Project Manual

DATE: August 14, 2024

CITY OF DAYTON
NEW POLICE STATION – WEST PATROL DISTRICT
10 Abbey Avenue
Dayton, Ohio 45417

SITE PACKAGE

App Architecture
creative focused design

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PROJECT NUMBER: 4205.00

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SECTION 01 1000
SUMMARY

PART 1 GENERAL

1.01 PROJECT

1.01.A. Project Name: 4205.00 City of Dayton New Police Station - West Patrol District

1.01.B. Owner's Name: City of Dayton.

1.01.C. Architect's Name: App Architecture, Inc.

1.01.D. Construction Manager's Name: Brumbaugh Construction, Inc.

1.01.E. Additional Project contact information is specified in Section 00 0103 - Project Directory.

1.01.F. The Project consists of the construction of a new Police Station and other Work indicated in the Contract Documents to include, but not limited to, civil, architectural, structural, fire protection, plumbing, heating, ventilation and air conditioning, electrical, data and communications, safety and security.

1.02 CONTRACT DESCRIPTION

1.02.A. Contract Type: Project will be constructed under a Construction Manager at Risk contract with subcontracts contracted to CMaR.

1.03 WORK BY OWNER

1.03.A. Items noted NIC (Not in Contract) will be supplied and installed by Owner before Date of Substantial Completion. Some items include:

1. Furnishings.
2. Small equipment, including but not limited to fitness equipment.
3. Refer to construction documents for additional items.

1.03.B. Owner will supply and install the following:

1. Refer to the matrices located on the drawings.

1.03.C. Owner will supply the following for installation by Contractor:

1. Refer to the matrices located on the drawings.

1.04 OWNER OCCUPANCY

1.04.A. Owner intends to occupy the Project upon Substantial Completion.

1.04.B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

1.04.C. Schedule the Work to accommodate Owner occupancy.

1.05 CONTRACTOR USE OF SITE AND PREMISES

1.05.A. Construction Operations: Limited to areas noted on Drawings.
1. Locate and conduct construction activities in ways that will limit disturbance to site.

1.05.B. Arrange use of site and premises to allow:
1. Work by Others.
2. Work by Owner.

1.05.C. Provide access to and from site as required by law and by Owner:
1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
2. Do not obstruct roadways, sidewalks, or other public ways without permit.

1.05.D. Time Restrictions:
1. Limit conduct of the hours of 7:00 a.m. to 5:00 p.m.
2. Weekend Hours: As approved by Owner.
3. Early Morning Hours: As approved by Owner.

END OF SECTION 01 1000

SECTION 01 2100
ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

1.01.A. Contingency allowance.

1.02 RELATED REQUIREMENTS

1.03 CONTINGENCY ALLOWANCE

1.03.A. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Contingency Allowance.

1.03.B. Funds will be drawn from the Contingency Allowance only by Change Order.

1.03.C. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

1.04 ALLOWANCES SCHEDULE

1.04.A. CMaR Contingency Allowance: Include a stipulated sum agreed upon per the contract requirements for the CMaR's use upon Owner's approval during construction.

1.04.B. Owner Contingency Allowance: Include a stipulated sum / price of $75,000 for the Owner's use for potential additional scope items during construction.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2100

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SECTION 01 2200
UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDES

1.01.A. List of unit prices, for use in preparing Bids.

1.01.B. Measurement and payment criteria applicable to Work performed under a unit price payment method.

1.01.C. Defect assessment and non-payment for rejected work.

1.02 RELATED REQUIREMENTS

1.02.A. Document 00 2113 - Instructions to Bidders: Instructions for preparation of pricing for Unit Prices.

1.02.B. Section 01 2000 - Price and Payment Procedures: Additional payment and modification procedures.

1.03 COSTS INCLUDED

1.03.A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.04 UNIT QUANTITIES SPECIFIED

1.04.A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.05 MEASUREMENT OF QUANTITIES

1.05.A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.

1.05.B. Take all measurements and compute quantities. Measurements and quantities will be verified by Architect.

1.05.C. Assist by providing necessary equipment, workers, and survey personnel as required.

1.06 PAYMENT

1.06.A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.

1.06.B. Payment will not be made for any of the following:

1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from the transporting vehicle.
4. Products placed beyond the lines and levels of the required Work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling, and disposing of rejected Products.

1.07 DEFECT ASSESSMENT

1.07.A. Replace Work, or portions of the Work, not complying with specified requirements.

1.07.B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct one of the following remedies:

1. The defective Work may remain, but the unit price will be adjusted to a new unit price at the discretion of Architect.
2. The defective Work will be partially repaired to the instructions of the Architect, and the unit price will be adjusted to a new unit price at the discretion of Architect.

1.07.C. The authority of Architect to assess the defect and identify payment adjustment is final.

1.08 SCHEDULE OF UNIT PRICES

1.08.A. Unit Price No. 1: Removal of unsatisfactory soil and replacement with satisfactory soil material.

1. Description: Unsatisfactory soil excavation and disposal off-site and replacement with satisfactory fill material or engineered fill from off-site, as required, in accordance with Section 31 0000 Earthwork.
2. Unit of Measurement: 200 Cubic Yards of soil excavated, based on in-place surveys of volume before and after removal.

1.08.B. Unit Price No. 2: Mass rock excavation and replacement with satisfactory soil material.

1. Description: Classified mass rock excavation and disposal off-site and replacement with satisfactory fill material or engineered fill from off-site, as required, in accordance with Section 31 2000 Earth Moving.
2. Unit of Measurement: Cubic yard of rock excavated, based on in-place surveys of volume before and after removal.

1.08.C. Unit Price No. 3: Removal of unsatisfactory soil and replacement with low-strength concrete (lsm).

1. Description: Unsatisfactory soil excavation and disposal off-site and replacement with low-strength concrete from off-site, as required, in accordance with Section 31 0000 Earthwork.
2. Unit of Measurement: Cubic yard of soil excavated and replaced, based on 50 cubic yards of lean fill.

1.08.D. Unit Price No. 4: Provide and place lime for the purpose of drying wet soil:

1. Unit of Measurement: Cubic yard of lime based on 500 cubic yards.

1.08.E. Unit Price No. 5: Provide and place 304 gravel:

1. Unit of Measurement: Per ton based on 100 tons.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2200

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SECTION 01 2300
ALTERNATES

PART 1 GENERAL

1.01 SECTION INCLUDES

1.01.A. Description of Alternates.

1.01.B. Procedures for pricing Alternates.

1.01.C. Documentation of changes to Contract Price and Contract Time.

1.02 RELATED REQUIREMENTS

1.02.A. Document 00 2113 - Instructions to Bidders: Instructions for preparation of pricing for Alternates.

1.03 ACCEPTANCE OF Alternates

1.03.A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.

1.03.B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.04 SCHEDULE OF Alternates

1.04.A. As noted or shown in the Contract Documents and Bid Packages.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2300

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SECTION 01 2500
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

1.01.A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

1.02.A. Section 00 2113 - Instructions to Bidders: Restrictions on timing of substitution requests.

1.02.B. Section 01 3000 - Administrative Requirements: Submittal procedures, coordination.

1.02.C. Section 01 6000 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.

1.03 DEFINITIONS

1.03.A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.

1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
    a. Unavailability.
    b. Regulatory changes.
    c. Unavailability of required warranty terms.
2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
    a. Substitution requests offering advantages solely to the Contractor will not be considered.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

3.01.A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.

2. Agrees to provide the same warranty for the substitution as for the specified product.
3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
5. Waives claims for additional costs or time extension that may subsequently become apparent.
6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

3.01.B. A Substitution Request for specified installer constitutes a representation that the submitter:

1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.

3.01.C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.

1. Note explicitly any non-compliant characteristics.

3.01.D. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.

1. No specific form is required. Contractor's Substitution Request documentation must include the following:
   a. Project Information:
      1) Official project name and number, and any additional required identifiers established in Contract Documents.
      2) Owner's, Architect's, and Contractor's names.
   b. Substitution Request Information:
      1) Discrete and consecutive Substitution Request number, and descriptive subject/title.
      2) Indication of whether the substitution is for cause or convenience.
      3) Issue date.
      4) Reference to particular Contract Document(s) specification section number, title, and article/paragraph(s).
      5) Description of Substitution.
      6) Reason why the specified item cannot be provided.
      7) Differences between proposed substitution and specified item.
   c. Attached Comparative Data: Provide point-by-point, side-by-side comparison addressing essential attributes specified, as appropriate and relevant for the item:
      1) Physical characteristics.
      2) In-service performance.
      3) Expected durability.
      4) Visual effect.

5) Warranties.
6) Other salient features and requirements.
7) Include, as appropriate or requested, the following types of documentation:
a) Product Data:
b) Samples.
c) Certificates, test, reports or similar qualification data.
d) Drawings, when required to show impact on adjacent construction elements.

d. Impact of Substitution:
1) Savings to Owner for accepting substitution.
2) Change to Contract Time due to accepting substitution.

3.01.E. Limit each request to a single proposed substitution item.
1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

3.02.A. Submittal Time Restrictions:
1. Section 00 2113 - Instructions to Bidders specifies time restrictions and the documents required for submitting substitution requests during the bidding period.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

3.03.A. Architect will consider requests for substitutions only within 15 days after date of Agreement.

3.03.B. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.

3.03.C. Submit request for Substitution for Convenience within 14 days of discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
3. Bear the costs engendered by proposed substitution of:
a. Owner's compensation to the Architect for any required redesign, time spent processing and evaluating the request.
b. Other construction by Owner.
c. Other unanticipated project considerations.

3.03.D. Substitutions will not be considered under one or more of the following circumstances:
1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
2. Without a separate written request.
3. When acceptance will require revisions to Contract Documents.

3.04 RESOLUTION

3.04.A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.

3.04.B. Architect will notify Contractor in writing of decision to accept or reject request.
1. Architect's decision following review of proposed substitution will be noted on the submitted form cover sheet.

3.05 ACCEPTANCE

3.05.A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.06 CLOSEOUT ACTIVITIES

3.06.A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

3.07 ATTACHMENTS

3.07.A. A facsimile of the Substitution Request Form Cover Sheet (During Construction) required to be used on the Project is included after this section.

END OF SECTION 01 2500

SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

1.01.A. General administrative requirements.

1.01.B. Web-based project software service.

1.01.C. Preconstruction meeting.

1.01.D. Progress meetings.

1.01.E. Construction progress schedule.

1.01.F. Contractor's daily reports.

1.01.G. Coordination drawings.

1.01.H. Submittals for review, information, and project closeout.

1.01.I. Number of copies of submittals.

1.01.J. Requests for Information (RFI) procedures.

1.01.K. Submittal procedures.

1.02 RELATED REQUIREMENTS

1.02.A. Section 00 7200 - General Conditions: Duties of the Brumbaugh Construction, Inc.

1.02.B. Section 00 7300 - Supplementary Conditions: Duties of the Brumbaugh Construction, Inc.

1.02.C. Section 01 6000 - Product Requirements: General product requirements.

1.02.D. Section 01 7000 - Execution and Closeout Requirements: Additional coordination requirements.

1.02.E. Section 01 7800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.02.F. Section 01 9113 - General Commissioning Requirements: Additional procedures for submittals relating to commissioning.

1. Where submittals are indicated for review by both Architect and the Commissioning Authority, submit one extra and route to Architect first, for forwarding to the Commissioning Authority.
2. Where submittals are not indicated to be reviewed by Architect, submit directly to the Commissioning Authority; otherwise, the procedures specified in this section apply to commissioning submittals.

1.03 REFERENCE STANDARDS

1.04 PROJECT COORDINATOR

1.04.A. : Construction Manager.

1.04.B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for access, traffic, and parking facilities.

1.04.C. During construction, coordinate use of site and facilities through the Project Coordinator.

1.04.D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.

1.04.E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 1000 - Summary.

1.04.F. Coordinate field engineering and layout work under instructions of the Project Coordinator.

1.04.G. Make the following types of submittals to Architect through the Project Coordinator:
1. Requests for Information.
2. Requests for substitution.
3. Shop drawings, product data, and samples.
4. Test and inspection reports.
5. Design data.
6. Manufacturer's instructions and field reports.
7. Applications for payment and change order requests.
8. Progress schedules.
9. Coordination drawings.
10. Correction Punch List and Final Correction Punch List for Substantial Completion.
11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 Web-Based Project Software Service

3.01.A. Web-Based Project Software Service: Construction Manager to provide, administer, and use web-based project software to host and manage project communication and documentation.

1. Include, at minimum, the following features:
   a. Project directory, including Owner, Contractor, subcontractors, Architect, Architect's consultants, and other entities involved in the project. Include names of contact persons and contact information for each entity.
   b. Access control for each entity and for each workflow process to determine each entity's digital rights to create, modify, view, and print documents.
   c. Workflow planning, allowing customization of workflow for each project entity.
   d. Creation, logging, tracking, and notification for project communications required in other Specification Sections, including, but not limited to RFI's, submittals, Minor Changes in the Work, Construction Change Directives, and Change Orders.
   e. Tracking of project communication statuses in real time, including timestamped response log.
   f. Procedures for viewing PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
   g. Processing and tracking of payment applications.
   h. Processing and tracking of contract modifications.
   i. Creation and distribution of meeting minutes.
   j. Document management for drawings, specifications, and coordination drawings, including revision control.
   k. Management of construction progress photographs.
   l. Mobile device compatibility.
   m. Creation of data analytics reports.
   n. Creation and export of editable logs for software functions. Provide Owner, Architect, and Architect's consultants with rights and ability to download logs when requested.
2. Provide up to 20 user licenses for use by Owner, Architect, Architect's consultants, and other entities involved in the project.
3. Comply with the software service's current published licensing agreements.
4. Training: Provide one-hour, web-based training session for users of software service. Further training is the responsibility of the user.
   a. Representatives of Owner are scheduled and included in this training.

5. Project Closeout: Provide digital archive in format that is readable by common desktop software applications in format acceptable to Architect. Provide data in locked format to prohibit further changes after completion of the project.
6. Web-Based Project Software Services: Subject to compliance with the requirements use one of the following:

3.02 PRECONSTRUCTION MEETING

3.02.A. Construction Manager will schedule a meeting no later than 10 days after the execution of the Agreement.

3.02.B. Attendance Required:
1. Owner.
2. Architect.
3. Construction Manager.

3.02.C. Agenda:
1. Execution of Owner-Contractor Agreement.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.
4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
5. Submission of initial Submittal schedule.
6. Designation of personnel representing the parties to Contract, Construction Manager and Architect.
7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
8. Scheduling.
9. Scheduling activities of the Special Inspector.

3.02.D. Record minutes and distribute copies within two days after meeting to participants, and those affected by decisions made.

3.03 PROGRESS MEETINGS

3.03.A. Schedule and administer meetings throughout progress of the work at maximum bi-weekly intervals.

3.03.B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

3.03.C. Attendance Required:
1. Construction Manager.
2. Owner.
3. Architect.
4. Contractor's superintendent.

