# PROJECT MANUAL

**PROJECT:**

DEXTER HIGH SCHOOL – NEW FIELD HOUSE CIVIL
2200 North Parker Road
Dexter MI 48130

**OWNER:**

DEXTER COMMUNITY SCHOOL DISTRICT
2704 Baker Road
Dexter, MI 48130

**TMP PROJECT NO.:** 25026E

**DESIGN RELEASE 3**

**DATE:** April 3, 2026

**ISSUED FOR:** CONSTRUCTION DOCUMENTS

## ARCHITECT

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# *Dexter High School – New Field House - Civil*

***25026E***

*This Document has been prepared under the supervision of the Architect and/or Professional Engineer as indicated by their individual License Seals affixed hereon.*

## *Professional License Seals*

| | | |
|---|---|---|
| *Seal* | *Seal* | |
| ***TMP Architecture, Inc.*** *Architect* | ***Beckett & Raeder INC*** *Civil Engineer* | |

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**END OF SECTION**

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**LIST OF DRAWINGS**

**1.01 GENERAL**

A. Drawings: Drawings consist of the Contract Drawings including drawings listed on the TITLE SHEET page of the separately bound drawing set titled Dexter vHigh School - New Field House - Civil, dated April 3, 2026 and any subsequent Addenda and Contract modifications which may occur.

**END OF SECTION 00 0115**

# SECTION 00 3100 - AVAILABLE PROJECT INFORMATION

## PART 1 GENERAL

### 1.01 SUMMARY

A. Project Manual uses Appendixes to organize information that does not conform to 3-part specification formatting as defined by the Construction Specifications Institute (CSI).

1. Appendix information does not have a six-digit number or title as defined by CSI's MasterFormat.

### 1.02 EXISTING CONDITIONS

A. Certain information relating to existing surface and subsurface conditions and structures is available to bidders as Information Available to Bidders, but will not be part of Contract Documents, as follows:

1. Geotechnical Report: Entitled 2025 Dexter School Bond Program - DHS Fieldhouse and Site Improvements and Al Ritt Stadium Lighting, dated December 29, 2025.
   a. Copy is attached to Project Manual in Appendix 1.

## PART 2 PRODUCTS -- NOT USED

## PART 3 EXECUTION -- NOT USED

## END OF SECTION 00 3100

# SECTION 00 8200 - AVAILABILITY OF ELECTRONIC FILES

## AVAILABILITY OF ELECTRONIC FILES

### 1.01 POLICY

A. As a service to Contractor, subcontractors, vendors, material suppliers and others needing electronic copies of Drawings, the Architect will provide CAD files electronically in accordance with the following policy:

1. By acceptance it is understood and agreed that the data and medium being supplied is to be used only for the project referenced.
2. It is further understood and agreed that the undersigned will hold TMP Architecture, Inc. and its Consultants harmless and indemnify TMP Architecture, Inc. and its Consultants from all claims, liabilities, losses, and so forth, including attorney's fees arising out of the use or misuse of the transferred files.
3. It is understood and agreed that the files transmitted are prepared from CAD files current at the time of preparation. All files are AutoCAD version 2018 dwg files.
4. This information does not waive the need to verify and review current field conditions and the status of Addenda and/or Bulletin documentation.
5. As a record of information to be transmitted, TMP Architecture, Inc. will prepare a duplicate electronic back-up for its record.
6. Compensation Fee for providing this material will be as follows:
   a. Base Fee of $250 for 1 to 3 Drawings.
   b. Base Fee of $500 for 4 to 10 Drawings.
   c. For each additional Drawing after 10, the fee is $40 per Drawing.
      1) Example: 11 Drawings = $540.
7. A signed copy of the Release Form and Fee must be provided before files will be released.

### 1.02 REQUEST PROCEDURE

A. To receive Drawing CAD files the Release Form must be completed in full and submitted to the Construction Manager to be forwarded to the Project Manager at TMP Architecture, Inc.

1. A signed copy of the Release Form must be submitted.
   a. Faxed or emailed copies will be accepted.
2. Upon remittance of the signed Release Form and Fee, allow five working days for processing.
3. Transmission of Drawings will be provided electronically after the receipt of Fee.

### 1.03 RELEASE FORM

A. Release Form is located immediately after this Section. Refer to Section 00 8200.01 Electronic Files Release Form.

**END OF SECTION 00 8200**

**SECTION 00 8200.01 - TMP ELECTRONIC FILE RELEASE FORM**

.

**RE: AUTHORIZATION FORM FOR CAD FILE TRANSFERS**
**PROJECT NAME: _____**
**TMP PROJECT NO. : _____ BID PACK NO._____**

**DEAR SIR/MADAM:**

A. Per your request, TMP Architecture, Inc. will electronically transmit requested CAD files upon receipt of an original signed copy of this form which states the conditions of agreement and the receipt of the required compensation fee.
B. By acceptance it is understood and agreed that the data and medium being supplied is to be used only for the project referenced.
C. It is further understood and agreed that the undersigned will hold TMP Architecture, Inc. and its Consultants harmless and indemnify TMP Architecture, Inc. and its Consultants from all claims, liabilities, losses, and so forth, including attorney's fees arising out of the use or misuse of the transferred files.
D. It is understood and agreed that the items transmitted are prepared from CAD files current at the time of preparation. All files are [AutoCAD version 2018 dwg files].
E. This information does not waive the need to verify and review current field conditions and the status of Addenda and/or Bulletin documentation.
F. As a record of information to be transmitted, TMP Architecture, Inc. will prepare a duplicate electronic back-up for its record.
G. Compensation for providing this material will be as follows:
    1. Base Fee of [$250] for 1 to 3 Drawings.
    2. Base Fee of [$500] for 4 to 10 Drawings.
H. For each additional Drawing after 10 the fee is [$40] per Drawing.
I. Example: [11 drawings = $540].
J. Payment must be provided along with a signed copy of this form before files will be released. Please remit to [Construction Manager] to be forwarded to the Project Manager at TMP Architecture, Inc. and allow five working days for processing.

**FEE: $_____**
**REQUESTED DRAWINGS: _____**
_____
_____

**FIRM REQUESTING FILES:**

Company: _____
Address: _____
Signed:_____Date: _____
Printed Name / Title: _____
Email: _____

**TO BE COMPLETED BY TMP ARCHITECTURE, INC.**

Released(signed by): _____TMP Architecture, Inc.
Printed Name/Title:_____ Date: _____

**END OF SECTION 00 8200.01**

# SECTION 00 8201 - TMP ELECTRONIC BIM RELEASE FORM

## AVAILABILITY OF ELECTRONIC BIM FILES

### 1.01 GENERAL PROVISIONS

A. This document establishes the terms and protocols of the following: ownership, development, uses, transmission, and sharing of Building Information Models and other Digital Data for the Project.

B. All the following will be removed from the Revit file prior to the file being distributed; sheets, title blocks, cover sheets, details, schedules, views (all) and TMP and consultant company information.

