERS

- A. Primers: Product recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant substrate tests and field tests.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions.
- B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint sealant manufacturer, based on preconstruction joint sealant substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of backer materials.
 - 2. Do not stretch, twist, puncture, or tear backer materials.
 - 3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.

- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed.
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses provided for each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

- E. Tooling of Nonsag Sealants: Immediately after sealant application, and before curing or skinning begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joints.
 - 1. Remove excess sealants from surfaces adjacent to joint.
 - 2. Use tooling agents that are approved in writing by joint sealant manufacturer and that do not discolor sealants or adjacent surfaces.

- F. Provide joint configuration to comply with joint sealant manufacturer's written instructions, unless otherwise indicated.

- G. Provide recessed joint configuration for silicone sealants of recess depth and at locations indicated.

3.4 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturer of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion.

- B. If damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations with repaired areas are indistinguishable from the original work.

END OF SECTION

SECTION 32 92 00

TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Seeding.
 - 2. Sod.

1.3 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Manufactured Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- C. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.
- D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.
- E. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
 - 1. Certification of each seed mixture, identifying source, including name and telephone number of supplier.
- C. Qualification Data: For qualified landscape Installer.

- D. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of lawns during a calendar year. Submit before expiration of required initial maintenance periods.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.
- B. Sod: Harvest, deliver, store, and handle sod according to requirements in TPI's "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in its "Guideline Specifications to Turfgrass Sodding." Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.

1.6 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.7 QUALIFICATIONS

- A. Turf and Grasses Contractor: Company specializing in providing the turf and grasses work specified in this section with a minimum of three (3) years documented experience.

PART 2 - PRODUCTS

2.1 SEED

- A. The Contractor shall guarantee the production of a healthy, uniform, close stand of grass; free of weeds and insects.
- B. Bare spots of more than 2 percent of the total shall be unacceptable and the contractor shall reseed following the specification for the initial installation.
- C. Seed Blend No. 1 - Lawns: Seed mix is available from Lofts Seed, Inc., (513-382-1127). Local Suppliers: Titgemeir's (419-243-3731), The Andersons (419-473-3232) is specified as the Basis of Design. Equivalent products of other suppliers are acceptable.
 - 80% (By Weight) Turf type tall fescue
 - 10% (By Weight) Kentucky Bluegrass
 - 10% (By Weight) Perennial RyegrassTOPSOIL
- D. Topsoil: Natural, fertile, sandy loam soil capable of sustaining vigorous plant growth and of uniform composition throughout.

2.2 FERTILIZER

- A. Bone meal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 20 percent phosphoric acid.
- B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 - 1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
 - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.
- D. Slow-Release Fertilizer: Granular or pellet fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 - 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
 - 1. Protect adjacent and adjoining areas from hydro-seeding and hydro-mulching overspray.
 - 2. Protect grade stakes set by others until directed to remove them.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and

rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.

- D. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- E. Before planting, restore areas if eroded or otherwise disturbed after finish grading.

3.3 SEEDING

- A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
 - 1. Do not use wet seed or seed that is moldy or otherwise damaged.
 - 2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.
- B. Sow seed at a total rate of 3 to 4 lb/1000 sq. ft.
- C. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.
- D. Protect seeded areas with slopes exceeding 1:4 with erosion-control blankets and 1:6 with erosion-control fiber mesh installed and stapled according to manufacturer's written instructions.
- E. Protect seeded areas with erosion-control mats where shown, installed and anchored according to manufacturer's written instructions.
- F. Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Retain one of two subparagraphs below for anchoring or bonding straw against erosion.
 - 1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.
- G. Protect seeded areas from hot, dry weather or drying winds by applying topsoil within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a depth of 3/16 inch and roll surface smooth.

3.4 HYDROSEEDING

- A. Hydro-seeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydro-seed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.
 - 1. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate.

3.5 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris, created by lawn work, from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after lawn is established.
- C. Remove non-degradable erosion-control measures after grass establishment period.

END OF SECTION