5. Major subcontractors.

3.03.D. Agenda:

1. Review minutes of previous meetings.
2. Review of work progress.
3. Field observations, problems, and decisions.
4. Identification of problems that impede, or will impede, planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of RFIs log and status of responses.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Maintenance of quality and work standards.
11. Effect of proposed changes on progress schedule and coordination.
12. Other business relating to work.

3.03.E. Record minutes and distribute copies within two days after meeting to participants, and those affected by decisions made.

3.04 CONSTRUCTION PROGRESS SCHEDULE

3.04.A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.

3.04.B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

3.04.C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

1. Include written certification that major contractors have reviewed and accepted proposed schedule.

3.04.D. Within 10 days after joint review, submit complete schedule.

3.04.E. Submit updated schedule with each Application for Payment.

3.05 DAILY CONSTRUCTION REPORTS

3.05.A. Include only factual information. Do not include personal remarks or opinions regarding operations and/or personnel.

3.05.B. Prepare a daily construction report recording the following information concerning events at Project site and project progress:

1. Date.
2. High and low temperatures, and general weather conditions.

3. List of subcontractors at Project site.
4. List of separate contractors at Project site.
5. Approximate count of personnel at Project site.
6. Major equipment at Project site.
7. Material deliveries.
8. Safety, environmental, or industrial relations incidents.
9. Meetings and significant decisions.
10. Unusual events (submit a separate special report).
11. Stoppages, delays, shortages, and losses. Include comparison between scheduled work activities (in Contractor's most recently updated and published schedule) and actual activities. Explain differences, if any. Note days or periods when no work was in progress and explain the reasons why.
12. Testing and/or inspections performed.
13. Signature of Contractor's authorized representative.

3.06 COORDINATION DRAWINGS

3.06.A. Provide information required by Project Coordinator for preparation of coordination drawings.

3.06.B. Review drawings prior to submission to Architect.

3.06.C. Architect and consultants will provide CAD or REVIT files as requested for use in producing coordination drawings. Waiver forms are provided at the end of this section and must be completed and signed as part of any request for digital files.

3.07 REQUESTS FOR INFORMATION (RFI)

3.07.A. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.

1. Prepare a separate RFI for each specific item.
   a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
   b. Do not forward requests which solely require internal coordination between subcontractors.
2. Prepare in a format and with content acceptable to Architect.

3.07.B. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.

1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
2. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
   a. Approval of submittals (use procedures specified elsewhere in this section).

b. Approval of substitutions (see Section - 01 6000 - Product Requirements)
c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).

3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
   a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect, and any of its consultants, due to processing of such RFIs.

3.07.C. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
1. Official Project name and number, and any additional required identifiers established in Contract Documents.
2. Owner's, Architect's, and Construction Manager's names.
3. Discrete and consecutive RFI number, and descriptive subject/title.
4. Issue date, and requested reply date.
5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

3.07.D. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

3.07.E. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
1. Indicate current status of every RFI. Update log promptly and on a regular basis.
2. Note dates of when each request is made, and when a response is received.
3. Highlight items requiring priority or expedited response.
4. Highlight items for which a timely response has not been received to date.

3.07.F. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.

1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.

3.07.G. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.

1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.08 SUBMITTAL SCHEDULE

3.08.A. Submit to Architect for review a schedule for submittals in tabular format.

1. Submit at the same time as the preliminary schedule specified in Section 01 3216 - Construction Progress Schedule.
2. Coordinate with Contractor's construction schedule and schedule of values.
3. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
4. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
    a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.09 SUBMITTALS FOR REVIEW

3.09.A. When the following are specified in individual sections, submit them for review:

1. Product data.
2. Shop drawings.
3. Samples for selection.
4. Samples for verification.

3.09.B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

3.09.C. Samples will be reviewed for aesthetic, color, or finish selection.

3.09.D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

3.10 SUBMITTALS FOR INFORMATION

3.10.A. When the following are specified in individual sections, submit them for information:
1. Design data.
2. Certificates.
3. Test reports.
4. Inspection reports.
5. Manufacturer's instructions.
6. Manufacturer's field reports.
7. Other types indicated.

3.10.B. Submit for Architect's knowledge as contract administrator or for Owner.

3.11 SUBMITTALS FOR PROJECT CLOSEOUT

3.11.A. Submit Correction Punch List for Substantial Completion.

3.11.B. Submit Final Correction Punch List for Substantial Completion.

3.11.C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
1. Project record documents.
2. Operation and maintenance data.
3. Warranties.
4. Bonds.
5. Other types as indicated.

3.11.D. Submit for Owner's benefit during and after project completion.

3.12 NUMBER OF COPIES OF SUBMITTALS

3.12.A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

3.12.B. Extra Copies at Project Closeout: See Section 01 7800.

3.12.C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
1. After review, produce duplicates.
2. Retained samples will not be returned to Contractor unless specifically so stated.

3.13 SUBMITTAL PROCEDURES

3.13.A. General Requirements:
1. Use a separate Project Submittal Cover Sheet for each item. Form included at end of this specification section.
2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
3. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
4. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
5. Apply Contractor's stamp, signed or initialed certifying that review, approval, 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.
    a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
6. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
    a. Upload submittals in electronic form to Electronic Document Submittal Service website.
7. Schedule submittals to expedite the Project, and coordinate submission of related items.
    a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
    b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 15 days.
8. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
9. When revised for resubmission, identify all changes made since previous submission.
10. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
11. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.

3.13.B. Product Data Procedures:
1. Submit only information required by individual specification sections.
2. Collect required information into a single submittal.

3. Submit concurrently with related shop drawing submittal.
4. Do not submit (Material) Safety Data Sheets for materials or products.

3.13.C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
2. Do not reproduce Contract Documents to create shop drawings.
3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

3.13.D. Samples Procedures:
1. Transmit related items together as single package.
2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

3.14 SUBMITTAL REVIEW

3.14.A. Submittals for Review: Architect and Cons will review each submittal, and approve, or take other appropriate action.

3.14.B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.

3.14.C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.

3.14.D. Architect's and consultants' actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:
   a. "Reviewed", or language with same legal meaning.
   b. "Reviewed as Noted, Resubmission not required", or language with same legal meaning.
      1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
   c. "Reviewed as Noted, Resubmit for Record", or language with same legal meaning.
2. Not Authorizing fabrication, delivery, and installation:

3.14.E. Architect's and consultants' actions on items submitted for information:
1. Items for which no action was taken:
   a. "Received" - to notify the Contractor that the submittal has been received for record only.
2. Items for which action was taken:

a. "Reviewed" - no further action is required from Contractor.

END OF SECTION 01 3000

SECTION 01 4000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

1.01.A. Submittals.

1.01.B. Quality assurance.

1.01.C. References and standards.

1.01.D. Testing and inspection agencies and services.

1.01.E. Contractor's design-related professional design services.

1.01.F. Control of installation.

1.01.G. Mock-ups.

1.01.H. Tolerances.

1.01.I. Manufacturers' field services.

1.01.J. Defect Assessment.

1.02 RELATED REQUIREMENTS

1.02.A. Document 00 3100 - Available Project Information: Soil investigation data.

1.02.B. Section 01 3000 - Administrative Requirements: Submittal procedures.

1.02.C. Section 01 6000 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCE STANDARDS

1.03.A. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2021.

1.04 DEFINITIONS

1.04.A. Contractor's Professional Design Services: Design of some aspect or portion of the project by party other than the design professional of record. Provide these services as part of the Contract for Construction.

1. Design Services Types Required:

a. Design-Related: Design services explicitly required to be performed by another design professional due to highly-technical and/or specialized nature of a portion of the project. Services primarily involve engineering analysis, calculations, and design, and are not intended to alter the aesthetic aspects of the design.

1.04.B. Design Data: Design-related, signed and sealed drawings, calculations, specifications, certifications, shop drawings and other submittals provided by Contractor, and prepared directly by, or under direct supervision of, appropriately licensed design professional.

1.05 CONTRACTOR'S DESIGN-RELATED PROFESSIONAL DESIGN SERVICES

1.05.A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.

1.05.B. Base design on performance and/or design criteria indicated in individual specification sections.

1. Submit a Request for Interpretation to Architect if the criteria indicated are not sufficient to perform required design services.

1.05.C. Scope of Contractor's Professional Design Services: Provide for the following items of work:

1.06 SUBMITTALS

1.06.A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.06.B. Designer's Qualification Statement: Submit for Architect's knowledge as contract administrator, or for Owner's information.

1. Include information for each individual professional responsible for producing, or supervising production of, design-related professional services provided by Contractor.
   a. Full name.
   b. Professional licensure information.
   c. Statement addressing extent and depth of experience specifically relevant to design of items assigned to Contractor.

1.06.C. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

1. Include calculations that have been used to demonstrate compliance to performance and regulatory criteria provided, and to determine design solutions.
2. Include required product data and shop drawings.
3. Include a statement or certification attesting that design data complies with criteria indicated, such as building codes, loads, functional, and similar engineering requirements.

4. Include signature and seal of design professional responsible for allocated design services on calculations and drawings.

1.06.D. Test Reports: After each test/inspection, promptly submit copies of report to Architect and to Contractor.

1. Include:
   a. Date issued.
   b. Project title and number.
   c. Name of inspector.
   d. Date and time of sampling or inspection.
   e. Identification of product and specifications section.
   f. Location in the Project.
   g. Type of test/inspection.
   h. Date of test/inspection.
   i. Results of test/inspection.
   j. Compliance with Contract Documents.
   k. When requested by Architect, provide interpretation of results.
2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

1.06.E. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.

1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

1.06.F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.

1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

1.07 Quality Assurance

1.07.A. Testing Agency Qualifications:

1. Prior to start of work, submit agency name, address, and telephone number, and names of full-time registered Engineer and responsible officer.
2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
3. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.

1.07.B. Designer Qualifications: Where professional engineering design services and design data submittals are specifically required of Contractor by Contract Documents, provide services of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

1.08 REFERENCES AND STANDARDS

1.08.A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

1.08.B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

1.08.C. Obtain copies of standards where required by product specification sections.

1.08.D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

1.08.E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

1.08.F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.09 Testing and Inspection Agencies and Services

1.09.A. Owner will employ and pay for services of an independent testing agency to perform special tests and inspections required by authorities having jurisdiction as the responsibility of the Owner, as indicated in the Statement of Special Inspections included at the end of this Section and as follows:

1. Notifying Architect and Contractor promptly of any irregularities and deficiencies observed in the Work during performance of its services.
2. Submitting a certified written report of each test, inspection, and similar quality control services to Architect with a copy to Contractor and to authorities having jurisdiction.
3. Retesting and reinspecting corrected Work.

1.09.B. Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

1.09.C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

3.01.A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

3.01.B. Comply with manufacturers' instructions, including each step in sequence.

3.01.C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

3.01.D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

3.01.E. Have work performed by persons qualified to produce required and specified quality.

3.01.F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

3.01.G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

3.02.A. Before installing portions of the Work where mock-ups are required, construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.

3.02.B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.

3.02.C. Notify Architect fifteen (15) working days in advance of dates and times when mock-ups will be constructed.

3.02.D. Provide supervisory personnel who will oversee mock-up construction. Provide workers that will be employed during the construction at Project.

3.02.E. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.

3.02.F. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

3.02.G. Obtain Architect's approval of mock-ups before starting work, fabrication, or construction.
1. Architect will issue written comments within seven (7) working days of initial review and each subsequent follow up review of each mock-up.
2. Make corrections as necessary until Architect's approval is issued.

3.02.H. Architect will use accepted mock-ups as a comparison standard for the remaining Work.

3.02.I. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

3.03 TOLERANCES

3.03.A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

3.03.B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

3.03.C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

3.04.A. See individual specification sections for testing and inspection required.

3.04.B. Testing Agency Duties:
1. Provide qualified personnel at site. Cooperate with Architect and Construction Manager in performance of services.
2. Perform specified sampling and testing of products in accordance with specified standards.
3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
5. Perform additional tests and inspections required by Architect.
6. Submit reports of all tests/inspections specified.

3.04.C. Limits on Testing/Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the Work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the Work.

3.04.D. Construction Manager Responsibilities:

1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
3. Provide incidental labor and facilities:
    a. To provide access to Work to be tested/inspected.
    b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
    c. To facilitate tests/inspections.
    d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

3.04.E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

3.04.F. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.05 MANUFACTURERS' FIELD SERVICES

3.05.A. 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 equipment as applicable, and to initiate instructions when necessary.

3.05.B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

3.06.A. Replace Work or portions of the Work not complying with specified requirements.

3.06.B. If, in the opinion of Architect, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION 01 4000

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SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

1.01.A. Dewatering

1.01.B. Temporary utilities.

1.01.C. Temporary telecommunications services.

1.01.D. Temporary sanitary facilities.

1.01.E. Temporary Controls: enclosures and Barriers, Fencing, Enclosures.

1.01.F. Temporary Fire Protection.

1.01.G. Security requirements.

1.01.H. Vehicular access and parking.

1.01.I. Waste removal facilities and services.

1.01.J. Project identification sign.

1.01.K. Field offices.

1.02 Dewatering

1.02.A. Provide temporary means and methods for dewatering all temporary facilities and controls. Comply with requirements of authorities having jurisdiction.

1.02.B. Maintain temporary facilities in operable condition.

1.03 TEMPORARY UTILITIES

1.03.A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes. Construction Manager to coordinate installation, removal, and use charges. Costs to be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.

1.03.B. New permanent facilities may be used.

1.04 ELECTRONIC COMMUNICATION SERVICES

1.04.A. Provide, maintain, and pay for a secure WiFi wireless connection to internet services to field office at time of project mobilization. Include provisions for access to relevant parties including but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.

1.04.B. Telecommunications services shall include:

1.05 TEMPORARY SANITARY FACILITIES

1.05.A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

1.05.B. Maintain daily in clean and sanitary condition.

1.06 TEMPORARY CONTROLS: BARRIERS, FENCING, ENCLOSURES

1.06.A. BARRIERS

1. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
    a. Provide warning sites and lights as required by authorities having jurisdiction.
2. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
3. Provide protection for plants designated to remain. Replace damaged plants.
4. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.
5. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1.06.B. FENCING

1. Construction: Commercial grade chain link fence.
2. Provide 6 foot (1.8 m) high fence around construction site; equip with vehicular and pedestrian gates with locks.
    a. Extent of Fence: As indicated on the Drawings.
    b. Coordinate with City.

1.06.C. EXTERIOR ENCLOSURES

1. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.07 TEMPORARY FIRE PROTECTION

1.07.A. Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire protection program.

1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition in accordance with requirements of authorities having jurisdiction.

1.08 SECURITY

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

1.09 VEHICULAR ACCESS AND PARKING

1.09.A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

1.09.B. Coordinate access and haul routes with governing authorities and Owner.

1.09.C. Provide and maintain access to fire hydrants, free of obstructions.

1.09.D. Provide means of removing mud from vehicle wheels before entering streets.