C. Definitions

1. Building Information Model or Model. A Building Information Model (BIM), or Model, is a digital representation of the Project or a subset of the Project. A Model is a collection of one or more Model Portions, each of which is an assemblage of Model Elements.
2. Model Portion or Portion. A Model Portion, or Portion, is a subset of a Model as designated within this document. The Model Portion may be designated by discipline, trade, area, location, phase, or other mutually agreeable distinction.
3. Model Author or Author. A Model Author, or Author, is the Project Participant responsible for developing a Model Portion.
4. Model Version. A Model Version is a specific edition of a Model or Model Portion that is sufficiently identifiable as unique and unchanged as of the time it is saved by its Author.
5. Model Element. A Model Element is a digital representation of a component, system, object, or assembly within a Model.
6. Non-Graphic Information. Non-Graphic Information is any information other than the physical geometry associated with, or attached to, a Model Element. Examples of Non-Graphic Information include equipment or product manufacturer, maintenance schedule, tonnage of HVAC, etc.
7. Digital Data. Digital Data is information created or stored for the Project in digital form.
8. Level of Development. The Level of Development (LOD) establishes the minimum dimensional, spatial, quantitative, and qualitative aspects of a Model Element, and the degree to which Project Participants may rely upon the Model Element when developed to that level in the Model. Level of Development (LOD) is established by Architect and Consultants at time of BIM Kickoff Meeting and is discipline specific as defined in section (1.05) below.
9. Project Participant. A Project Participant is the owner of, and any entity or individual providing services or work on, the Project.

D. This document shall not be construed to create a contractual relationship of any kind between Project Participants who are not otherwise in contractual privity.

### 1.02 POLICY

A. At the request of, and as a courtesy for the convenience of the Construction Manager, Architect will provide BIM files in accordance with the following policy:

1. By acceptance it is understood and agreed that the Model being supplied is to be used only for the project referenced.
2. It is further understood and agreed that the undersigned will hold TMP Architecture, Inc., and its Consultants harmless and indemnify TMP Architecture, Inc. and its Consultants from all claims, liabilities, losses, and so forth, including attorney's fees arising out of the use or misuse of the transferred files.

3. Data contained on these electronic files are part of our instruments of service and shall not be used by you or anyone else receiving these data through or from you for any purpose other than as a convenience in the preparation of shop drawings for the referenced project. Any other use or reuse by you or by others will be at your sole risk and without liability or legal exposure to us. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against our firm, our officers, directors, employees, agents or subconsultants that may arise out of or in connection with your use of the electronic files.
4. The digital data is diagrammatic and represents the general intent of systems. The plans and 3D model are not to be considered coordination, fabrication, or shop drawing level. Coordination with all trades is required. Additional fittings, offsets, and components will be required to complete each system and to avoid interferences with other systems including the structural, sheet metal, HVAC piping, plumbing, electrical, fire protection, etc. and/or other space constraints.
5. It is understood and agreed that the files transmitted are prepared from BIM files current at the time of preparation. All files are Revit version decided upon between the Architect and Design Team at time of Project Kick-off meeting, unless mutually decided upon by the Architect and Consultant Team throughout the project duration. The Revit version for this Model or Model Portion will be stated below.
6. This document shall indicate the Model Version at time of release. Reliance upon the Model, Model Portion, or Model Elements shall be limited to the uses listed within this document. Any reliance on a Model Version not in accordance with this document shall be at the Project Participant's sole risk.
7. These electronic files are not construction documents. Differences may exist between these electronic files and corresponding hard-copy construction documents. We make no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed or sealed hard-copy construction documents prepared by us and the electronic files, the signed or sealed hard-copy construction documents shall govern. You are responsible for determining if any conflict exists. By your use of these electronic files, you are not relieved of your duty to fully comply with the contract documents, including, and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.
8. Because information presented on the electronic files can be modified, unintentionally or otherwise, we reserve the right to remove all indicia of ownership and/or involvement from each electronic display.
9. This information does not waive the need to verify and review current field conditions and the status of Addenda and/or Bulletin documentation.
10. As a record of information to be transmitted, TMP Architecture, Inc. will prepare a duplicate electronic back-up for its record.
11. Compensation Fee for providing this material will be as follows: $750.00 .
12. A signed copy of this document, stating Project, Model Version, Level of Development at time of release, and intended use of Model or Model Portion must be provided before files will be released.
13. If Project Participants discover or become aware of any discrepancies, inconsistencies, errors, or omissions in any Model Version, they shall promptly report the discrepancy, inconsistency, error, or omission in writing to the Author and the Architect.
14. Under no circumstances shall delivery of the electronic files for use by you be deemed a sale by us, and we make no warranties, either express or implied, of merchantability and fitness for any particular purpose. In no event shall we be liable for any loss of profit or any consequential damages as a result of your use or reuse of these electronic files.

15. By transmitting Digital Data, the transmitting Party does not convey ownership right in the Digital Data or in the software used to generate the Digital Data. Unless otherwise granted in a separate document, the receiving Party's right to use, or modify Digital Data is specifically limited to the intended use of Model or Model Portion as indicated within this document.
16. The electronic files are issued only as supplemental information for the convenience of the Construction Manager.

**1.03 LEVEL OF DEVELOPMENT**

A. Level of Development Descriptions: The LOD descriptions included within this document shall be used to identify the minimum required characteristics for each Model Element at progressively developed levels. Other Project Participants may only rely on a Model Element consistent with the minimum required characteristics for the designated LOD.

1. Non-Graphic Information: Non-Graphic Information may be attached to a Model Element. If Non-Graphic Information has a different degree of reliance than the Model Element to which it is attached, then the Model Author shall indicate the difference.
2. LOD 100: The Model Element may be graphically represented in the Model with a symbol or other generic representation but does not satisfy the requirements for LOD 200. Information related to the Model Element can be derived from other Model Elements.
3. LOD 200: The Model Element is generically and graphically represented within the Model with approximate quantity, size, shape, location, and orientation.
4. LOD 300: The Model Element, as designed, is graphically represented within the Model such that its quantity, size, shape, location, and orientation can be measured.
5. LOD 350: The Model Element, as designed, is graphically represented within the Model such that its quantity, size, shape, location, orientation, and interfaces with adjacent or dependent Model Elements can be measured.
6. LOD 400: The Model Element is graphically represented within the Model with detail sufficient for fabrication, assembly, and installation.
7. LOD 500: The Model Element is a graphic representation of an existing or as-constructed condition developed through a combination of observation, field verification, or interpolation. The level of accuracy shall be noted or attached to the Model Element.

**1.04 REQUESTED PROJECT MODEL**

TMP Project Name: _____

TMP Project Number: _____

Requested Model Portion (Architectural, Structural, Mechanical/Electrical, etc.)

_____

Company Requesting Files: _____

Address: _____

Signed: _____

Printed Name / Title: _____

Email: _____

By signing above, it is understood and agreed that the undersigned will hold TMP Architecture, Inc., and its Consultants harmless and indemnify TMP Architecture, Inc. and its Consultants from all claims, liabilities, losses, and so forth, including attorney's fees arising out of the use or misuse of the transferred files. Reliance upon the Model, Model Portion, or Model Elements shall be limited to the uses listed within this document. Any reliance on a Model Version not in accordance with this document shall be at the Project Participant's sole risk. It is understood and agreed that the items transmitted are current as of date indicated below and this information does not waive the need of the user to verify and review current field conditions and the status of subsequent revisions including Addenda and/or Bulletin Documentation.

**1.05 TO BE COMPLETED BY TMP ARCHITECTURE, INC.**

Model Version: _____

Software Version: _____

Level of Development: _____

Comments: _____

Released (signed by): _____ TMP Architecture, Inc.