1.09.E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.10 WASTE REMOVAL

1.10.A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

1.10.B. Provide containers with lids. Remove trash from site periodically.

1.10.C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

1.10.D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.11 PROJECT IDENTIFICATION

1.11.A. Provide project identification sign of design and construction indicated on drawings.

1.11.B. Erect on site at location indicated.

1.11.C. No other signs are allowed without Owner permission except those required by law.
1. Provide other temporary signs as indicated and as required to inform public and individuals seeking entrance to Project.
2. Maintain and touch up signs, so they are legible at all times.

1.12 FIELD OFFICES

1.12.A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.

1.12.B. Provide space for Project meetings, with table and chairs to accommodate 10 persons.

1.12.C. Locate offices a minimum distance of 30 feet (10 m) from existing and new structures.

1.13 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

1.13.A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.

1.13.B. Remove underground installations to a minimum depth of 2 feet (600 mm). Grade site as indicated.

1.13.C. Clean and repair damage caused by installation or use of temporary work.

1.13.D. Restore new permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 5000

SECTION 01 6000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

1.01.A. General product requirements.

1.01.B. Transportation, handling, storage and protection.

1.01.C. Product option requirements.

1.01.D. Substitution limitations.

1.01.E. Procedures for Owner-supplied products.

1.01.F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

1.02.A. Section 01 1000 - Summary: Identification of Owner-supplied products.

1.02.B. Section 01 2500 - Substitution Procedures: Substitutions made during procurement and/or construction phases.

1.02.C. Section 01 4000 - Quality Requirements: Product quality monitoring.

1.03 DEFINITIONS

1.03.A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product": includes the terms "material," "equipment," "system," and terms of similar intent.

1.03.B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.

1.04 SUBMITTALS

1.04.A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

1.04.B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

1.04.C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 NEW PRODUCTS

2.01.A. Provide new products unless specifically required or permitted by Contract Documents.

2.01.B. See Section 01 4000 - Quality Requirements, for additional source quality control requirements.

2.01.C. Use of products having any of the following characteristics is not permitted:

1. Made using or containing CFC's or HCFC's.

2.01.D. Where other criteria are met, Contractor shall give preference to products that:

1. If used on interior, have lower emissions, as defined in Section 01 6116.
2. If wet-applied, have lower VOC content, as defined in Section 01 6116.

2.02 PRODUCT OPTIONS

2.02.A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

2.02.B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

2.02.C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.03 MAINTENANCE MATERIALS

2.03.A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

2.03.B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

3.01.A. See Section 01 2500 - Substitution Procedures.

3.02 OWNER-SUPPLIED PRODUCTS

3.02.A. See Section 01 1000 - Summary for identification of Owner-supplied products.

3.02.B. Owner's Responsibilities:

1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
2. Arrange and pay for product delivery to site.
3. On delivery, inspect products jointly with Contractor.
4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
5. Arrange for manufacturers' warranties, inspections, and service.

3.02.C. Contractor's Responsibilities:

1. Review Owner reviewed shop drawings, product data, and samples.
2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
3. Handle, store, install and finish products.
4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

3.03.A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

3.03.B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

3.03.C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

3.03.D. Transport and handle products in accordance with manufacturer's instructions.

3.03.E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

3.03.F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

3.03.G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

3.03.H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

3.04.A. Provide protection of stored materials and products against theft, casualty, or deterioration.

3.04.B. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 7419.

1. Structural Loading Limitations: Handle and store products and materials so as not to exceed static and dynamic load-bearing capacities of project floor and roof areas.

3.04.C. Store and protect products in accordance with manufacturers' instructions.

3.04.D. Store with seals and labels intact and legible.

3.04.E. Arrange storage of materials and products to allow for visual inspection for the purpose of determination of quantities, amounts, and unit counts.

3.04.F. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

3.04.G. For exterior storage of fabricated products, place on sloped supports above ground.

3.04.H. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

3.04.I. Comply with manufacturer's warranty conditions, if any.

3.04.J. Do not store products directly on the ground.

3.04.K. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

3.04.L. Prevent contact with material that may cause corrosion, discoloration, or staining.

3.04.M. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

3.04.N. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION 01 6000

SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

1.01.A. Examination, preparation, and general installation procedures.

1.01.B. Pre-installation meetings.

1.01.C. Cutting and patching.

1.01.D. Surveying for laying out the work.

1.01.E. Cleaning and protection.

1.01.F. Starting of systems and equipment.

1.01.G. Demonstration and instruction of Owner personnel.

1.01.H. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

1.02 RELATED REQUIREMENTS

1.02.A. Section 01 3000 - Administrative Requirements: Submittals procedures.

1.02.B. Section 01 4000 - Quality Requirements: Testing and inspection procedures.

1.02.C. Section 01 5000 - Temporary Facilities and Controls: Temporary exterior enclosures.

1.02.D. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.

1.02.E. Section 01 7900 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections

1.02.F. Section 07 8400 - Firestopping.

1.03 REFERENCE STANDARDS

1.03.A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.04 SUBMITTALS

1.04.A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.04.B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.

1. On request, submit documentation verifying accuracy of survey work.
2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
3. Submit surveys and survey logs for the project record.

1.04.C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:

1. Structural integrity of any element of Project.
2. Integrity of weather exposed or moisture resistant element.
3. Efficiency, maintenance, or safety of any operational element.
4. Visual qualities of sight exposed elements.
5. Work of Owner or separate Contractor.

1.05 QUALIFICATIONS

1.05.A. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

1.06 PROJECT CONDITIONS

1.06.A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

1.06.B. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

1.07 COORDINATION

1.07.A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

1.07.B. Notify affected utility companies and comply with their requirements.

1.07.C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

1.07.D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

1.07.E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

1.07.F. Coordinate completion and clean-up of work of separate sections.

1.07.G. 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.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

2.01.A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

2.01.B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

2.01.C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

3.01.A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

3.01.B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

3.01.C. Examine and verify specific conditions described in individual specification sections.

3.01.D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

3.01.E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

3.01.F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

3.02.A. Clean substrate surfaces prior to applying next material or substance.

3.02.B. Seal cracks or openings of substrate prior to applying next material or substance.

3.02.C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

3.03.A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

3.03.B. Require attendance of parties directly affecting, or affected by, work of the specific section.

3.03.C. Notify Architect four days in advance of meeting date.

3.03.D. Prepare agenda and preside at meeting:
1. Review conditions of examination, preparation and installation procedures.
2. Review coordination with related work.

3.03.E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

3.04.A. Verify locations of survey control points prior to starting work.

3.04.B. Promptly notify Architect of any discrepancies discovered.

3.04.C. Contractor shall locate and protect survey control and reference points.

3.04.D. Control datum for survey is that indicated on drawings.

3.04.E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

3.04.F. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

3.04.G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

3.04.H. Utilize recognized engineering survey practices.

3.04.I. Establish a minimum of two permanent benchmarks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.

3.04.J. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:

1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
2. Grid or axis for structures.
3. Building foundation, column locations, ground floor elevations.
4. Controlling lines and levels required for mechanical and electrical trades.

3.04.K. Periodically verify layouts by same means.

3.04.L. Maintain a complete and accurate log of control and survey work as it progresses.

3.04.M. On completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work.

3.05 GENERAL INSTALLATION REQUIREMENTS

3.05.A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

3.05.B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

3.05.C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

3.05.D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

3.05.E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 CUTTING AND PATCHING

3.06.A. Whenever possible, execute the work by methods that avoid cutting or patching.

3.06.B. Perform whatever cutting and patching is necessary to:

1. Complete the work.
2. Fit products together to integrate with other work.
3. Provide openings for penetration of mechanical, electrical, and other services.
4. Match work that has been cut to adjacent work.
5. Repair areas adjacent to cuts to required condition.
6. Repair new work damaged by subsequent work.
7. Remove samples of installed work for testing when requested.
8. Remove and replace defective and non-complying work.

3.06.C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

3.06.D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

3.06.E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

3.06.F. Restore work with new products in accordance with requirements of Contract Documents.

3.06.G. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

3.06.H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.

3.06.I. Patching:

1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
2. Match color, texture, and appearance.
3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.07 PROGRESS CLEANING

3.07.A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

3.07.B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

3.07.C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

3.07.D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.08 PROTECTION OF INSTALLED WORK

3.08.A. Protect installed work from damage by construction operations.

3.08.B. Provide special protection where specified in individual specification sections.

3.08.C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

3.08.D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

3.08.E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

3.08.F. Protect work from spilled liquids. If work is exposed to spilled liquids, immediately remove protective coverings, dry out work, and replace protective coverings.

3.08.G. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

3.08.H. Prohibit traffic from landscaped areas.

3.08.I. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.08.J. Comply with manufacturer's written instructions for temperature and relative humidity.

3.09 SYSTEM STARTUP

3.09.A. Coordinate schedule for start-up of various equipment and systems.

3.09.B. Notify Architect and Owner seven days prior to start-up of each item.

3.09.C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

3.09.D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

3.09.E. Verify that wiring and support components for equipment are complete and tested.

3.09.F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

3.09.G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

3.09.H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.10 DEMONSTRATION AND INSTRUCTION

3.10.A. See Section 01 7900 - Demonstration and Training.

3.11 ADJUSTING

3.11.A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.11.B. Testing, adjusting, and balancing HVAC systems: See Section 23 0593 - Testing, Adjusting, and Balancing for HVAC.

3.12 FINAL CLEANING

3.12.A. Execute final cleaning prior to Substantial Completion.

3.12.B. Use cleaning materials that are nonhazardous. Use materials recommended by manufacturer or fabricator of the surface to be cleaned.

3.12.C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

3.12.D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

3.12.E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

3.12.F. Clean filters of operating equipment.

3.12.G. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, drainage systems, and _____.

3.12.H. Clean site; sweep paved areas, rake clean landscaped surfaces.

3.12.I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.13 CLOSEOUT PROCEDURES

3.13.A. Make submittals that are required by governing or other authorities.
1. Provide copies to Architect.

3.13.B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

3.13.C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

3.13.D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

3.13.E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

3.13.F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

3.13.G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

3.13.H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

END OF SECTION 01 7000

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SECTION 01 7800
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

1.01.A. Project record documents.

1.01.B. Operation and maintenance data.

1.01.C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

1.02.A. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

1.02.B. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.

1.02.C. Individual Product Sections: Specific requirements for operation and maintenance data.

1.02.D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

1.03.A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.

1.03.B. Operation and Maintenance Data:

1. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
2. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
3. Submit two sets of revised final documents in final form within 10 days after final inspection.

1.03.C. Warranties and Bonds:

1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.

3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

3.01.A. Maintain on site one set of the following record documents; record actual revisions to the Work:
1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed shop drawings, product data, and samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

3.01.B. Ensure entries are complete and accurate, enabling future reference by Owner.

3.01.C. Store record documents separate from documents used for construction.

3.01.D. Record information concurrent with construction progress.

3.01.E. 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.

3.01.F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
1. Measured depths of foundations in relation to finish first floor datum.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
4. Field changes of dimension and detail.
5. Details not on original Contract drawings.

3.01.G. Submit PDF electronic files of scanned record prints, specifications and product data, including addenda and contract modifications.

3.02 OPERATION AND MAINTENANCE DATA

3.02.A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

3.02.B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

3.02.C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

3.02.D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

3.03.A. For Each Product, Applied Material, and Finish:

1. Product data, with catalog number, size, composition, and color and texture designations.
2. Information for re-ordering custom manufactured products.

3.03.B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

3.03.C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

3.03.D. Additional information as specified in individual product specification sections.

3.03.E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

3.04.A. For Each Item of Equipment and Each System:

1. Description of unit or system, and component parts.
2. Identify function, normal operating characteristics, and limiting conditions.
3. Include performance curves, with engineering data and tests.
4. Complete nomenclature and model number of replaceable parts.

3.04.B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04.C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

3.04.D. Include color coded wiring diagrams as installed.

3.04.E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

3.04.F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

1. Include HVAC outdoor and exhaust air damper calibration strategy.
    a. Include provisions which ensure that full closure of dampers can be achieved.
2. Include Carbon Dioxide Monitoring Protocol.
3. Include Carbon Monoxide Monitoring Protocol.
4. Include Frost Mitigation Strategy for ventilation heat-recovery system.

3.04.G. Provide servicing and lubrication schedule, and list of lubricants required.

3.04.H. Include manufacturer's printed operation and maintenance instructions.

3.04.I. Include sequence of operation by controls manufacturer.

3.04.J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

3.04.K. Provide control diagrams by controls manufacturer as installed.

3.04.L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.

3.04.M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

3.04.N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

3.04.O. Include test and balancing reports.

3.04.P. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

3.05.A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

3.05.B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

3.05.C. Binders: Commercial quality, 8-1/2 by 11 inch (216 by 280 mm) three D side ring binders with durable plastic covers; 2 inch (50 mm) maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

3.05.D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

3.05.E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Construction Manager, Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

3.05.F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

3.05.G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

3.05.H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.

3.05.I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

3.05.J. Arrangement of Contents: Organize each volume in parts as follows:

1. Project Directory.
2. Table of Contents, of all volumes, and of this volume.
3. Operation and Maintenance Data: Arranged by system, then by product category.
    a. Source data.
    b. Operation and maintenance data.
    c. Field quality control data.
    d. Photocopies of warranties and bonds.

3.05.K. Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Bookmark individual documents base on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

3.06 WARRANTIES AND BONDS

3.06.A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

3.06.B. Verify that documents are in proper form, contain full information, and are notarized.

3.06.C. Co-execute submittals when required.

3.06.D. Retain warranties and bonds until time specified for submittal.

3.06.E. Manual: Bind in commercial quality 8-1/2 by 11 inch (216 by 279 mm) three D side ring binders with durable plastic covers.

3.06.F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

3.06.G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

3.06.H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

3.06.I. Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at the beginning of each document.

END OF SECTION 01 7800

SECTION 01 7900
DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

1.01.A. Demonstration of products and systems where indicated in specific specification sections.

1.02 RELATED REQUIREMENTS

1.02.A. Section 01 7800 - Closeout Submittals: Operation and maintenance manuals.

1.02.B. Other Specification Sections: Additional requirements for demonstration and training.

1.03 SUBMITTALS

1.03.A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.03.B. Training Plan: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.

1. Submit to Architect for transmittal to Owner.
2. Submit not less than four weeks prior to start of training.
3. Revise and resubmit until acceptable.
4. Provide an overall schedule showing all training sessions.
5. Include at least the following for each training session:
    a. Identification, date, time, and duration.
    b. Description of products and/or systems to be covered.
    c. Name of firm and person conducting training; include qualifications.
    d. Intended audience, such as job description.
    e. Objectives of training and suggested methods of ensuring adequate training.
    f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
    g. Media to be used, such as slides, hand-outs, etc.
    h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.

1.03.C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.

1. Include applicable portion of O&M manuals.
2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.

3. Provide one extra copy of each training manual to be included with operation and maintenance data.

1.03.D. Training Reports:
1. Identification of each training session, date, time, and duration.
2. Sign-in sheet showing names and job titles of attendees.
3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.

1.03.E. Video Recordings: Submit digital video recording of each demonstration and training session for Owner's subsequent use.
1. Format: DVD Disc.
2. Label each disc and container with session identification and date.

1.04 QUALITY ASSURANCE

1.04.A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 DEMONSTRATION - GENERAL

3.01.A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.

3.01.B. Demonstration may be combined with Owner personnel training if applicable.

3.01.C. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
1. Perform demonstrations not less than two weeks prior to Substantial Completion.
2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

3.01.D. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.02 TRAINING - GENERAL

3.02.A. Conduct training on-site unless otherwise indicated.

3.02.B. Owner will provide classroom and seating at no cost to Contractor.

3.02.C. Provide training in minimum two-hour segments.

3.02.D. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.

3.02.E. Review of Facility Policy on Operation and Maintenance Data: During training discuss:

1. The location of the O&M manuals and procedures for use and preservation; backup copies.
2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
3. Typical uses of the O&M manuals.

3.02.F. Product- and System-Specific Training:

1. Review the applicable O&M manuals.
2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
4. Provide hands-on training on all operational modes possible and preventive maintenance.
5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
6. Discuss common troubleshooting problems and solutions.
7. Discuss any peculiarities of equipment installation or operation.
8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
9. Review recommended tools and spare parts inventory suggestions of manufacturers.
10. Review spare parts and tools required to be furnished by Contractor.
11. Review spare parts suppliers and sources and procurement procedures.

3.02.G. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION 01 7900

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SECTION 310000 – EARTHWORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. Excavation for building slabs, walks and pavements.

B. Filling and backfilling to attain indicated grade elevations.

C. Rough and finish grading.

D. Topsoil removed and stock piled.

E. Granular backfill where indicated and specified.

F. Topsoil spreading and Finishing.

1.2 REFERENCES

A. City of Dayton Construction and Material Specifications, (CMSD).

B. State of Ohio Department of Transportation Construction and Material Specifications (ODOT), Latest Edition (2023), online version 01/09/2024

1.3 RELATED SECTIONS

A. Section 31 10 00: Site Clearing.

B. Section 31 22 19: Finish Grading.

C. Section 31 23 33: Trenching, Backfilling and Compacting.

1.4 DEFINITIONS

A. Excavation: Consists of removal of materials encountered to subgrade elevations indicated and subsequent disposal of materials removed.

B. Subgrade: The compacted soil fill or undisturbed earth immediately below the footings, slabs or pavement systems.

C. Sub base: The compacted granular fill layer used in pavement systems or buildings between the sub grade and the pavement base course material or building slab and foundation.

D. Engineered Fill: This is a special fill placed under proposed pavement, building or other location in 6" lifts. Each lift compacted to ASTM698, 100% density under supervision of the Soil Engineer.

1.5 QUALITY ASSURANCE

A. Perform work in compliance with applicable requirements of government authorities.

B. Contractor shall retain and pay for an independent soil testing and inspection service during earth work operation. Rate of testing and inspection shall be as specified in Section 3.8 of the specification.

1.6 SUBMITTALS

A. Submit the following for approval:
1. Fill material imported
2. Sub grade compaction report
3. Foundation bearing condition report
4. All compaction reports

1.7 JOB CONDITIONS

A. Data indicated of subsurface conditions in the soil report are not intended as representations or warranties of accuracy or continuity between soil borings. It is expressly understood that Owner will not be responsible for interpretations or conclusions drawn there from by Contractor. Data is made available for convenience of Contractor. However, note that the recommendations of earthwork given in the soil report are part of the contract documents. Contractor should verify job condition prior to bidding. This includes requirements of phasing, sequencing and protection of existing items to remain.

B. Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.

C. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of the utility owner.

D. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, during occupied hours, except when permitted in writing by the Architect of Record and then only after acceptable temporary utility services have been provided.

E. Provide minimum of 48-hour notice to the Architect of Record and receive written notice to proceed before interrupting any utility.

F. Barricade open excavations occurring as part of this work and post with warning lights.

G. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earth work operations.

H. Conform to the sedimentation and erosion control requirements of the project and regulations of the authorities having jurisdiction.

I. Conform to Section 31 25 00 Erosion and Sedimentation Control.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All backfill, fill, sub-base material and granular fill is subject to approval by the Architect of Record. Placement of these fill materials prior to approval is not acceptable and will result in unsuitable material being removed and replaced with approved fill at Contractor's expense.

B. Suitable fill material not available at the site shall be imported from off-site subject to approval by the Architect of Record.

C. Backfill and fill: Native soil materials free of clay, rock or gravel larger than 2" in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter.

D. Sub-base Material: Bank run sand and gravel less than 15% passing the 200 sieve.

E. Granular fill and base: Conform to CMSD Item 703.04.

F. Remove topsoil from the construction area and stockpile topsoil separately from other earth. Conform to CMSD Item 651.

G. Topsoil: If quantity of stockpiled topsoil is insufficient, provide additional topsoil as required. New topsoil shall be fertile, friable, natural loam, surface soil, reasonably free of subsoil, clay lumps, brush, weeds and other litter and free of roots, stumps, stones larger than 1/2" in any dimensions, and other extraneous or toxic matter harmful to plant growth.

H. Filter Fabric shall conform to CMSD Item 712.09

I. Control Density Fill Material, CDF - where indicated shall be Low Strength Mortar Backfill conforming to CMSD Item 615.

J. Engineered Fill Material shall be site obtained soil or impaired soil weighing not less than 105 PCF at optimum moisture content - or as approved by the soil engineer - placed in 8" lifts - each lift compacted to 100% standard proctor.

PART 3 - EXECUTION

3.1 GENERAL

A. Excavate for structures to elevations and grades shown. Extend excavation a sufficient distance from foundations to permit placing and removal of formwork, installation of materials, services and inspection.

B. Excavate for sidewalks and paving to cross-sections, elevations and grades shown. Allow for base material.

C. Hand trim footing and foundation excavations and leave free from loose organic matter.

D. When complete, verify soil bearing capacities, depths and dimensions.

E. Additional excavation shall be required when unsatisfactory soil materials extending below required sub grade elevations are discovered. All additional excavation shall be authorized, in writing, prior to performance of the work. Removal of unsuitable material and its replacement will be paid on basis of contract conditions relative to changes in work.

F. Unauthorized excavation consists of removal of materials beyond indicated sub grade elevations without specific direction of the Architect of Record. Unauthorized excavation as well as remedial work directed by the Architect of Record shall be at Contractor's expense.

G. Under footings, foundation bases, or retaining walls fill unauthorized excavation by extending indicated bottom elevation of footing base to excavation bottom, without altering required top elevation.

H. Shore and brace excavations, as necessary, to prevent accidents or damage from caving or erosion. Remove shoring carefully to prevent caving or collapse of excavated faces.

I. Maintain excavations free of water. Provide ample means and equipment to promptly remove and dispose of all water from every source entering excavations. Absorption of heavy rainfall accumulation of water and heavy construction traffic may result in softening of the soil; hence, severely weakening sub grade soils shear strength.

J. Provide Filter Fabric where indicated. Conform to CMSD Item 712.09.

3.2 BACKFILLING AND FILLING

A. Ensure areas to be backfilled are free from debris, snow, ice and water and that ground surfaces are not in a frozen condition.

B. Do not backfill over existing sub grade which are porous, wet or spongy.

C. Compact existing sub grade surfaces if densities are not equal to that required for backfill materials.

D. Cut out soft areas of existing sub grade. Backfill with fill material and compact to required density.

E. Spread approved fill material in layers not greater than 8" of un-compacted thickness. Do not use muddy or frozen fill materials.

F. Moisture-condition fill material, as required, by aerating or watering and thoroughly mixes material to obtain moisture content permitting proper compaction.

G. Compact each layer of fill material to at least the specified density requirement, repeat until plan grade elevation is attained.

H. Use hand tampers or vibrating compactors at foundation walls and similar locations inaccessible to large equipment and rollers. Do not use rolling equipment adjacent to foundations.

I. Do not backfill against building structures until walls or bearing surfaces have reached design strength or are properly braced and backfilling operations are approved.

3.3 FILL TYPES

A. In building excavations: Existing foundation and basement areas: engineered fill or granular fill as indicated.

B. Backfill basement and foundation walls: Granular fill and compacted subgrade.

C. Under grassed and landscaped areas: Backfill and fill material.

D. Under walks and pavements: Granular base on compacted subgrade or engineered fill.

E. Granular backfill under all paved areas.

F. CDF - where indicated.

3.4 COMPACTION

A. Provide compaction control for all fill and backfill, both inside and outside perimeter of the structures. Perform field compaction tests and related laboratory analyses. Soil proposed for fill and backfill shall be analyzed by the Architect of Record. A representative of the testing laboratory shall provide continuous inspection during placement and compaction operations; tests shall be made in a quantity that will assure uniform compaction and density of each course, or lift of fill. The inspection and testing shall comply with the specifications set forth in Division 1. See Section 3.8 of the specification.

B. Compact top 12" sub grade and each layer of fill or backfill material at foundations, within paved areas to a density of 98% of optimum, Standard Proctor dry density. The moisture in the cohesive site soils should be controlled within +/- 3% of the optimum Standard Proctor Moisture Content. Compact within the building area to 100% of optimum density.

C. Compact top 6" of sub grade and each layer of fill or backfill material at lawns and unpaved areas to a density of 90% at optimum moisture content in accordance with ASTM D698, Standard Proctor Method.

D. Puddling or jetting of fill and backfill material as a compaction method is not permitted.

3.5 GRADING

A. Uniformly grade the site. Distribute stockpiled topsoil. Provide uniform levels and slopes. Grade areas to drain away from structures and prevent ponding. Provide surfaces free from irregular surface changes and as follows:

1. Lawn areas: Provide 6" of topsoil at lawn areas. Finish grade to required finish grade elevations.
2. Paving areas: Shape surface of areas to line, grade and cross-section, with finish surface not more than ½" above or below the required sub grade elevation.
3. Granular base: Grade surface smooth and even, free of voids and to within a tolerance of ½" of the required elevation.

3.6 MAINTENANCE

A. Protect graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded ad damaged areas.

B. Where completed areas are disturbed by construction operations or adverse weather, scarify surface, reshape and compact to required density.

C. Where settling is measurable or observable at excavation areas during general project warranty period, remove surface, add backfill material as specified, compact and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work.

3.7 EXCESS AND WASTE MATERIALS

A. Remove waste materials, including rock, trash and debris from the site and legally dispose of it.

B. Maintain disposal route clear, clean and free of debris.

C. Remove excess excavated materials, including excess topsoil, from the site. Spread and grade as directed.

3.8 TESTING

A. Quality control testing during construction: Allow testing service to inspect and approve sub grades and fill layers before further construction work is performed.

B. If during progress of work, tests indicate that compacted materials do not meet specified requirements, remove defective work, replace and retest at no cost to the Owner.

C. Paved Areas and Building Slab Sub grade: Make at least one field density test of sub grade for every 2,000 square feet of paved area or building slab, but in no case less than 3 tests. In each compacted fill layers, make one field density test for every 2,000 square feet of overlaying building slab or paved area, but in no case less that 3 tests.

END OF SECTION 31 00 00

SECTION 31 10 00- SITE CLEARING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Remove surface debris.
B. Remove paving, curbs, walls, retaining walls, steps, and miscellaneous other structures indicated on the drawings and as required for the construction of the project as detailed.
C. Clear site of plant life and grass.
D. Grub the site.
E. Remove trees and shrubs within the work area.
F. Remove root systems of trees and shrubs.
G. Abandon/remove utilities.

1.02 REFERENCES

A. State of Ohio Department of Transportation Construction and Material Specifications (ODOT), Latest Edition (2016)

1.03 RELATED SECTIONS

A. Section 31 00 00: Earthwork.
B. Section 31 05 00: Erosion and Sedimentation Control

1.04 REGULATORY REQUIREMENTS

A. Conform to applicable local codes for disposal of debris.C
B. Coordinate clearing work with utility authorities.

1.05 ENVIRONMENTAL CONDITIONS

A. Conduct clearing to minimize interference with adjacent structures.
B. Provide, erect, and maintain temporary barriers and security devices.Conduct operations with minimum interference to public or private thoroughfares. Maintain protected egress and access at all times.
C. Do not close or obstruct roadways or sidewalks without permits.

PART 2 – PRODUCTS

A. Not Used

PART 3 – EXECUTION

3.01 PREPARATION

A. Verify that existing plant life and features designated to remain are tagged and identified.

3.02 PROTECTION

A. Protect utilities and all other site features that remain, from damage.
B. Protect trees, plant growth, and features designated to remain as final landscaping.
C. Protect bench marks and survey monuments from damage or displacement.

3.03 CLEARING

A. Clear areas required for access to site and execution of work.
B. Remove paving and curbs. Saw cut pavement or carefully remove at nearest joint.
C. Remove boundary walls, retaining walls, steps, debris, drainage gutters, and all other items interfering with construction within the limits shown on the drawings.
D. Remove trees and shrubs complete within the limits shown on the drawings including stumps and all roots.
E. Grub all areas within limits of construction, including areas under new fill, to a depth of 2 inches, removing all sod.
F. Conform to all applicable requirements of ODOT Item 201.

3.04 REMOVAL

A. Entire site shall be cleared of all debris such as dumped excavated materials, stones, broken concrete, asphalt, lumber, trash, etc.
B. All materials removed during clearing and grubbing operations shall be immediately removed from the site and disposed of legally. OARDC does not permit excavated

materials to be removed from its campus. A designated stockpile area for these materials is located within one mile of the project site.

C. Burning or burying of materials on the site will not be permitted.

END OF SECTION 31 10 00

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SECTION 312219 - FINISH GRADING

PART 1 – GENERAL

1.1 DESCRIPTION

A. This work shall consist of placing and leveling topsoil materials to the grades and lines specified on the plans.

1.2 REFERENCES

A. City of Dayton Construction and Material Specifications (CMSD)
B. State of Ohio Department of Transportation Construction and Material Specifications (ODOT), Latest Edition (2023), online version 01/09/2024

1.3 RELATED SECTIONS

A. Section 31 00 00: Earthwork.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

3.1 INSPECTION

A. Verify site conditions and note irregularities affecting work of this Section.

B. Beginning work of this Section means acceptance of existing conditions.

3.2 SUBSOIL PREPARATION

A. Remove debris, roots, branches, stones in excess of ½ inch in size.

B. Remove subsoil contaminated with petroleum products.

C. Scarify sub grade to depth of 3 inches where topsoil is scheduled. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

3.3 PLACING TOPSOIL

A. Place topsoil in areas where seeding is scheduled to a depth of 6 inches and 6 inches in areas shown as plans as planting beds.