Printed Name / Title: _____ Date: _____

**END OF SECTION 00 8201**

## SECTION 01 0005 - RELATED REQUIREMENTS

### PART 1 GENERAL

**1.01 DIVISION 00 AND DIVISION 01**

A. Unless otherwise noted, all provisions of sections and documents in Division 00 and Division 01, including, but not limited to, General Conditions and Supplementary Conditions, relate and apply to all sections and documents within Project Manual; including, but not limited to, sections and documents in Division 00 through Division 48.

**1.02 DRAWINGS**

A. Unless otherwise noted, Drawings relate and apply to all specification sections and documents within Project Manual; including, but not limited to, sections and documents in Division 00 through Division 48.

### PART 2 PRODUCTS -- NOT USED

### PART 3 EXECUTION -- NOT USED

**END OF SECTION 01 0005**

# SECTION 01 2500 - SUBSTITUTION PROCEDURES

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Procedural requirements for proposed substitutions.

### 1.02 RELATED REQUIREMENTS

A. Section 01 2500.01 - TMP Substitution Request Form.

### 1.03 DEFINITIONS

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.
   2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.

B. Substitutions: Any proposed substitution to be evaluated by the Architect and accepted as stipulated below.

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION

### 3.01 GENERAL REQUIREMENTS

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.

B. 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.

C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
   1. Forms included in the Project Manual are adequate for this purpose, and must be used.

D. 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

A. Submittal Time Restrictions:

B. Substitution Request Form: TMP Substitution Request Form must be completed and provided at the beginning of each substitution request.
   1. Refer to Section 01 2500.01 - TMP Substitution Request Form.
   2. Submittals without a completed TMP Substitution Request Form will not be acknowledged, reviewed, or returned. Use only this form; other forms of submission are unacceptable.

C. Instructions to Bidders specifies time restrictions for submitting requests for substitutions during the bidding period.

**3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION**

A. Substitution Request Form: TMP Substitution Request Form must be completed and provided at the beginning of each substitution request.
   1. Refer to Section 01 2500.01 - TMP Substitution Request Form.
   2. Submittals without a completed TMP Substitution Request Form will not be acknowledged, reviewed, or returned. Use only this form; other forms of submission are unacceptable.

B. Submit request for Substitution for Cause immediately upon 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.

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 unanticipated project considerations.

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.

**3.04 RESOLUTION**

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

B. Architect will notify Contractor in writing of decision to accept or reject request.
   1. During construction, Architect's decision following review of proposed substitution will be noted on the submitted form.
   2. During bidding, Architect will approve substitution requests by issuing an Addendum. Substitutions not approved by addendum are rejected.

**3.05 ACCEPTANCE**

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**

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

**END OF SECTION 01 2500**

**SECTION 01 2500.01 - TMP SUBSTITUTION REQUEST FORM**

**SUBSTITUTION REQUEST NUMBER: _____ DATE SUBMITTED: _____**
**TMP PROJECT NUMBER: 25026E PROJECT NAME: DESTER HIGH SCHOOL - NEW FIELD HOUSE - CIVIL**

**SPECIFIED ITEM**

**SPECIFICATION TITLE:_____**
**SPECIFICATION SECTION_____SPECIFICATION ARTICLE/PARAGRAPH: _____**
**SPECIFIED PRODUCT / DESCRIPTION: _____**
**SPECIFIED MANUFACTURER: _____**
**SPECIFIED PRODUCT / MODEL: _____**
**REASON SPECIFIED ITEM CANNOT BE PROVIDED: _____**
**_____**
**_____**

**PROPOSED SUBSTITUTION**

**DESCRIPTION OF PROPOSED SUBSTITUTION: _____**
**_____**
**PROPOSED MANUFACTURER: _____**
**ADDRESS: _____**
**WEBSITE: _____**
**PRODUCT / MODEL: _____**
**YEARS PRODUCT/MODEL HAS BEEN MANUFACTURED: _____**
**DIFFERENCES BETWEEN PROPOSED SUBSTITUTION AND SPECIFIED ITEM: _____**
**_____**
**_____**
**_____**
**_____**
**WILL PROPOSED SUBSTITUTION AFFECT OTHER PARTS OF WORK? ☐ NO ☐ YES**
**IF YES, EXPLAIN HOW: _____**
**_____**
**_____**
**_____**
**HOW WILL SUBSTITUTION BENEFIT THE OWNER: ☐ COST SAVINGS ☐ TIME SAVINGS ☐ OTHER**
**PROVIDE SPECIFIC DETAILS: _____**
**_____**
**_____**
**_____**

**THE FOLLOWING INFORMATION IS REQUIRED; CHECK TO INDICATE INFORMATION IS ATTACHED. (REQUEST WILL BE REJECTED WITHOUT REQUIRED DATA)**

**32.01**

A. ☐ List of references where proposed product has been installed; include address, owner, architect, and date installed.
B. ☐ Product data sheets.
C. ☐ Applicable certificates and test reports.
D. ☐ Comparative Data: Provide point-by-point, side-by-side comparison of specified product and proposed substitution addressing essential attributes specified.

**INDICATE WHICH OF THE FOLLOWING VOLUNTARY INFORMATION IS ATTACHED, IF ANY:**
**☐ DRAWINGS.**
**☐ SAMPLES.**
**☐ OTHER ITEMS: _____**

**SIGNATURE**

**THE UNDERSIGNED CERTIFIES:**

The proposed substitution meets or exceeds the quality level of the specified product, equipment, assembly, or system.
To provide the same warranty for the substitution as for the specified product.
Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
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.
The proposed substitution will have no adverse effects on other work.
The proposed substitution will not affect project schedule.
Waives claims for additional costs or time extension that may subsequently become apparent.

**CONTRACTOR / COMPANY: _____**
**SIGNED BY: _____PRINTED NAME: _____**
**TITLE: _____**
**ADDRESS: _____**
**EMAIL: _____ PHONE: _____**

**ARCHITECT'S RESPONSE**

A. During bidding, Architect will approve substitution requests by issuing an Addendum. Substitutions not approved by addendum are rejected.
B. During construction, Architect will notify Contractor in writing (see below) of decision to accept or reject request, and incorporate the substitution into the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments as provided for in the Conditions of the Contract.

**☐ SUBSTITUTION APPROVED - PROVIDE SUBMITTALS PER SECTION 01 3000 AND RESPECTIVE SECTION FOR WHICH SUBSTITUTION WAS MADE.**
**☐ SUBSTITUTION REJECTED - PROVIDE SPECIFIED MATERIALS.**

**SIGNED BY: _____PRINTED NAME: _____**
**ARCHITECT'S COMMENTS: _____**
**_____**
**_____**

**END OF SECTION 01 2500.01**

# SECTION 01 3000 - ADMINISTRATIVE REQUIREMENTS

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Submittals for review, information, and project closeout.
B. Number of copies of submittals.
C. Requests for Information (RFI) procedures.
D. Submittal procedures.