B. Use topsoil in relatively dry state. Place during dry weather.

C. Fine grade topsoil eliminating rough areas. Maintain levels, profiles, and contours specified on the plans.

D. Remove stone, roots, grass, weeds, debris and foreign materials in excess of 1 ½ inches in size while spreading.

E. Lightly compact placed topsoil.

F. Remove surplus subsoil and topsoil from site.

G. Leave stockpile area and site clean and raked, ready to receive landscaping.

3.4 TOLERANCES

A. Top of topsoil; plus or minus ½ inch.

END OF SECTION 312219

SECTION 312333 - TRENCHING BACKFILLING AND COMPACTING

PART 1 – GENERAL

1.1 DESCRIPTION

A. This work shall consist of excavating the trench, backfilling the trench after pipe installation, and compaction of designated areas. The work shall be performed by contractors normally engaged in excavation, having the experienced personnel to perform work of the type required by the Contract Documents for this project, and licensed where appropriate.

B. Provide all labor, equipment and material to complete the construction proposed on the drawings and as specified.

1.2 REFERENCES

A. City of Dayton Construction and Material Specifications (CMSD)

B. State of Ohio Department of Transportation Construction and Material Specifications (ODOT), Latest Edition (2023), online version 01/09/2024

1.3 RELATED SECTIONS

A. Section 31 00 00: Earthwork.

1.4 SUBSURFACE DATA

A. Subsurface soil investigations have been made at the site. The complete report of information obtained may be examined in the offices of the Architect of record.

B. Bidders and Contractors are expected to examine the site and review the soil report, determine the character of materials to be encountered and requirements of construction of the project prior to bidding. No additional borings are required during bidding.

1.5 PREPARATION AND PROTECTIONS

A. Protect and maintain benchmarks, monuments, batter boards, or other reference points from displacement or damage. Immediately replace or repair reference points damaged, destroyed or displaced to condition approved by Architect of Record.

B. Verify locations of active utility lines and sewers, including manholes, within and adjacent to project site. Use caution in all earthwork operations in these areas to avoid displacement or damage to such items. Support and protect such lines with suitable measures as required including use of temporary sheet piling, shoring, etc., as necessary.

C. Shore and brace ground areas and cut-slopes adjacent to excavated areas as necessary to maintain stability of the unexcavated areas and to prevent cave-ins. Do not remove temporary protection until adequate permanent support is provided.

D. Protect bottom of excavations from frost and surface drainage. If freezing occurs, remove frozen soil and replace with approved compacted fill or backfill material (granular material or lean concrete) as approved by the Architect of Record for the conditions.

E. Keep the excavations free from water. Use pumps as necessary. Conduct removed water to approved collecting or runoff areas outside the limits of all proposed excavation.

F. Protect newly backfilled areas as necessary from actions of the weather elements. Any settlement or washing that occurs shall be repaired and grades reestablished by Contractor at no additional cost to the University.

1.6 DRAINAGE MAINTENANCE

A. During entire course of earthwork operations and other work, the Contractor is responsible for and required to maintain in functional condition all existing drainage ways, including into, around and from the project areas.

B. In addition, provide any temporary measures necessary to assure proper drainage on the project site area and maintain function.

1.7 DISPOSAL OF WASTE AND EXCESS MATERIALS

A. Remove from site and legally dispose of all materials encountered that are unsuitable for incorporation into project work, and spread all excess materials from earthwork operations evenly east of the proposed building.

B. No burying or burning of waste materials is permitted on site.

PART 2 – PRODUCTS

2.1 PRODUCTS

A. Bedding: #57 stone conforming to ODOT Item 703.
B. Bedding: #8 stone conforming to ODOT Item 703.

PART 3 – EXECUTION

3.1 TRENCHING

A. Safety:

1. For the security or safety of persons in and adjacent to trenches or construction operations, the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America as well as the pertinent specifications of the Occupational Safety and Health Act, with all current amendments shall be followed when specifically applicable, or by similarity of operation or as necessary for adequate protection.

3.2 PROTECTION OF TREES

A. Special care shall be taken to avoid damages to trees and their root systems. Machine excavation shall not be used when it would endanger tree roots. In general, where the line of trench falls within the limits of the limb spread, the leaving of headers across the trench to protect roots will be required. The operation of all equipment, particularly when employing booms, the storage or materials, and the deposition of excavation, shall be conducted in the manner which will not injure trees, trunks, branches or their roots unless such trees are designated by the Architect of Record for removal.

B. Site construction fence required around existing oak tree to remain as indicated.

3.3 TRENCH EXCAVATION (Earth)

A. The trenches in which the pipes and appurtenances are to be constructed shall be excavated in all cases in such a manner and to such widths as will accommodate the

building of the structures they are to contain. In no case shall the trench width at the top of the pipe exceed the outside diameter of the pipe plus eighteen (18) inches for pipe up to 24 inches I.D.; plus thirty-six (36) inches for pipe from 27 inches to 72 inches I.D.; plus forty-eight (48) inches for pipe greater than 79 inches I.D... Machine excavation shall be stopped at the depths outlined under "Bottom Preparation" for the type of pipe being installed. Unauthorized excavation below grade shall be filled with granular material, at the expense of the Contractor.

B. Width of trenches shall be held to a minimum to accommodate the pipe, timbering, etc., and in no event will the trench width at the top of the pipe diameters be less than specified in the Trench Excavation (Earth) Section 4, unless prior approval has been received from the Architect of Record.

C. If for any reason, excessive trench width occurs at depth which would impose critical loads on the pipe, the Contractor shall provide gravel or stone backup, extra strength pipe or concrete encasement as approved by the Architect of Record at no additional cost to the Owner.

D. Where the pipe is located adjacent to, or in pavement, the Contractor shall be required to maintain vertical sides on all trenches using full sheeting and bracing if necessary. Maximum top width or trench permitted under such conditions shall be four (4) feet, plus the inside diameter of the pipe.

3.4 BOTTOM PREPARATION

A. The trench shall be machine excavated to a point not less than six (6) inches below the barrel of the pipe. All loose earth shall be removed from the trench bottom and a bed prepared and compacted using bedding material according to the Section titled "Bedding and Haunching."

3.5 FOUNDATION

A. The sewers or other utility mains are to be built on good foundation. Such measures as necessary and as approved by the Architect of Record shall be used to prevent settlement. If, in the Architect of Record's opinion, the material forming the bottom at the grade of the sewer or pressure main is not suitable for foundation, a further depth shall be excavated and the same filled with granular material and compacted. Contact price shall be adjusted accordingly for additional excavation and backfill.

3.6 DRAINAGE

A. Should water be encountered, the Contractor shall furnish and operate a suitable pumping plant with a capacity adequate to de-water the trench, dispose of such water, and to maintain drainage conditions, as approved by the Architect of Record. During laying and joint making operations, the water level in the working area shall be maintained at an elevation of at least two (2) inches below the bottom of the bell of the pipe until, in the opinion of the Architect of Record, water damage to completed joints will not occur.

3.7 TIMBERING

A. Unsupported open cut for sewers will not be permitted to occur where in violation of the Occupational Safety and Health Act of 1970, and its revisions, or where soil conditions necessitate unusually wide trenches causing damage to street pavement, trees, structures, poles, or other private or public property. During the progress of the work, whenever and wherever it is necessary either to provide safe working conditions or to avoid the danger of damage to existing structures or structures being built, the Contractor shall, at his expense, support the sides of the excavation by adequate and suitable sheeting, shoring and bracing. Such trench support material and equipment shall remain in place until backfilling operations have progressed to the point where the supports may be withdrawn without endangering structures.

3.8 TRIMMING

A. All material excavated in trenching and all materials used in construction of the work shall be deposited so as not to endanger the work or create unnecessary annoyance to the public. During the progress of the work, all material piles shall be kept trimmed and maintained in a neat, workmanlike manner.

3.9 BEDDING AND HAUNCHING

A. Pipe Bedding Materials per CMSD Item 810.02

B. To assure adequate and uniform support of the pipe, a bedding layer 6” min. or O.D./8 (whichever is larger) in depth shall be provided. Required Bedding Classes for different pipe materials are listed in the following table:

C. The same material used for bedding shall be used for haunching to the spring line of the pipe (horizontal center line). Class I material requires slight compacting. Precautions shall be taken to prevent movement of the pipe during placement of the haunching.

3.10 INITIAL BACKFILL

A. The same material used for bedding and haunching shall be placed to a minimum depth of six (6) inches over the pipe. This shall be increased to twelve (12) inches over the pipe if remaining backfill material contains large or heavy particles that may damage the pipe.

3.11 TRENCH BACKFILLING

A. Description

1. All trenches and excavations shall be backfilled immediately after pipe is laid and/or tested. No material shall be used for backfilling that contains stones, having a dimension greater than three (3) inches, frozen earth, debris, or earth with an exceptionally high void content.
2. For backfill above the horizontal centerline and to a level of 6" to 12" over the top of the pipe, bedding materials shall be used, and placed as previously described. Each layer shall be placed, then carefully and uniformly tamped, so as to eliminate the possibility of pipe settlement, misalignment and damage to joints. In lieu of the above described method the Contractor may, at his own expense, use shovel tamped granular material to backfill over the pipe. The Contractor shall place bulkheads of native clay soil across the trench at 100 foot intervals to resist the movement of groundwater through the granular material. Such bulkheads shall be carefully compacted and shall extend approximately three feet in a direction parallel to the pipe and shall extend from the bottom of the trench to a height of 12 inches above the top of the pipe.
3. Above the tamped backfill, the Contractor may complete the backfilling with mechanical equipment. This shall be done in such a manner that the material does not free-fall onto the hand-placed cover. The backfill shall be so placed that it will "flow" onto the hand-placed cover from the section partially filled. The Contractor shall consolidate the backfill in such a manner as will insure the minimum possible settlement at the least interference with traffic. Where sewers are located in or adjacent to pavements, all backfilling and materials handling equipment shall have rubber tires. Through rights-of-ways, not adjacent to pavement areas, "crawler" type backfill equipment will be permitted. Granular material shall be used for backfill of

trenches in pavements and driveways and at other places where indicated. The granular backfill shall be as specified under Section 3.14 "Granular Backfill." Periodical dressing of fill over the trench to improve drainage and safety conditions shall be made during the course of the contract.

B. Noise, Dust and Odor Control

1. The Contractor's performance of this contract shall be conducted so as to eliminate all unnecessary noise, dust and odors.

C. Cleaning Up

1. Immediately after a section of pipe is tested and accepted for payment, the ground surfaces shall be cleaned of all surplus material including stones, broken pipe, construction material, and all other debris by the Contractor, to the satisfaction of the Architect of Record.
2. The Contractor shall be responsible for the condition of the trenches for a period of one year from the date of the contract completion.

D. Minimum cover backfill requirements:

Paved within ROW	48 inches or Less	Concrete Encasement
	Greater than 48 inches	Structural Backfill per CMSD Item 813
Paved	30 inches or Less	Concrete Encasement
	Greater than 30 inches	Structural Backfill per CMSD Item 813
Unpaved	24 inch or 1 pipe diameter Minimum (the greater)	Compacted Backfill per CMSD Item 810
*Note 1: Cover equals the distance from top of pipe to proposed grade or top of pavement elevation.		

3.12 GRANULAR BACKFILL

A. Description

1. Where specified by the Architect of Record, the excavation shall be backfilled with granular material so placed and compacted as to prevent further settlement.
2. Granular material shall be as indicated in Section 31 00 00 - Earthwork

3. Granular material shall be placed in layers of approximately six (6) inches in thickness and compacted with mechanical tampers. It may be compacted with water if satisfactory drainage is provided for the free water.

3.13 RESTORATION OF EXISTING SURFACES

A. Lawns

1. The area shall be covered with at least four (6) inches of topsoil (stripped and saved from the trench excavation or borrow) and brought level with surrounding ground.
2. The area shall be hand raked and shall be free of rock and foreign material greater than one (1) inch in any dimension.

B. Field areas

1. Upon completion of construction, soil shall be mounded over any pipeline trench to a height of 18 inches above existing ground elevation. After sufficient rainfall has occurred to insure 90% settlement, the area shall be brought to level grade by removing, or adding additional earth, as conditions warrant.

3.14 PAVEMENT REPLACEMENT OVER TRENCHES

A. All existing pavement surfaces, other than those for which resurfacing has been provided, shall be restored to their condition at the time the project was begun, by filling all gouges or other damages with the equivalent material for asphalt surfaces, and a vinyl, or epoxy concrete approved by the Architect of Record for existing Portland Cement Pavement.

3.15 EROSION AND SEDIMENT CONTROL MEASURES

A. The Contractor shall prevent and control all problems associated with erosion and sediment runoff processes which occur during and after project construction. The Contractor shall comply with all applicable federal, state and local laws, and particularly the Environmental Protection Agency Nonpoint Source Pollution Control Guidance.

B. Site construction shall consider potential occurrence of erosion and sediment losses. Study of the site conditions should include soil and geologic limitations, topography, vegetation, wildlife habitats, proximity to surface water, and climate.

C. The construction layout, sequencing and scheduling shall be designed to fit the local topography and soil conditions.

D. Whenever feasible, land grading and excavating shall be kept at a minimum to reduce the possibility of creating runoff and erosion problems that require extensive control measures.

E. Topsoil shall be removed and stockpiled before grading begins.

F. Land exposure shall be minimized in terms of area and time.

G. Exposed areas, subject to erosion, shall be covered as quickly as possible by means of mulching or vegetation.

H. Natural vegetation shall be retained whenever feasible.

I. Appropriate structural or agronomic practices to control runoff and sedimentation shall be provided during and after construction.

3.16 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Division 1.

B. Tests and analysis of fill material will be performed in accordance with ANSI/ASTM D698 and Division 1.

C. Compaction testing will be performed in accordance with ASTM D2922 and ASTM D3017 and with Division 1.

D. If tests indicate Work does not meet specified requirements, remove work, replace, and retest at no cost to Owner.

E. Frequency of Tests: Every two lifts.

END OF SECTION 312333

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SECTION 321100 – BASE COURSES

PART 1 - **GENERAL**

1.1 Description

A. This work shall consist of furnishing, placing and compacting one or more courses of aggregate, including furnishing and incorporating all water required for compacting, on a prepared surface in accordance with these specifications, in reasonably close conformity with the lines, grades, thickness and typical cross sections shown on the plans.

B. This work shall consist of inspecting and testing previously placed and compacted aggregate by others in accordance with these specifications, and regrading, furnishing, placing and compacting one or more courses of aggregate, including furnishing and incorporating all water required for compacting, on previously placed and compacted aggregate by others in accordance with these specifications, in reasonably close conformity with the lines, grades, thickness and typical cross sections shown on the plans.

1.2 References

A. City of Dayton Construction and Material Specifications (CMSD)

B. Ohio Department of Transportation Construction and Material Specifications (ODOT), Latest Edition (2023), online version 01/19/2024.

C. State of Ohio Department of Transportation Construction Administration Manual of Procedures

D. State of Ohio Department of Transportation Supplement 1015 Compaction Testing of Unbound Materials.

1.3 Related sections

A. Section 31 00 00: Earthwork

B. Section 32 12 16: Asphaltic Paving

PART 2 - **PRODUCTS**

2.1 AGGREGAE BASE

A. The aggregate base shall be ODOT Item 304 as a minimum. Additionally, conform to the following:

1. The aggregate shall be crushed carbonate stone, crushed gravel, crushed air-cooled slag, slags or slacker aggregate. Crushed carbonate stone, crushed gravel, crushed

air-cooled slag or mixtures of crushed and granulated slags shall meet the following gradation requirements as well as 50 percent wear maximum, by the Los Angeles Test (stone or gravel); 25 percent maximum loss, sodium sulfate soundness test; and no more than 90% maximum of fractured pieces. Shale shall not exceed 5 percent.

2.

Sieve Size	Total Percent Passing
2 inch	100
1 inch	70-100
¾ Inch	50-90
No.4	30-60
No.40	7-30
No.200	0-13

B. Aggregate acceptance shall be determined prior to incorporation into the work based on sample taken from stockpiles.

C. Prior to placing, aggregate shall have reasonably uniform moisture content at or near optimum for compaction.

D. Stone greater than 2 1/2 inches shall be excluded from the course.

PART 3 - **EXECUTION**

3.1 AGGREGATE

A. As a minimum conform to ODOT item 304. Additionally, conform to the following:
   1. Placing
      a. When vibratory equipment is used in conjunction with other methods of compaction, the depth of a single layer shall not exceed 6". When vibratory compaction equipment is not used, the maximum compacted thickness of one layer shall not exceed 3 inches. When the required compacted depth of the base course exceeds 6 inches, the base shall be constructed in two or more layers of approximately equal thickness.
         1) The aggregate shall be placed with self-propelled spreading machines capable of placing the aggregate true to line and grade. Approved hand placing methods may be used when the total area of base course is 2,000 square yards or less, or in small areas where machine spreading is impractical.
         2) Unless the base course is placed in a trench section, the edges shall be backed up with an 18-inch width of soil, placed to such a height that it will be consolidated to the height of the lift being compacted and furnish positive lateral support during compaction.
         3) Adequate surface drainage of the berm shall be provided at all time.
   2. Compaction

a. At the beginning of the compaction operation, the density requirement shall be determined by compacting a short section, until no further increase in density is obtained. The remainder of the course shall be compacted to a density not less that 98 percent of the test density. A new density requirement may be determined when the aggregate characteristics change appreciably. The surface of each layer shall be maintained during the compaction operations in such a manner that a uniform texture is produced and the aggregates firmly keyed. Water shall be uniformly applied over the base materials during compaction in the amount necessary to maintain the moisture at or near optimum.

b. The Contractor shall perform all compaction tests according to ODOT Supplement 1015. At a minimum, compaction testing shall be performed every 2,000 sf.

c. The finished surface shall not vary more than 3/8 inch from a 10-foot straightedge parallel to the centerline nor more than ½ inch from a template conforming to the required cross section. The Contractor shall furnish straight edges, templates or other devices and check the surface for conformance with these requirements.

d.

3. WIDTH

1) Width of the base course shall be greater than or equal to the width of pavement surface, if continues lateral support is provided during rolling, and shall extend two (2) times (x) base thickness beyond the edge of the course above, if not laterally supported.

END OF SECTION 32 11 00

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SECTION 32 12 16 - ASPHALT 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.

B. City of Dayton Construction and Material Specifications (CMSD) (latest edition)

1.2 SUMMARY

A. Section Includes:
   1. Cold milling of existing asphalt pavement.
   2. Asphalt patching.
   3. Asphalt paving.
   4. Asphalt overlay.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review methods and procedures related to asphalt paving including, but not limited to, the following:
      a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture asphalt.
      b. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include technical data and tested physical and performance properties.
   2. Job-Mix Designs: Documentation, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
   3. Job-Mix Designs: For each job mix proposed for the Work.

B. Samples for Verification: For the following product, in manufacturer's standard sizes unless otherwise indicated:
   1. Paving Fabric: 12 by 12 inches (300 by 300 mm) minimum.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and testing agency.

B. Material Certificates: Per City of Dayton Construction and Material Specifications herein referred to as CMSD (latest edition).

C. Material Test Reports: For each paving material, by a qualified testing agency.

D. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by the City of Dayton.

B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

C. Regulatory Requirements: Comply with materials, per CMSD section 401 except as otherwise directed in this document.
   1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
   1. Prime Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
   2. Tack Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
   3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
   4. Asphalt Base Course: Minimum surface temperature of 40 deg F (4.4 deg C) and rising at time of placement.
   5. Asphalt Surface Course: Minimum surface temperature of 60 deg F (15.6 deg C) at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: ASTM D 692/D 692M, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.

C. Fine Aggregate: ASTM D 1073 or AASHTO M 29, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.

D. For asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

E. Mineral Filler: ASTM D 242/D 242M or AASHTO M 17, rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

A. Asphalt Binder: AASHTO M 320, PG 64-22.

B. Asphalt Cement: ASTM D 3381/D 3381M for viscosity-graded material, ASTM D 946/D 946M for penetration-graded material. Cutback Prime Coat: ASTM D 2027, medium-curing cutback asphalt, MC-30 or MC-70.

C. Emulsified Asphalt Prime Coat: ASTM D 977 or AASHTO M 140 emulsified asphalt, or ASTM D 2397 or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

D. Tack Coat: ASTM D 977 emulsified asphalt, or ASTM D 2397 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application. Fog Seal: ASTM D 977 emulsified asphalt, or ASTM D 2397 cationic emulsified asphalt, slow setting, factory diluted in water, of suitable grade and consistency for application.

E. Water: Potable.

F. Undersealing Asphalt: ASTM D 3141/D 3141M; pumping consistency.

2.3 AUXILIARY MATERIALS

A. Recycled Materials for Asphalt Mixes: Per CMSD

B. Herbicide: Commercial chemical for weed control, registered by the EPA, and not classified as "restricted use" for locations and conditions of application. Provide in granular, liquid, or wettable powder form.

C. Sand: ASTM D 1073 or AASHTO M 29, Grade No. 2 or No. 3.

D. Paving Geotextile: AASHTO M 288 paving fabric; nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.

E. Joint Sealant: ASTM D 6690 or AASHTO M 324, Type I, Type II or III [Type IV], hot-applied, single-component, polymer-modified bituminous sealant.

2.4 MIXES

A. Asphalt: Dense-graded, asphalt plant mixes; designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Types"; and complying with the following requirements:
   1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.

B. Emulsified-Asphalt Slurry: ASTM D 3910, Type 1.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
   1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph (5 km/h).
   2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
   3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 COLD MILLING

A. Clean existing pavement surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement by cold milling to grades and cross sections indicated.
   1. Mill to a depth of 1-1/2 inches.
   2. Mill to a uniform finished surface free of excessive gouges, grooves, and ridges.
   3. Control rate of milling to prevent tearing of existing asphalt course.
   4. Repair or replace curbs, manholes, and other construction damaged during cold milling.
   5. Excavate and trim unbound-aggregate base course, if encountered, and keep material separate from milled hot-mix asphalt.
   6. Patch surface depressions deeper than 1 inch (25 mm) after milling, before wearing course is laid.
   7. Handle milled asphalt material according to approved waste management plan required in Section 017419 "Construction Waste Management and Disposal."
   8. Keep milled pavement surface free of loose material and dust.
   9. Do not allow milled materials to accumulate on-site.

3.3 PATCHING

A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches (300 mm) into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.

1. Pump hot undersealing asphalt under rocking slab until slab is stabilized or, if necessary, crack slab into pieces and roll to reseat pieces firmly.
2. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Recompact existing unbound-aggregate base course to form new subgrade.

C. Tack Coat: Before placing patch material, apply tack coat uniformly to vertical asphalt surfaces abutting the patch. Apply at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).

D. Allow tack coat to cure undisturbed before applying asphalt paving.

E. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

F. Placing Patch Material: Fill excavated pavement areas with asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

G. Placing Patch Material: Partially fill excavated pavements with asphalt base mix and, while still hot, compact. Cover asphalt base course with compacted, surface layer finished flush with adjacent surfaces.

3.4 REPAIRS

A. Leveling Course: Install and compact leveling course consisting of asphalt surface course to level sags and fill depressions deeper than 1 inch (25 mm) in existing pavements.
1. Install leveling wedges in compacted lifts not exceeding 3 inches (75 mm) thick.

B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch.
1. Clean cracks and joints in existing asphalt pavement.
2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch (6 mm) wide. Fill flush with surface of existing pavement and remove excess.
3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch (6 mm) wide. Fill flush with surface of existing pavement and remove excess.

3.5 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.
1. Mix herbicide with prime coat if formulated by manufacturer for that purpose.

C. Cutback Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd. (0.7 to 2.3 L/sq. m). Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

D. Emulsified Asphalt Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.10 to 0.30 gal./sq. yd. per inch depth (0.5 to 1.40 L/sq. m per 25 mm depth). Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure.
1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

E. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).
1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.6 PAVING GEOTEXTILE INSTALLATION

A. Apply tack coat uniformly to existing pavement surfaces at a rate of 0.20 to 0.30 gal./sq. yd. (0.8 to 1.2 L/sq. m).

B. Place paving geotextile promptly according to manufacturer's written instructions. Broom or roll geotextile smooth and free of wrinkles and folds. Overlap longitudinal joints 4 inches (100 mm) and transverse joints 6 inches (150 mm).

C. Protect paving geotextile from traffic and other damage, and place hot-mix asphalt overlay the same day.

3.7 PLACING ASPHALT

A. Machine place asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
1. Place asphalt base course in number of lifts and thicknesses indicated.
2. Place asphalt surface course in single lift.
3. Spread mix at a minimum temperature of 250 deg F (121 deg C).
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet (3 m) wide unless infill edge strips of a lesser width are required.
   1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Overlap mix placement about 1 to 1-1/2 inches (25 to 38 mm) from strip to strip to ensure proper compaction of mix along longitudinal joints.
   2. Complete a section of asphalt base course before placing asphalt surface course.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.8 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of asphalt course.
   1. Clean contact surfaces and apply tack coat to joints.
   2. Offset longitudinal joints, in successive courses, a minimum of 6 inches (150 mm).
   3. Offset transverse joints, in successive courses, a minimum of 24 inches (600 mm).
   4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."
   5. Compact joints as soon as asphalt will bear roller weight without excessive displacement.
   6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.9 COMPACTION

A. General: Begin compaction as soon as placed paving will bear roller weight without excessive displacement. Compact paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
   1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while asphalt is still hot enough to achieve specified density. Continue rolling until asphalt course has been uniformly compacted to the following density:
   1. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent or greater than 96 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while asphalt is still warm. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

E. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, asphalt. Compact by rolling to specified density and surface smoothness.

F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.10 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
   1. Base Course: Plus or minus 1/2 inch (13 mm).
   2. Surface Course: Plus 1/4 inch (6 mm), no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot (3-m) straightedge applied transversely or longitudinally to paved areas:
   1. Base Course: 1/4 inch.
   2. Surface Course: 1/8 inch.
   3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch (6 mm).

C. Asphalt Traffic-Calming Devices: Compact and form asphalt to produce the contour indicated and within a tolerance of plus or minus 1/8 inch (3 mm) of height indicated above pavement surface.

3.11 SURFACE TREATMENTS

A. Fog Seals: Apply fog seal at a rate of 0.10 to 0.15 gal./sq. yd. (0.45 to 0.7 L/sq. m) to existing asphalt pavement and allow to cure. With fine sand, lightly dust areas receiving excess fog seal.

B. Slurry Seals: Apply slurry coat in a uniform thickness according to ASTM D 3910 and allow to cure.

1. Roll slurry seal to remove ridges and provide a uniform, smooth surface.

3.12 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of asphalt courses will be determined according to ASTM D 3549.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

D. Asphalt Traffic-Calming Devices: Finished height of traffic-calming devices above pavement will be measured for compliance with tolerances.

E. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979 or AASHTO T 168.
   1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
   2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.
      a. One core sample will be taken for every 1000 sq. yd. (836 sq. m) or less of installed pavement, with no fewer than three cores taken.
      b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

F. Replace and compact hot-mix asphalt where core tests were taken.

G. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.13 FIELD QUALITY ACCEPTANCE

A. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979 or AASHTO T 168.

   1. Reference maximum theoretical density will be determined by averaging results from four samples of asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
   2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.
      a. One core sample will be taken for every 1000 sq. yd. (836 sq. m) or less of installed pavement, with no fewer than three cores taken.

B. Replace and compact asphalt where core tests were taken.

C. Remove and replace or install additional asphalt where test results or measurements indicate that it does not comply with specified requirements

3.14 WASTE HANDLING

A. General: Handle asphalt-paving waste according to approved waste management plan required in Section 017419 "Construction Waste Management and Disposal."

END OF SECTION 321216

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SECTION 321313 – WALKS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This work shall consist of construction of walks and curb ramps of specified materials in conformity with lines, grades, and dimensions shown on the plans.

1.2 RELATED SECTIONS

A. 32 12 16: Asphalt Paving.

B. 31 00 00: Earthwork.

1.3 REFERENCES

A. City of Dayton Construction and Material Specifications (CMSD), Latest Edition (2020).

PART 2 - PRODUCTS

2.1 MATERIALS

A. All materials used in the concrete mixture, the proportioning and mixing shall conform to CMSD Item 499 Class D concrete and CMSD Item 608.

B. Expansion joint material: CMSD Item 705.03

PART 3 - EXECUTION

3.1 As a minimum, conform to CMSD Item 608. Additionally, conform to the following:

A. Excavation shall be made to the required depth and to a width that will permit the installation and bracing of forms. The sub grade shall be shaped and compacted to meet the requirements of Section 31 00 00: Earthwork.

B. Forms shall be of wood or metal and extend for the full depth of the concrete, and of sufficient strength to resist the pressure of the concrete without springing.

3.2 PLACING AND FINISHING

A. The sub-grade shall be moistened thoroughly immediately prior to placing concrete. The concrete shall be deposited in a single layer. It shall be struck off with a template and smoothed with a wood float or fine broom to obtain a sandy texture. No plastering will be permitted. All outside edges and joints shall be edged with a ¼ inch radius-edging tool. The surface of the walks shall be divided into blocks by grooves equally spaced at approximately five-foot intervals, to form rectangular blocks. Expansion joints shall be formed around all appurtenances such as manholes or utility poles extending into and through the sidewalk.

B. Transverse expansion joint strips ½ inch in thickness and extending the full depth of the walk shall be placed at intervals of 20 feet. Expansion joint strips at least ½ inch in thickness shall also be installed between the junction of the walk with all curbs and any fixed structures, extending the full depth of the walk unless otherwise specified on the plans.

C. The surface of the walk shall have a transverse slope of 1/4 inch per foot, with the low side adjacent to the roadway.