### 1.02 RELATED REQUIREMENTS

A. Section 01 3000.01 - TMP Submittal and Sample Transmittal Form.

### 1.03 REFERENCE STANDARDS

A. AIA G716 - Request for Information; 2004.
B. CSI/CSC Form 13.2A - Request for Information; Current Edition.

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION

### 3.01 REQUESTS FOR INFORMATION (RFI)

A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
   2. A resolution to an issue which has arisen due to field conditions and affects design intent.
B. 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. Use one of the following:
      a. Use AIA G716 - Request for Information .
      b. Use CSI/CSC Form 13.2A - Request for Interpretation.
      c. Other format acceptable to Architect.
   3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
   4. Submit RFIs through Procore, email, or other approved method agreed to by the Architect and Owner.
      a. RFIs submitted via an internet-based submittal service are to send electronic documents to the Architect via email with a downloadable link.
C. 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. Improper RFIs: Requests not prepared in conformance to requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response and may include an explanatory notation.
   3. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, the Contract Documents, with no additional input required to clarify the question. They will be returned without a response and may include 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.

D. 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. Discrete and consecutive RFI number, and descriptive subject/title.
3. Issue date, and requested reply date.
4. 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).
5. Annotations: Field dimensions and/or description of conditions which have engendered the request.
6. 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.

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

F. 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. Identify and include improper or frivolous RFIs.

G. 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 3:00 PM 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.

H. 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.

## 3.02 SUBMITTAL SCHEDULE

A. Submit to Architect for review a schedule for submittals in tabular format.
1. Submit at the same time as the preliminary schedule.
2. Coordinate with Contractor's construction schedule and schedule of values.
3. Format schedule to allow tracking of status of submittals throughout duration of construction.

4. Arrange information to include scheduled date for initial submittal, specification number and title, description of item of work covered, and role and name of subcontractor.
5. 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.

**3.03 SUBMITTALS FOR REVIEW**

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

**3.04 SUBMITTALS FOR INFORMATION**

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

**3.05 SUBMITTALS FOR PROJECT CLOSEOUT**

A. Submit Correction Punch List for Substantial Completion.
B. Submit Final Correction Punch List for Substantial Completion.
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. Other types as indicated.
D. Submit for Owner's benefit during and after project completion.

**3.06 NUMBER OF COPIES OF SUBMITTALS**

A. Electronic Documents: Submit one electronic copy.
B. Samples: Submit the number specified in individual specification sections, but not less than 3; one (minimum) 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.

**3.07 SUBMITTAL PROCEDURES**

A. Transmittal Form: TMP Submittal and Sample Transmittal Form must be completed and provided at the beginning of each submittal.
   1. Refer to Section 01 3000.01 - TMP Submittal and Sample Transmittal Form.

2. Submittals without a completed TMP Submittal and Sample Transmittal Form will not be acknowledged, reviewed, or returned.

B. Submittals shall be submitted in electronic form.
   1. Exceptions: Physical samples.
      a. Physical Samples must be accompanied by an electronic copy and a hard/physical copy of the completed TMP Submittal and Sample Transmittal Form.

C. Electronic Submittals: Comply with the following:
   1. Submittal process shall be through Procore, email, or other approved method agreed to by the Architect and Owner.
      a. Submittals via an internet-based submittal service are to send electronic documents to the Architect via email with a downloadable link.
   2. File Format: Portable Document Format (PDF).
   3. File Naming: File naming shall be in the following format:
      a. Specification section number, followed by a hyphen, and a consecutive number indicating sequential submittals for that section; followed by a general description of the submittal contents.
         1) Examples:
            (a) Section 07 9200; first submittal:
               (1) 07 9200-01 Joint Sealants
            (b) Section 07 9200; second submittal:
               (1) 07 9200-02 Joint Sealant Color
      b. Resubmittals. For revised resubmittals use original number and a sequential combination numerical and alphabetical suffix; hyphen followed by "R" and a two-digit consecutive number indicating sequential resubmittals for that particular submittal.
         1) Examples:
            (a) Section 07 9200; resubmittal of first submittal of section:
               (1) 07 9200-01-R01 Joint Sealants.
            (b) Section 07 9200; second resubmittal of first submittal of section:
               (1) 07 9200-01-R02 Joint Sealants
            (c) Section 07 9200; first resubmittal of second submittal of section:
               (1) 07 9200-02-R01 Joint Sealant Color
   4. Each Submittal shall be one file, complete with all attachments.
      a. Multi-file submittal will not be acknowledged, reviewed, or returned.

D. General Requirements:
   1. Use a single transmittal for related items.
      a. Each transmittal shall be for one specification section only; do not submit items for multiple sections under the same transmittal.
         1) Multi-section submittals will be acknowledged and returned; stamped "X - Not Approved - Resubmit".
   2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
   3. 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.
   4. 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.
   5. Schedule submittals to expedite the Project, and coordinate submission of related items.
      a. For each submittal for review, allow 14 calendar 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 7 calendardays.

6. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
7. When revised for resubmission, identify all changes made since previous submission.
8. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
9. 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.
10. Submittals not requested will be recognized and returned; stamped "NA - No Action Taken - Not Reviewed"

E. 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 unless specifically called for in individual sections.

F. 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.
4. Non-complying submittals will be acknowledged and returned; stamped "X - Not Approved - Resubmit".

G. 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. Submit actual physical samples.
4. Electronic submittals will not be accepted unless prior approval is received from the Architect. Electronic samples without prior approval will be acknowledged and returned; stamped "X - Not Approved - Resubmit."

**3.08 SUBMITTAL REVIEW**

A. General: Submittals that do not conform to the requirements of this section will not be acknowledged, reviewed, or returned.

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

C. Submittals for Information: Architect will acknowledge and may review. See below for actions to be taken.

D. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
1. Where more than one action has been indicated, each shall apply to that portion of the submittal for which the action is indicated.

E. Architect's review shall not indicate approval of dimensions, quantities or fabrication processes unless specific notations are made by the Architect regarding same.

F. Architect's and consultants' actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:
a. "Reviewed - No Exceptions Taken", "Approved", or language with same legal meaning.
b. "Reviewed with Corrections Noted", "Approved 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.

2. Not Authorizing fabrication, delivery, and installation:
   a. "Revise and Resubmit", "Not Approved - Resubmit", or language with the same legal meaning.
      1) Resubmit revised item, with review notations acknowledged and incorporated.
3. Not Authorizing manufacturer:
   a. Rejected - Resubmit, or language with the same legal meaning.

G. Architect's and consultants' actions on items submitted for information:
1. Items for which no action was taken:
   a. "No Action Taken - Not Reviewed" or "Received" - to notify the Contractor that the submittal has been received for record only.

**END OF SECTION 01 3000**

# SUBMITTAL AND SAMPLE TRANSMITTAL FORM

01 3000.01

| CONST. MANAGER / CONTRACTOR | PROJECT | TMP PROJECT NO. | DATE SUBMITTED | SUBMITTAL NO. |
|---|---|---|---|---|
| Name and Address: | Title: | 25026E | | |
| | Dexter High School – New Field House | * ACTION CODES | | Initial Submittal ☐<br>Resubmittal ☐ |
| Email: | Location: | R Reviewed – No Exceptions Taken<br>RN Reviewed with Corrections Noted<br>RR Revise and Resubmit<br>X Not Approved – Resubmit<br>NA No Action Taken – Not Reviewed | | REVIEWED BY |
| Phone: | 2200 North Parker Road<br>Dexter, MI 48130 | | | TMP ☐<br>Consultant ☐<br>Reviewer: |

| SPECIFICATION SECTION NO. | SUBCONTRACTOR / MANUFACTURER | ITEM DESCRIPTION | NO. OF SAMPLES | NO. OF SAMPLES RETURNED | ACTION CODE * | DATE REVIEWED | DATE RETURNED |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| Transmittal shall be for one specification section only; do not submit items from multiple sections under the same transmittal. Multi-section submittals will be returned; stamped "X - Not Approved - Resubmit" | | | | | | | |
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*Submittal Stamps may be placed on subsequent blank page.*

| CONTRACTOR COMMENTS | ARCHITECT COMMENTS | The undersigned certifies that the above submitted items have been reviewed in detail and are correct and in strict conformance with the Contract Documents except as otherwise noted. NOTE: Approval of items submitted does not relieve Contractor from complying with all requirements of the Contract Documents. |
|---|---|---|
| | | CONTRACTOR NAME |
| | | |
| | | SIGNATURE |
| | | |

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# SECTION 01 4000 - QUALITY REQUIREMENTS

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Submittals.
B. Quality assurance.
C. References and standards.
D. Testing and inspection agencies and services.
E. Contractor's design-related professional design services.
F. Control of installation.
G. Mock-ups.
H. Tolerances.
I. Manufacturers' field services.
J. Defect Assessment.

### 1.02 REFERENCE STANDARDS

A. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025b.
B. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2026.
C. ASTM E699 - Standard Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components; 2016.

### 1.03 DEFINITIONS

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.
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.

### 1.04 CONTRACTOR'S DESIGN-RELATED PROFESSIONAL DESIGN SERVICES

A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.
B. Base design on performance and/or design criteria indicated in individual specification sections.

### 1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. 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 a statement or certification attesting that design data complies with criteria indicated, such as building codes, loads, functional, and similar engineering requirements.
    2. Include signature and seal of design professional responsible for allocated design services on calculations and drawings.
C. Test Reports: After each test/inspection, promptly submit 1 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.

D. 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.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

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.

**1.06 QUALITY ASSURANCE**

A. Testing Agency Qualifications:
1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time specialist and responsible officer.

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.

**1.07 REFERENCES AND STANDARDS**

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

B. Obtain copies of standards where required by product specification sections.

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

**1.08 TESTING AND INSPECTION AGENCIES AND SERVICES**

A. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

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

C. Contractor Employed Agency:

1. Testing agency: Comply with requirements of ASTM E329, ASTM E543, and ASTM E699.
2. Inspection agency: Comply with requirements of ASTM E329.
3. Laboratory Staff: Maintain a full time specialist on staff to review services.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 CONTROL OF INSTALLATION**

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
B. Comply with manufacturers' instructions, including each step in sequence.
C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
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.
E. Have work performed by persons qualified to produce required and specified quality.
F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

**3.02 MOCK-UPS**

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.
B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.
C. Integrated Exterior Mock-ups: Construct integrated exterior mock-up as indicated on drawings. Coordinate installation of exterior envelope materials and products as required in individual Specification Sections. Provide adequate supporting structure for mock-up materials as necessary.
D. Notify Architect 5 working days in advance of dates and times when mock-ups will be constructed.
E. Provide supervisory personnel who will oversee mock-up construction. Provide workers that will be employed during the construction at Project.
F. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.
G. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
H. Obtain Architect's approval of mock-ups before starting work, fabrication, or construction.
   1. Make corrections as necessary until Architect's approval is issued.
I. Architect will use accepted mock-ups as a comparison standard for the remaining Work.
J. 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**

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

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
C. Adjust products to appropriate dimensions; position before securing products in place.

**3.04 TESTING AND INSPECTION**

A. See individual specification sections for testing and inspection required.
B. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor 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.
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.
D. Contractor 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.
   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 48 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.
E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
F. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

**3.05 MANUFACTURERS' FIELD SERVICES**

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.
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**

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

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**

# SECTION 01 4100 - REGULATORY REQUIREMENTS

## PART 1 GENERAL

### 1.01 SUMMARY OF REFERENCE STANDARDS

A. Regulatory requirements applicable to this project are the following:
   1. ASHRAE Std 90.1 I-P-2019 - Energy Standard for Buildings Except Low-Rise Residential Buildings; 2019, with Errata and Addenda (2021).
   2. Barrier Free Code: Comply with the following:
      a. Michigan Building Code; 2021.
      b. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
   3. School Fire Safety Rules: Michigan School Fire Safety Rules; 2016.
      a. Includes NFPA 101-2012 - Life Safety Code; 2012, plus amendments.
   4. Building Code: Michigan Building Code; 2021.
   5. Plumbing Code: Michigan Plumbing Code; 2021.
   6. Mechanical Code: Michigan Mechanical Code; 2021.
   7. Electrical Code: NFPA 70 - National Electric Code; 2023.
      a. Includes 2023 Michigan Construction Code - Part 8 Electrical Code Rules.
   8. Elevator Code: Comply with the following:
      a. ASME A17.1 - Safety Code for Elevators and Escalators; 2016.
      b. ASME A18.1- Safety Standard for Platform Lifts and Stairway Chairlifts; 2017.
      c. 2023 Michigan Elevator Safety Board General Rules.
   9. Boiler Code: Michigan Boiler Code.
      a. Includes the following:
         1) ASME Boiler and Pressure Vessel Codes; 2019.
         2) National Board Inspection Code; 2019.
         3) PA 407 Skilled Trades Regulation Act; 2016.
   10. Energy Code: Michigan Commercial Energy Code; 2021.
      a. Includes ASHRAE Std 90.1 I-P-2019 - Energy Standard for Buildings Except Low-Rise Residential Buildings; 2019.
   11. Existing Building Code: Michigan Rehabilitation Code; 2021.

B. Where specification sections reference more current standards or codes, comply with the more restrictive requirements unless notified in writing by Architect.

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION - NOT USED

**END OF SECTION 01 4100**

# SECTION 01 4216 - DEFINITIONS

## PART 1 GENERAL

### 1.01 SUMMARY

A. This section supplements the definitions contained in the General Conditions.

B. Other definitions are included in individual specification sections.

### 1.02 DEFINITIONS

A. Furnish: To supply, deliver, unload, and inspect for damage.

B. Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.

C. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.

D. Project Manual: The book-sized volume that includes the procurement requirements (if any), the contracting requirements, and the specifications.

E. Provide: To furnish and install.

F. Supply: Same as Furnish.

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION - NOT USED

**END OF SECTION 01 4216**

# SECTION 01 4219 - REFERENCE STANDARDS

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Requirements relating to referenced standards.

### 1.02 QUALITY ASSURANCE

A. For products or 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.

B. Comply with the reference standard of date of issue , except where a specific date is established by applicable code.

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

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

## PART 2 PRODUCTS -- NOT USED

## PART 3 EXECUTION -- NOT USED

## END OF SECTION 01 4219

# SECTION 01 4533 - CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Code-required special inspections.
B. Submittals.

### 1.02 ABBREVIATIONS AND ACRONYMS

A. AHJ: Authority having jurisdiction.
B. NIST: National Institute of Standards and Technology.

### 1.03 DEFINITIONS

A. Code or Building Code: Michigan Building Code; 2021, specifically Chapter 17 - Special Inspections and Tests.
B. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.
C. Special Inspection:
   1. Special inspections are inspections and testing of materials, installation, fabrication, erection or placement of components and connections mandated by the AHJ that also require special expertise to ensure compliance with the approved Contract Documents and the referenced standards.
   2. Special inspections are separate from and independent of tests and inspections conducted by Owner or Contractor for the purposes of quality assurance and contract administration.