D. Provide turned-down edge where indicated.

END OF SECTION 32 13 13

SECTION 32 16 13.16 – CAST-IN-PLACE CONCRETE CURBS

PART 1 GENERAL

1.1 WORK INCLUDED:

A. The following in general describes the work included in this section:
   1. Concrete curb constructed close to conformity with line, grades and crossection shown on the drawing.

B. Excavation and backfill

C. Joints and sealant

D. Curb cuts and curb ramps

1.2 RELATED SECTIONS

A. Section 31 00 00: Earthwork

B. Section 32 12 16: Asphalt Paving

C. Section 32 13 13: Walks

1.3 REFERENCES

A. City of Dayton Construction and Material Specifications (CMSD), (Latest Edition).

PART 2 PRODUCTS

2.1 MATERIALS

A. Class D concrete in accordance with Item 451 and 499 and the ratio and size of aggregate shall be ordered to secure a workable mix

B. Biituminous joint sealer per Item 705.04 or 705.11

C. Expansion joint material per Item 705.03.

D. City of Dayton Concrete Barrier Curb per STD DWG 8/45

2.2 SUBMITTALS

A. Submit mix design for approval.

PART 3 EXECUTIONS

3.1 The installation requirement shall be in accordance with CMSD Item 609 as a minimum. Additionally, conform to the following:

A. Forms and Joints
   1. Curb forms shall be approved metal forms. They shall be securely braced and held to line and grade specified. The inner surface of the forms shall be clean and coated with suitable oil immediately before the concrete is placed.

2. All curb not constructed integral with the base or pavement shall have ¼ inch contraction joints constructed at 10-foot intervals. The joint may be constructed with the use of metal separator plates, by the use of a grooving tool, or sawed in accordance with CMSD Item 451. The depth of joint for curb shall average 15% or more of the curb height. The bottom of the saw kerf shall slope to the pavement for curb. The joint shall be filled with joint sealer. Where expansion joints occur in the abutting pavement, they shall be provided for by separation of the section being placed with 1 inch preformed joint filler.
3. When the curb is integral with the base of pavement, joints of the type used in the pavement shall be constructed in the curb except that if the pavement joints are filled with CMSD Item 705 material, any type may be used. The curb joints shall be spaced identically with the joints in the base or pavement.
4. Curb forms shall be left in place for such length of time that the removal of same does not crack, shatter or otherwise injure the concrete.
5. Where the curbs built under this item are to later serve as a support for a finishing machine in the placing of a surface course, the alignment of the supporting edges shall be such that the distance between the curbs shall nowhere vary more than ½ inch from that specified.
6. Approved flexible forms of steel or wood may be used for construction of circular curb where radius is 200 feet, or less.

B. Placing
1. The concrete shall be placed in the forms, prepared as above described, in layers thin enough to permit thorough spading. It shall be spaded in such a manner as to eliminate all voids. Provide internal mechanical vibration during placement.
2. Concrete for curb which is to be integral with the concrete base or pavement shall be placed while the concrete is plastic, except when the presence of finishing equipment on the forms at the end of the day's run makes this impossible. When this condition prevails 5/8 inch round deformed rods shall be placed vertically in the pavement at one-foot intervals and in a line 3 inches inside of and parallel to the edge forms. These rods shall extend to within 1-½ inches of the sub grade or sub base and 2 inches above the pavement surface when placed. Immediately before the concrete curb is placed, the surface of the pavement or base on which the concrete curb is to be placed shall be flushed with mortar which contains one part cement to two parts sand. The mortar shall be worked into the surface cavities by brushing.

C. Curb Machine
1. Concrete curb may be placed with a self-propelled machine. The proper density and cross section shall be obtained by forcing the concrete through a mold of the proper cross section. Where a track is used, the track on which the machine operates shall be set and held to the exact line and grade given on the plans. The concrete shall be of such consistency that it can be molded into the desired shape and then will remain as placed without slumping of the vertical faces.

D. Finishing
1. The top of the curb shall be floated in such a manner to thoroughly compact the concrete and produce a smooth and even surface. The addition of extra mortar to secure this result will not be permitted. The edge of the curb shall be rounded by the use of a tool especially designed for the purpose. The exposed face of the curb shall

be rubbed with a float immediately after removing the forms. Unnecessary tool marks shall be eliminated. The finished surface shall be free of irregularities and waves and shall be uniform in texture. Provide light broom finish.

E. Protection
   1. Concrete curb shall be cured in accordance with CMSD Item 609 except that membrane cure shall be applied at a rate of not less than 1 gallon per 200 square feet of surface.
   2. Use white-pigmented liquid membrane curing compound.

3.2 ACCEPTANCE CRITERIA

A. The curb grade profile shall be in conformance to the contract document. The maximum variation allowed is 1/8" per 10 feet.

END OF SECTION 32 16 13.16

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SECTION 32 17 23 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This work shall consist of furnishing and applying retro-reflective pavement marking materials in accordance with the lines and dimensions shown on the plans or as described herein. All pavement markings shall conform with the requirements of the "Ohio Manual of Uniform Traffic Control Devices for Streets and Highways".

1.2 RELATED SECTIONS

A. 321216: Asphalt Paving

1.3 REFERENCES

A. City of Dayton Construction and Material Specifications (CMSD) (latest edition)

B. Ohio Department of Transportation Construction and Material Specifications (ODOT), Latest Edition (2023), online version 01/06/2024.

1.4 QUALITY ASSURANCE

A. Pavement markings shall be free of uneven edges, over-spray, or other readily visible defects which, in the opinion of the Associate Architect, detract from the appearance or function of the pavement markings. Methods and equipment used for pavement preparation, marking, and marking removal shall be subject to the approval of the Associate Architect.

PART 2 - **PRODUCTS**

2.1 MATERIALS

A. The traffic paint shall be of a formulation, identified by a code number, prequalified by the Laboratory and shall have the same composition as the paint of the code number approved by prequalification.

B. Traffic Paint:

1. Traffic Paint per CMSD Item 740.02
2. Glass Beads, Type A per CMSD Item 740.09

C. Thermoplastic Pavement Marking:

1. Thermoplastic pavement marking per CMSD Item 740.04
2. Glass beads, Type C per CMSD Item 740.09

PART 3 - EXECUTION

3.1 PAVEMENT PREPARATION

A. The Contractor shall clean all visible loose or foreign material from the surface to be marked. The Contractor shall power broom clean all surfaces where gore markings or edge lines are to be applied. Portland cement concrete painting shall not be done until the concrete in the areas to be painted is clean of membrane curing material and in a dry condition necessary for painting.

3.2 PAINT APPLICATION

A. The Contractor shall transfer the entire contents of each paint container to the striper tank. Pavement marking materials shall be applied uniformly to the surface to be marked. The paint shall be thoroughly mixed at all times during application. Thinning shall not be permitted. Pavement markings shall be applied only when the surface is clean and dry, and when the temperature of the surface is above 40 F. Construction work such as shoulder paving, seeding and mulching shall be scheduled and performed in a manner to avoid damage to applied pavement markings.

B. Lines shall be applied as solid, dashed or dotted stripes, either singly or in combination, as shown on the plans. Dashed lines shall be applied in a 40-feet cycle consisting of a 10-foot dash and a 30-foot gap between dashes, unless otherwise shown on the plans. Dashed lines, which are to be applied over plainly visible existing dashed lines, shall begin within 6 inches of the beginning of the existing dash, unless otherwise directed by the Associate Architect. Dotted lines shall be applied in a 6-foot cycle consisting of a 2-foot dot and a 4-foot gap between dots.

C. Paint shall be applied at the following rates:

	Gallons per Mile Line				
Width of Line, In.	4	6	8	12	24
Solid Line	16	24	32	48	96
Dashed Line	4	6	-	-	-
Dotted Line	5 1/3	8	-	-	-

D. When paint is applied to new bituminous pavement surfaces, the specified application rate shall be increased 25 percent.

E. Glass beads shall be applied to the wet paint so that the beads are embedded and retained in the paint and uniformly covers the paint surface. The rate of application shall be not less than 6 pounds of glass beads per gallons of paint applied.

F. The temperature of fast dry paint at the discharge point shall be in the range of 140-170F.

G. Lines shall be sharp, well defined, and retro-reflective. The width of line applied shall be the width specified plus or minus ¼ inch. Fuzzy lines, excessive over-spray, or non-uniform application is unacceptable. Lines will be inspected at night to verify proper retro-reflectivity. Pavement markings that are improperly applied, improperly located, or non-retro-reflective shall be corrected. Lines applied with insufficient material quantities shall be properly reapplied or shall be subject to acceptance with deduction as provided in CMSD Item 642. Improperly located lines shall be removed by a method approved by the Engineer and lines shall be applied in the correct locations at the Contractor's expense, including the furnishing of approved materials.

3.3 THERMOPLASTIC APPLICATION

A. Application shall be per CMSD Item 644

3.4 LAYOUT AND PREMARKING

A. The Contractor shall lay out the locations of all lines, words and other symbols to assure their proper placement. When applying longitudinal or transverse lines, the Contractor shall use existing lines, construction joints or pre-marking to guide his marking equipment.

B. On projects where resurfacing or other operations will result in obliteration of the existing pavement markings, the Contractor shall establish reference points to assure proper placement of restored markings.

C. "T" marking of no-passing zones shall be established by the Contractor in accordance with the contract plans or a no-passing zone log provided by the Associate Architect.

D. Pre-marking shall be located from survey data or reference points and offset so as to parallel the theoretical edge of the marking lines at a maximum distance of one inch. Templates are required for the layout of arrows, words and other symbols.

E. Pre-marking for longitudinal lines shall be placed at 40-foot intervals and shall not exceed 2 inches in width or 12 inches in length.

F. The layout and pre-marking lines shall be approved by the Associate Architect before marking operations are started.

3.5 LINE PLACEMENT TOLERANCE

A. Pavement marking lines shall be straight or smoothly curved, true to the alignment of the pavement, and shall not deviate laterally from the proper location at a rate of more than 2 inches in 100 feet. No deviation greater than 3 inches will be permitted.

3.6 EDGE LINES

A. Lane line shall be 4-inch wide retro-reflective thermoplastic stripes offset six inches from the edge of pavement.

3.7 CENTER LINES

A. Center lines shall be single yellow retro-reflective thermoplastic stripe between contiguous lanes of pavement carrying traffic in opposite directions. Each stripe shall be 6 inches wide, dashed.

3.8 PARKING LOTS STALL MARKINGS

A. Parking lot stall marking lines shall be continuous yellow painted stripes, 4 inches in width.

3.9 SYMBOL ON PAVEMENT

A. Symbols on pavement shall be retro-reflective painted yellow markings. Paint shall be applied at the rate of 1 gallon to each 100 square feet.

3.10 SPECIAL REQUIREMENT

A. All painted pavement markings applied to new asphalt pavement are to be re-applied after one year.

END OF SECTION 32 17 23

SECTION 32 92 00 - TURFS AND GRASSES

PART 1 – GENERAL

1.01 DESCRIPTION

A. This item shall consist of furnishing all seed, commercial fertilizer, mulching material, and water and placing and incorporating as specified; and mowing the resulting cover as needed to maintain a maximum height of 3 inches.
B. All disturbed areas not covered by Building and Pavement or Landscaping shall be seeded as specified herein.

1.02 REFERENCES

A. City of Dayton Construction and Material Specifications, (CMSD).

1.03 RELATED SECTIONS

A. 31 22 19: Finish Grading.

1.04 JOB CONDITIONS

A. The areas to be seeded under this item shall include all areas disturbed within the right-of-way lines. All areas outside of the specified limits where the vegetative growth has been injuriously disturbed or destroyed by the Contractor shall be restored and seeded in accordance with these specifications, by the Contractor at his expense.
B. Commercial fertilizers shall be obtained by the Contractor from a dealer or manufacturer whose brands and grades are registered or licensed by the State of Ohio, Department of Agriculture.
C. All seed and fertilizer shall be stored in a dry location and be protected from freezing.
D. All seeding is to be done March 15 to April 15 and August 15 to September 15.

PART 2 – PRODUCTS

2.01 SEEDS

A. All seeds specified shall meet the current specifications on file with the City of Dayton Construction and Material Specifications, (CMSD).
B. All seeds proposed to be used under this item shall be approved by the State of Ohio, Department of Agriculture, Division of Plant Industry, and shall meet the requirements of these specifications.

C. The Owner reserves the right to test, reject or approve all seed after delivery on the project.
D. All seeds are to be furnished in separate varieties, separately packaged or bagged, and shall be labeled, tagged or marked in accordance with CMSC Item 659.

2.02 MULCHING MATERIAL

A. Materials used for mulching shall be straw or hay. They shall be reasonably free of weed/seed and such foreign materials as may detract from their effectiveness as mulch or injurious to desired plant growth.

PART 3 – EXECUTION

3.01 FERTILIZING

A. The standard application of fertilizer shall be at the rate of 20 pounds per 1000 square feet. Another analysis, in the same ration, may be used by varying the application rate to produce the same values specified. Either dry or liquid fertilizer may be used and shall be distributed in an even pattern over the specified area, then thoroughly disked, barrowed or raked into the soil to a depth of 12inches.
B. Areas of the project which were seeded and mulched during preceding seasons (three months or more) shall be re-fertilized. The fertilizer shall be applied to the surface without incorporation into soil at one half the normal rate. This operation shall be performed after repair seeding and mulching operations have been completed.

3.02 SEEDING AND MULCHING

A. All areas to be seeded shall be free of rock and other foreign material 1 inch or greater in any dimension and shall be satisfactorily shaped and finished. Hand raking will be required if machines do not provide results equivalent to hand raking.

B. The seed shall be thoroughly mixed and then evenly sown over the prepared areas at the rate of 3 pounds per 1000 square feet. Seed shall be sown dry or hydraulically.

C. All areas to be seeded shall be seeded with seed conforming to CMSD Item 659

D. Immediately after sowing, the area shall be raked, dragged or otherwise treated so as to cover the seed to a depth of approximately ¼ inch. The operation of seed sowing shall not be performed when the ground is frozen or muddy, or when soil or weather conditions would prevent the proper soil preparation and subsequent operations as specified. Sowing of Crown Vetch shall not be permitted during September or October.

E. Within 48 hours after any given area is seeded, vegetative mulching material shall be evenly placed over all seeded areas at the rate of approximately 2 tons per acre for straw, or 3 tons per acre for hay, when seeding is performed between the dates of March 15 and October 15, and at the approximate rate of 3 tons per acre for straw, of 4 ½ tons per acre for hay, when seeding is performed between the dates of October 15 and March 15 of the succeeding year except those areas defined in 659.09 which shall be mulched at not less than one half the specified rate.