### 1.04 REFERENCE STANDARDS

A. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025b.

### 1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Special Inspection Agency Qualifications: Prior to the start of work, the Special Inspection Agency is required to:
   1. Submit agency name, address, and telephone number, names of full time specialist 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. Submit certification that Special Inspection Agency is acceptable to AHJ.
C. Special Inspection Reports: After each special inspection, Special Inspector is required to promptly submit at least two copies of report; one to Architect and one to the AHJ.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of Special Inspector.
      d. Date and time of special inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of special inspection.
      h. Date of special inspection.
      i. Results of special inspection.
      j. Compliance with Contract Documents.

2. Final Special Inspection Report: Document special inspections and correction of discrepancies prior to the start of the work.

D. Fabricator Special Inspection Reports: After each special inspection of fabricated items at the Fabricator's facility, Special Inspector is required to promptly submit at least two copies of report; one to Architect and one to AHJ.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of Special Inspector.
      d. Date and time of special inspection.
      e. Identification of fabricated item and specification section.
      f. Location in the Project.
      g. Results of special inspection.
      h. Verification of fabrication and quality control procedures.
      i. Compliance with Contract Documents.
      j. Compliance with referenced standard(s).

E. Test Reports: After each test or inspection, promptly submit at least two copies of report; one to Architect and one to AHJ.
   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 or inspection.
      h. Date of test or inspection.
      i. Results of test or inspection.
      j. Compliance with Contract Documents.

**1.06 SPECIAL INSPECTION AGENCY**

A. Owner will employ services of a Special Inspection Agency to perform inspections and associated testing and sampling in accordance with ASTM E329 and required by the building code.

B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

**1.07 QUALITY ASSURANCE**

A. Special Inspection Agency Qualifications:
   1. Independent firm specializing in performing testing and inspections of the type specified in this section.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 SCHEDULE OF SPECIAL INSPECTIONS, GENERAL**

A. Frequency of Special Inspections: Special Inspections are indicated as continuous or periodic.
   1. Continuous Special Inspection: Special Inspection Agency is required to be present in the area where the work is being performed and observe the work at all times the work is in progress.
   2. Periodic Special Inspection: Special Inspection Agency is required to be present in the area where work is being performed and observe the work part-time or intermittently and at the completion of the work.

**3.02 SPECIAL INSPECTIONS**

A. Special inspections and testing shall be for materials, installation, fabrication, erection or placement of components and connections as indicated on Drawings, but not less than that required by the building code.

**END OF SECTION 01 4533**

# SECTION 01 5639 - TEMPORARY TREE AND PLANT PROTECTION

## PART 1 - GENERAL

### 1.01 RELATED DOCUMENTS

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

### 1.02 SUMMARY

A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

B. Related Sections:

1. Section 31 1000 "Site Clearing" for selective removal of existing plants.

### 1.03 DEFINITIONS

A. Caliper: Diameter of a trunk measured by a diameter tape at 6 inchesabove the ground for trees up to, and including, 4-inchsize; and 12 inchesabove the ground for trees larger than 4-inchsize.

B. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.

C. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and indicated on Drawings.

D. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

### 1.04 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For each type of the following:

1. Organic Mulch: 1-quart volume of organic mulch; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch.

C. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

1. Species and size of tree.
2. Location on site plan. Include unique identifier for each.
3. Reason for pruning.
4. Description of pruning to be performed.
5. Description of maintenance following pruning.

### 1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified arborist and tree service firm.

B. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

C. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

D. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1. Use sufficiently detailed photographs or videotape.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

### 1.06 QUALITY ASSURANCE

A. Arborist Qualifications: Certified Arborist as certified by ISA.

B. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.

C. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:
    a. Construction schedule. Verify availability of materials, personnel, and equipment needed to make progress and avoid delays.
    b. Enforcing requirements for protection zones.
    c. Arborist's responsibilities.
    d. Arborist supervision.
    e. Field quality control.

**1.07 PROJECT CONDITIONS**

A. The following practices are prohibited within protection zones:
    1. Storage of construction materials, debris, or excavated material.
    2. Parking vehicles or equipment.
    3. Foot traffic.
    4. Erection of sheds or structures.
    5. Impoundment of water.
    6. Excavation or other digging unless otherwise indicated.
    7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
B. Do not direct vehicle or equipment exhaust toward protection zones.
C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

**PART 2 - PRODUCTS**

**2.01 MATERIALS**

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of one of the following:
    1. Type: Shredded hardwood.
    2. Size Range: 3 inchesmaximum, 1/2 inchminimum.
    3. Color: Natural.
B. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and weighing a minimum of 0.4 lb/ft.; remaining flexible from minus 60 to plus 200 deg F; inert to most chemicals and acids; minimum tensile yield strength of 2000 psi and ultimate tensile strength of 2680 psi; secured with plastic bands or galvanized-steel or stainless-steel wire ties; and supported by tubular or T-shape galvanized-steel posts spaced not more than 96 inches apart.
    1. Height: 48 inches.
    2. Color: High-visibility orange, nonfading.
C. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes pre-punched and reinforced; legibly fabricated with non-fading lettering and as follows:
    1. Text: “TREE PROTECTION ZONE – NO ACCESS”.

**PART 3 - EXECUTION**

**3.01 EXAMINATION**

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
B. For the record, prepare written report, endorsed by arborist, listing conditions detrimental to tree and plant protection.
C. All work within or immediately adjacent to the root zone of any tree shall be observed by a certified arborist. No work shall take place without the arborist present.

**3.02 PREPARATION**

A. Locate and clearly identify trees, shrubs, and other vegetation protection zones.

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

**3.03 TREE- AND PLANT-PROTECTION ZONES**

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people from easily entering protected area except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Architect. Install one sign spaced approximately every 50-feet on protection-zone fencing, but no fewer than four signs with each facing a different direction.

C. Maintain protection zones free of weeds and trash.

D. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

E. Maintain protection-zone fencing and signage in good condition as acceptable to Architect and remove when construction operations are complete and equipment has been removed from the site.

1. Relocate protection-zone fencing as needed to facilitate construction operations. Relocations shall be approved by Landscape Architect prior to beginning or resuming construction operations.

**3.04 EXCAVATION**

A. General: Excavation within protection zones shall be by pneumatic operations according to requirements in Section 31 2000 "Earth Moving."

B. Excavation near Trees: Where excavation is required within protection zones, pneumatically excavate under or around tree roots or tunnel under the roots by drilling, auger boring, or piercing. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots under direct supervision of arborist and as required for root pruning.

C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots under direct supervision of arborist and as required for root pruning.

D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

**3.05 ROOT PRUNING**

A. Prune roots that are affected by temporary and permanent construction. Prune roots as follows:

1. Notify arborist. All excavation and root pruning shall occur under direct supervision of a certified arborist.
2. Cut roots manually by hand or pneumatically digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
3. Cut Ends: Do not paint cut root ends.
4. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
5. Cover exposed roots with burlap and water regularly.
6. Backfill immediately according to requirements in Section 31 2000 "Earth Moving."

**3.06 CROWN PRUNING**

A. Crown or branch pruning shall be limited to that required for clearance of new light poles and fixtures. Branches to be pruned shall be marked for approval of Architect and arborist prior to pruning.

B. Prune branches approved branches under direct supervision of certified arborist as follows:
   1. Pruning Standards: Prune trees according to ANSI A300 (Part 1) and the following:
      a. Type of Pruning: Cleaning, Raising, Reduction.
   2. Cut branches with sharp pruning instruments; do not break or chop.
   3. Do not apply pruning paint to wounds.

C. Remove pruning debris and legally dispose of off-site.

**3.07 FIELD QUALITY CONTROL**

A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

**3.08 REPAIR, REPLACEMENT AND MITIGATION**

A. Damage to trees, shrubs, and other vegetation will be taken very seriously and require mitigation at the Contractor’s expense. Actively and aggressively protect all existing trees and vegetation during construction.

B. Repair, replacement, and mitigation for damaged trees and other vegetation will be determined solely by the Architect and Owner based on the severity of immediate and long-term damage.

**3.09 DISPOSAL OF SURPLUS AND WASTE MATERIALS**

A. Disposal: Remove excess excavated material, displaced trees, trash and debris, and legally dispose of them off Owner's property.

**END OF SECTION 01 5639**

# SECTION 01 6000 - PRODUCT REQUIREMENTS

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Re-use of existing products.
B. Transportation, handling, storage and protection.
C. Product option requirements.
D. Substitution limitations.
E. Procedures for Owner-supplied products.
F. Maintenance materials, including extra materials, spare parts, tools, and software.

### 1.02 SUBMITTALS

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.
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.
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 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.
B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.
C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.
D. Specific Products to be Reused: The reuse of certain materials and equipment already existing on the project site is required.
    1. Refer to Drawings and Section 02 4100 - Demolition.

### 2.02 NEW PRODUCTS

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

### 2.03 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
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.
C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.
D. Available Products: Products specified by naming one or more Manufacturers as an Available Product indicates that these Manufacturers' products may be provided but other comparable products and Manufacturers not named may also be provided without submitting a request for substitution.

**2.04 MAINTENANCE MATERIALS**

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

B. Deliver and place in location as directed; obtain receipt prior to final payment.

**PART 3 EXECUTION**

**3.01 SUBSTITUTION LIMITATIONS**

A. See Section 01 2500 - Substitution Procedures.

**3.02 OWNER-SUPPLIED PRODUCTS**

A. 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.

B. 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**

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

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

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

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

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

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

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

**3.04 STORAGE AND PROTECTION**

A. 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.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

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

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

F. Provide off-site storage and protection when site does not permit on-site storage or protection.

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

H. Comply with manufacturer's warranty conditions, if any.

I. Do not store products directly on the ground.
J. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
K. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
L. Prevent contact with material that may cause corrosion, discoloration, or staining.
M. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
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

A. Examination, preparation, and general installation procedures.
B. Requirements for alterations work, including selective demolition.
C. Pre-installation meetings.
D. Cutting and patching.
E. Surveying for laying out the work.
F. Cleaning and protection.
G. Starting of systems and equipment.
H. Demonstration and instruction of Owner personnel.
I. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
J. General requirements for maintenance service.

### 1.02 REFERENCE STANDARDS

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

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. 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.
    6. Include in request:
        a. Identification of Project.
        b. Location and description of affected work.
        c. Necessity for cutting or alteration.
        d. Description of proposed work and products to be used.
        e. Effect on work of Owner or separate Contractor.
C. Project Record Documents: Accurately record actual locations of capped and active utilities.
D. Warranties: For each affected material under warranty, submit written verification, signed by manufacturer of existing materials, stating that the Owner's full warranty will remain in effect after cutting and patching operations have been completed

### 1.04 QUALIFICATIONS

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,

### 1.05 PROJECT CONDITIONS

A. Use of explosives is not permitted.
B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
D. Perform dewatering activities, as required, for the duration of the project.

E. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
F. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
   1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
   2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
G. 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. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
H. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
   1. Outdoors: Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm.
   2. Indoors: Limit conduct of especially noisy interior work to the hours of 6 pm to 7 am.
I. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
J. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

**1.06 COORDINATION**

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.
B. Notify affected utility companies and comply with their requirements.
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.
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.
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.
F. Coordinate completion and clean-up of work of separate sections.
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.

**1.07 WARRANTIES**

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

**PART 2 PRODUCTS**

**2.01 PATCHING MATERIALS**

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

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

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
C. Examine and verify specific conditions described in individual specification sections.
D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
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

A. Clean substrate surfaces prior to applying next material or substance.
B. Seal cracks or openings of substrate prior to applying next material or substance.
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

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
B. Require attendance of parties directly affecting, or affected by, work of the specific section.
C. Notify Architect 5 calendar days in advance of meeting date.
D. Prepare agenda and preside at meeting:
    1. Review conditions of examination, preparation and installation procedures.
    2. Review coordination with related work.
E. Record minutes and distribute copies within two days after meeting to participants, with 1 copies to Architect, Owner, participants, and those affected by decisions made.

### 3.04 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.
B. Promptly notify Architect of any discrepancies discovered.
C. Contractor shall locate and protect survey control and reference points.
D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
E. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
G. Utilize recognized engineering survey practices.

H. 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.

I. Periodically verify layouts by same means.

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

**3.05 GENERAL INSTALLATION REQUIREMENTS**

A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.

B. 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.

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

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

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

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

**3.06 ALTERATIONS**

A. Drawings showing existing construction and utilities are based on casual field observation only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
   1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
   2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.

D. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.
   2. Relocate items indicated on drawings.
   3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
   4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.

2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
   b. Provide temporary connections as required to maintain existing systems in service.
4. Verify that abandoned services serve only abandoned facilities.
5. Remove abandoned pipe, ducts, conduits, and equipment , including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

F. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.

G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
   1. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.

H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

I. Refinish existing surfaces as indicated:
   1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
   2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

J. Clean existing systems and equipment.

K. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

L. Do not begin new construction in alterations areas before demolition is complete.

M. Comply with all other applicable requirements of this section.

**3.07 CUTTING AND PATCHING**

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

B. See Alterations article above for additional requirements.

C. 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.

D. 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.

E. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
G. Restore work with new products in accordance with requirements of Contract Documents.
H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
I. 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.
J. 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.
        a. This includes painted surfaces.
        b. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
    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.

**3.08 PROGRESS CLEANING**

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

**3.09 PROTECTION OF INSTALLED WORK**

A. Protect installed work from damage by construction operations.
B. Provide special protection where specified in individual specification sections.
C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
F. 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.
G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

**3.10 SYSTEM STARTUP**

A. Coordinate schedule for start-up of various equipment and systems.
B. Notify Architectand Owner 7 calendar days prior to start-up of each item.
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.

D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
E. Verify that wiring and support components for equipment are complete and tested.
F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
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.
H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

**3.11 DEMONSTRATION AND INSTRUCTION**

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.
B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at equipment location.
C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.
E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

**3.12 ADJUSTING**

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

**3.13 FINAL CLEANING**

A. Use cleaning materials that are nonhazardous.
B. 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.
C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
E. Clean filters of operating equipment.
F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.
G. Clean site; sweep paved areas, rake clean landscaped surfaces.
H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

**3.14 CLOSEOUT PROCEDURES**

A. Make submittals that are required by governing or other authorities.
B. Accompany Contractor 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.

C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
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.
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.
F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.
H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

**3.15 MAINTENANCE**

A. Provide service and maintenance of components indicated in specification sections.
B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

**END OF SECTION 01 7000**

# SECTION 01 7800 - CLOSEOUT SUBMITTALS

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Project record documents.
B. Operation and maintenance data.
C. Warranties and bonds.