F. Mulching materials shall be kept in place with asphalt emulsion applied at a minimum rate of 60 gallons per ton of mulch or by methods as are approved or may be otherwise required to prevent displacement of material. An additional application of 30 gallons of asphalt emulsion per ton of mulch shall be applied to the shoulder area, starting at the berm edge and extending out for a distance of 10 feet. Emulsion shall be nontoxic to plants and shall be so prepared that it will not change in transportation or storage. Mulching which is displaced shall be replaced at once but only after the seeding or other work which preceded the mulching and which work was damaged as a result of displacement of mulching material has been acceptably repaired.

G. The Contractor shall maintain all seeded a Bluegrass (Poa pratensis) mulched areas until final inspection. Maintenance shall also include providing protection from traffic by placing signs or barricades, and repairing any areas damaged following the seeding or mulching operation due to wind, water, fire or other causes. Such damaged areas shall be repaired to re-establish the condition and grade of the area prior to seeding and shall then be re-fertilized, reseeded and remulched as directed by the Associate.

H. When an estimated quantity of "Repair Seeding and Mulching" is listed in the proposal, it is for repair of damages or erosion where the regular seeding ad mulching operations have been acceptably performed in stages on significant portions of the project. This applies even to new sites, as some seeding will not grow or will be damaged. Such repairs of these areas shall be made at the direction of the Engineer when the damage or erosion is not due to fault or negligence of the Contractor. The repairs shall be made prior to completion of the project by reworking or reshaping to grade and then re-fertilizing, reseeding, and mulching. Reworking or reshaping of slope shall include bringing in addition material. If necessary, and using equipment to restore slopes to grade. Such work will be measured and paid for as "Repair Seeding and Mulching." When damage or erosion of these areas occurs as a result of the fault or negligence of the Contractor, the areas shall be satisfactorily repaired and re-fertilized, reseeded, and mulched at no additional cost to the Owner.

I. The Contractor shall be responsible for the production of a good close stand of grass free of weeds and bare spots. All maintenance including watering, fertilizing, weeding, mowing and repair shall be the responsibility of the Contractor until final acceptance by the Owner.

J. Seed should not be sown when the wind velocity exceeds 5 mph.

K. Protect paving and building surfaces from asphalt emulsion.

L. Conform to applicable requirements of CMSD Item 659.

END OF SECTION 32 92 00

SECTION 33 05 13 — MANHOLES AND STRUCTURES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope: Contractor shall furnish all labor, materials, equipment and incidentals necessary to provide manhole shown, specified and otherwise required to complete the Work.

B. General:

1. Structures shall conform in shape, size, dimensions, material, and other item to the details shown on the Drawings or as approved by the A/E during shop drawing submittal.
2. Metal frames, grates, covers, steps and similar required items shall be as shown
3. Concrete shall be as specified under Division 3.

C. Related Work Specified Elsewhere:

1. Section 31 00 00, Earthwork

D. Coordination:

1. Comply with the pertinent requirements of Item 830 and Item 831 of The City of Dayton Construction and Material Specifications.
2. Whenever requirements conflict, this section governs.

1.2 QUALITY ASSURANCE

A. Reference Standards:

1. ASTM C 478, Precast Reinforced Concrete Manhole Sections.
2. City of Dayton Constrction Material Specifications (CMSD).

1.3 SUBMITTALS:

A. Submit in Accordance with Division One for Shop Drawings, Product Data and Samples.

B. Samples: Submit for approval samples of brick, block, gaskets and all accessories required for the manholes.

C. Shop Drawings: Submit for approval Shop Drawings of design and construction details of all precast concrete.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE MANHOLES

A. Precast manholes shall conform to the details shown. Manhole bases will be precast unless otherwise approved.

B. Except where otherwise specified, manhole sections shall conform to ASTM C 478.

C. Precast manhole bases shall be of approved design and of sufficient strength to withstand the loads to be imposed upon them.

D. Mark date of manufacture and name or trademark of manufacturer on inside of barrel.

E. Unless a larger size is required by the Drawings, the barrel of precast manholes shall be constructed of 48-inch diameter standard reinforced concrete manhole sections.

F. A precast eccentric cone, as shown or approved, shall be provided at the top of the manhole barrel to receive the cast iron frame and cover. The slab or cone shall be of acceptable design and of sufficient strength to safely support an H-20 loading.

G. Manhole sections shall contain manhole steps, uniformly spaced, 12 inches minimum, and 16 inches maximum on centers, accurately positioned and embedded in the concrete.

2.2 MISCELLANEOUS METALS

A. Metal frames, covers, steps, toe pockets and similar required items shall be provided as shown and in accordance with the Sections on Metal Fabrications.

PART 3 - EXECUTION

3.1 PLASTERING

A. The outside of grading rings shall be neatly plastered with ½ inch of cement mortar as the Work progresses.

3.2 MANHOLE BASES

A. Precast bases shall be set on a foundation as shown. Precast base shall be set at the proper grade and carefully leveled and aligned.

3.3 PRECAST MANHOLE SECTIONS

A. Set sections vertical with steps and sections in true alignment.

B. Install sections, joints and gaskets in accordance with manufacturer's recommendations.

C. Lifting holes shall be sealed tight with a solid rubber plug driven into the hole and the remaining void filled with 1 to 2 cement sand mortar.

3.4 GRADING RINGS

A. Grading rings or brick stacks shall be used for all precast manholes where required. Stacks shall be a maximum of 12 inches in height, constructed on the roof slab or cone section on

which the manhole frame and cover shall be placed. The height of the stack shall be such as necessary to bring the manhole frame to the proper grade.

3.5 GRADING AT MANHOLES

A. All manholes in unpaved areas shall be built as shown or directed to an elevation higher than the surrounding ground.

B. The ground surface shall be graded to drain away from the manhole. Fill shall be placed around them to the level of the upper rim of the manhole frame, and the surface evenly graded on a 1 to 5 slope to the existing surrounding ground unless otherwise shown.

3.6 MANHOLE WATERTIGHTNESS

A. All manholes shall be free of visible leakage. Each manhole shall be tested for leaks and inspected, and all leaks shall be repaired in a manner subject to the ASSOCIATES' directions.

END OF SECTION 33 05 13

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SECTION 33 11 00 - WATER UTILITY DISTRIBUTION PIPING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Underground water distribution system complete, ready for operation, including all appurtenant structures, and connections to new house service lines and to existing water supply.

1.02 REFERECES

A. City of Dayton Construction and Material Specifications (CMSC), Latest Edition.
B. American Society for Testing and Materials (ASTM)

1.03 RELATED WORK

A. Section 033000, Cast in Place Concrete.
B. Excavation, Trench Width, Pipe Bedding, Backfill, Shoring, Sheeting, and Bracing: Section 310000, Earthwork.

1.04 QUALITY ASSURANCE

A. Products Criteria

1. Nameplate: Nameplate identifiable trademark securely affixed in a conspicuous place on equipment or name or trademark cast integrally with equipment, stamp, or otherwise permanently marked on each items of equipment.

B. Comply with regulations of Public Utility Authorities having jurisdiction in all cases where water lines are connected to Public Utility Service.

1.05 SUBMITTALS

A. Shop Drawings, Product Data and Samples, furnish the following:
Literature and Data: Submit the following as one package:

1. Piping
2. Gasket
5. Post Indicator
6. Valve Boxes

3.	Valves	7.	Stops
4.	Stop Boxes	8.	Tracer wire

PART 2 – PRODUCTS

2.01 PIPE MATERIALS

A. All water main material and installations shall be in accordance with the current rules and regulations of the current City of Dayton Construction and Material Specifications.

B. All material including pipe, fittings, valves and hydrants must meet AWWA Specifications.

C. All water main material shall be Ductile Iron Pipe - Class 52, meeting AWWA C151, or PVC - SDR18, meeting AWWA C900 and approved by Factory Mutual System Class 200.

D. All plastic water main and services shall be installed with Blue 12 gauge Copperhead HS reinforced tracer wire manufactured by Copperhead Industries, LLC. Blue for water. Connectors for services or splices shall be locking blue "snakebite" corrosion proof wire connectors manufactured by Copperhead Industries, LLC.

E. Bell Joint Restraints - Use Field Lock by U.S. Pipe or Approved Equivalent

F. Mechanical Joint Restraints - EBA Iron Megalug Retainer Gland or Equivalent

G. Fire Hydrants - Acceptable Hydrant is Mueller Super Centurion with Stoz Nozzle, with 4-5 feet of bury, or as required to meet grade. Hydrant settings will conform to the Columbus STD DWG L6409 Type B Setting and cannot be inside the sidewalk unless otherwise specifically approved due to location by the Engineer. Hydrant shall be installed per manufacturer's specifications. All hydrants shall be restrained by the use of an anchor tee and anchor couplings from the main through the valve to the hydrant. The break-off line of the hydrant must be 1 1/2" above finished grade.

H. Valves - Approved gate valve manufactures are Clow and Mueller. Valves shall be AWWA C509 resilient wedge, iron body and bronze mounted. All valves that exceed 4 1/2' bury shall be furnished with a permanent valve stem extension and guide.

I. Valve Box - 3 piece cast iron 6" diameter nominal, adjustable screw type, cover marked "WATER" domestic made only.

PART 3 – EXECUTION

3.01 HOUSE SERVICE LINES

A. Install water service lines to point of connection within approximately five feet outside of buildings to which such service is to be connected and make connections thereto. If (house) services have not been installed provide temporary caps.

3.02 REGRADING

A. Raise or lower existing valve boxes and fire hydrants in re-grading area to finished grade.

3.03 PIPE LAYING, GENERAL

A. Do not lay pipe or unstable material, in wet trench, or when trench weather conditions are unsuitable.
B. Support pipe laid in fill area at each joint, by brick or concrete piers carried down to solid undistributed earth.
C. Do not lay pipe in same trench with other pipes or utilities.
D. Hole pipe securely in place while joint is being made.
E. At least one foot shall separate water lines vertically from other pipes or underground structures.
F. Where water pipes cross sanitary sewers or are laid parallel and adjacent to them, bottom or water pipe shall be separated by not less than 1.5 feet above top of sewer and 10 feet horizontally.
G. Do not walk over, walk on, pipes in trenches until covered by layers of earth well tamped in place to a depth of 12 inches over pipe.
H. Full length of each section of pipe shall rest solidly upon pipe bed with recesses excavated to accommodate bells or joints. Do not lay pipes on wood blocking.Install water lines to avoid heating trenches and storm and sanitary sewer lines.
I. Clean interior of pipe thoroughly of all foreign matter before installation. Keep pipes clean during laying operations by means of plugs or other methods. When work is not in progress, securely close open ends of pipe and fittings to prevent water, earth, or other substances from entering.
J. Tees, plugs, caps, bends and hydrants on pipe installed underground shall be anchored. (Pipe clamps and tie rods, or concrete thrust blocks may be used.) Type of pipe and soil conditions determines methods.

K. Close pipe openings with caps or plugs during installation. Tightly cover and protect equipment against dirt, water and chemical or mechanical injury. At completion of all work thoroughly clean exposed materials and equipment.

3.04 LAYING DUCTILE IRON PIPE: AWWA C600

A. In accordance with CMSD Item 824.03

3.05 JOINTS

A. Mechanical: AWWA C111. Provide sufficient quantities of bolts, nuts, glands and gaskets for each socket opening on pipe and fittings.
B. Push-On: Apply thin film of lubricant to gasket and place in proper position contour of bell. Insert beveled end of joining pipe and make contact with gasket. Do not caulk. Only lubricant furnished by manufacturer of pipe shall be used.
C. Flanges: AWWA C115. Install only in concrete pits. Must be watertight and set and not less than 6 inches from walls to floor.

3.06 PLACEMENT OF VALVES

A. No valves shall be placed under pavement except where shown on drawings.
B. Clean valve interior before installation.
C. Place valve box cover flush with finished grade.
D. All valves shall be on concrete blocks.

3.07 PIPE SLEEVES

A. Install where water lines pass through retaining walls. Properly secure in place, with approximately ¼ inch space between pipe and enclosing sleeve, before concrete is poured. Caulk angular opening between pipe and sleeves, and seal with asphaltic compound consisting of bituminous materials mixed with mineral matter. Install piping so that no joint occurs within a sleeve. Split sleeves may be installed where existing lines pass through new construction.

3.08 FLUSHING AND DISINFECTING

A. Water main cleaning and flushing per CMSD Item 802.03
B. Flush and disinfect new water lines in accordance with AWWA C601.
C. Material

1. Liquid Chlorine: Fed. Spec. BB-C – 120.
2. Hypochlorite: Fed. Spec. O-C – 114 or Fed. Spec. O-S – 602, Grade B.

3.01 TESTS

A. Test water line in accordance with CSMC Item 802 and the current rules and regulations of the City of Dayton.

END OF SECTION 33 11 00

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SECTION 33 40 00 – STORM DRAINAGE UTILITIES

PART 1 - GENERAL

1.1 DESCRIPTION

A. This work shall consist of the construction of pipe sewers complete in place. The work shall be in accordance with these Specifications and in conformity with the lines and grades shown on the plans, or as established by the Architect. This work shall include: Excavating for pipes and bedding for same, including clearing and grubbing, fill or embankment, and the removal of all materials necessary for placing the pipe except removals listed separately; furnishing and placing granular or concrete bedding, concrete backing and granular or concrete backfill as required; constructing and subsequently removing all necessary cofferdams, cribs and sheeting; constructing and placing all necessary bulkheads; removal of water; all pipe joints; furnishing, installing and testing all necessary pipe of the types specified or shown on the plans; joining to existing and proposed sewers and appurtenances as required; restoration of disturbed facilities and surfaces; maintenance of traffic, drainage and existing facilities all as shown on the drawings and as specified.

1.2 REFERENCES

A. City of Dayton Construction and Material Specifications (CSMD).

B. Ohio Department of Transportation Construction and Material Specifications (ODOT), Latest Edition (2019).

C. American Society for Testing and Materials (ASTM)

1.3 SUBMITTALS

A. Submit inlet and pipe information for approval.

PART 2 - PRODUCTS

2.1 PIPE MATERIALS

A. Reinforce Concrete pipe conforming to CSMD item 821

2.2 INLETS

A. Provide catch basins / curb inlets / manholes and yard drains as follows: CSMD Item 830 and Item 831.

B. Yard drain basins shall be Nyloplast 12" Ductile Iron Grate and Frame or approved equal.

C. Provide underdrains as follow: CMSD Item 605.

2.3 BEDDING

A. Type 1 bedding shall be used conforming to CMSD Item 810.

PART 3 - EXECUTION

3.1 CONSTRUCTION

A. Conform to CSMD Item 801

3.2 LAYING CONDUIT

A. Conform to CSMD Item 821.04.

3.3 JOINING CONDUIT

A. Conform to CSMD Item 821.05

3.4 BACKFILLING

A. Conform to CSMC Item 810

3.5 CLEARING SITE AND RESTORING DAMAGED SURFACES

A. After the backfilling has been completed, the Contractor shall immediately remove and dispose of all surplus material including dirt and rubbish.

B. After the above work is completed, the Contractor shall remove all tools and other property belonging to him, leaving the entire site in good condition.

END OF SECTION 33 40 00