### 1.02 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. 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.
   4. Submit two sets of revised final documents in final form within 10 days after final inspection.
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

A. General:
   1. Project Record Documents include:
      a. Complete set of Record Drawings.
      b. Complete set of Record Submittals.
      c. Complete set of Specifications.
   2. Project Record Documents shall be submitted in electronic form.
      a. File Format: Portable Document Format (PDF).
      b. Files shall be named and organized in a searchable, easy to understand, system.
   3. Ensure entries are complete and accurate, enabling future reference by Owner.
   4. Record information concurrent with construction progress.
B. Record Drawings: Record Drawings shall include the following:
   1. Complete set of Drawings.
      a. Indicate and record actual construction including, but not limited to, the following:
         1) Show all systems and assemblies as they exist at completion of the Work.
         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.
   2. Addenda.
   3. Change Orders and other modifications to the Contract.

C. Record Submittals: Record Submittals shall include the following:
   1. Complete set of Submittals, including resubmittals.
   2. Shop Drawings shall indicate all field changes and other variations from the Submittal as originally reviewed by Architect.
D. Specifications: Specifications shall include the following:
   1. Complete Project Manual including all specifications, front end material, reports, and information available to bidders, as originally bid.
   2. Addenda.
   3. Change Orders and other modifications to the Contract.

**3.02 OPERATION AND MAINTENANCE DATA**

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

A. For Each Product, Applied Material, and Finish:
   1. Product data, with catalog number, size, composition, and color and texture designations.
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.
C. Additional information as specified in individual product specification sections.
D. 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**

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.
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.
C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
D. Include color coded wiring diagrams as installed.
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.
F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
G. Provide servicing and lubrication schedule, and list of lubricants required.
H. Include manufacturer's printed operation and maintenance instructions.

I. Include sequence of operation by controls manufacturer.
J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
K. Provide control diagrams by controls manufacturer as installed.
L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
M. Include test and balancing reports.
N. Additional Requirements: As specified in individual product specification sections.

**3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS**

A. General:
   1. Operational and Maintenance Manuals include:
      a. Operational and maintenance data.
      b. Operational and maintenance data for materials and finishes.
      c. Operational and maintenance data for equipment and systems.
   2. Operational and Maintenance Manuals shall be submitted both in electronic form and as hard copy/durable manuals.
      a. Subject to Owner approval, hard copy/durable manuals may be omitted.
      b. Electronic File Format: Portable Document Format (PDF).
         1) Files shall be named and organized in a searchable, easy to understand, system similar to the descriptions for the hard copy/durable manuals
B. 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.
C. Where systems involve more than one specification section, provide separate tabbed divider for each system.
D. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 3 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
E. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
F. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.
G. 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.
H. 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.
I. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
J. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
K. 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.

**3.06 WARRANTIES AND BONDS**

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.

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

C. Co-execute submittals when required.

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

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

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.

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.

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.

**END OF SECTION 01 7800**

# SECTION 31 1000 - SITE CLEARING

## PART 1 - GENERAL

### 1.01 SUMMARY

A. Section Includes:
   1. Protecting existing vegetation to remain.
   2. Removing above- and below-grade site improvements.
   3. Temporary erosion and sedimentation control.

### 1.02 MATERIAL OWNERSHIP

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

### 1.03 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
   2. Provide alternate routes around closed or obstructed trafficways if required by Owner or authorities having jurisdiction.

B. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where directed by Owner. Refer to plans for irrigation components to be salvaged to Owner.

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

D. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.

## PART 2 - PRODUCTS (not used)

## PART 3 - EXECUTION

### 3.01 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed according to requirements in Section 01 5639 "Temporary Tree and Plant Protection."

C. Protect existing site improvements to remain from damage during construction.
   1. Restore damaged improvements to their original condition, as acceptable to Owner.

### 3.02 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

### 3.03 TREE AND PLANT PROTECTION

A. Protect trees and plants remaining on-site.

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction.

**3.04 EXISTING UTILITIES**

A. Locate, identify, and protect all site utilities.

**3.05 TOPSOIL STRIPPING**

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to depth of 4-inches in a manner to prevent intermingling with underlying subsoil or other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

**3.06 SITE IMPROVEMENTS**

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

B. Sawcut existing pavements at removal limits, or further as required for stable edge condition matching existing jointing. Protect sawcut edges after removals or, if damaged, provide new sawcut immediately prior to installation of new work.

**3.07 DISPOSAL OF SURPLUS AND WASTE MATERIALS**

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

B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials, and transport them to recycling facilities. Do not interfere with other Project work.

**END OF SECTION 31 1000**

# SECTION 31 2000 - EARTH MOVING

## PART 1 - GENERAL

### 1.01 RELATED DOCUMENTS

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

### 1.02 SUMMARY

A. Section Includes:
   1. Excavating and backfilling.

### 1.03 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

B. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

C. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
   1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
   2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
   3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

D. Fill: Soil materials used to raise existing grades.

E. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:
   1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch-wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,700 lbf and stick-crowd force of not less than 18,400 lbf with extra-long reach boom; measured according to SAE J-1179.
   2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp flywheel power and developing a minimum of 47,992-lbf breakout force with a general-purpose bare bucket; measured according to SAE J-732.

F. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

G. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

H. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

I. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

### 1.04 INFORMATIONAL SUBMITTALS

A. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
   1. Classification according to ASTM D 2487.
   2. Laboratory compaction curve according to ASTM D 1557.

B. Shop Drawings: Location and dimensions of Contractor's proposed bore pits.
C. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, which might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

**1.05 PROJECT CONDITIONS**

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
   2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
B. Utility Locator Service: Notify "Miss Dig" for area where Project is located before beginning earth moving operations.
C. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, specified in Section 31 1000 "Site Clearing," are in place.
D. Do not commence earth moving operations until plant-protection measures specified in Section 01 5639 "Temporary Tree and Plant Protection" are in place.
E. The following practices are prohibited within protection zones:
   1. Storage of construction materials, debris, or excavated material.
   2. Parking vehicles or equipment.
   3. Foot traffic.
   4. Erection of sheds or structures.
   5. Impoundment of water.
   6. Excavation or other digging unless otherwise indicated.
   7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
F. Do not direct vehicle or equipment exhaust towards protection zones.
G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

## PART 2 - PRODUCTS

**2.01 SOIL MATERIALS**

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
   1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
D. Engineered Fill: MDOT Class II granular material
E. Bituminous Pavement Sub-base: MDOT Class II granular material
F. Bituminous Pavement Base: MDOT 21AA Limestone
G. Concrete Pavement Base: MDOT 21AA Limestone

**2.02 GEOTEXTILES**

A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
   1. Survivability: Class 2; AASHTO M 288.
   2. Survivability: As follows:

a. Grab Tensile Strength: 157 lbf; ASTM D 4632.
b. Sewn Seam Strength: 142 lbf; ASTM D 4632.
c. Tear Strength: 56 lbf; ASTM D 4533.
d. Puncture Strength: 56 lbf; ASTM D 4833.

3. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
4. Permittivity: 0.5 per second, minimum; ASTM D 4491.
5. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
1. Survivability: Class 2; AASHTO M 288.
2. Survivability: As follows:
a. Grab Tensile Strength: 247 lbf; ASTM D 4632.
b. Sewn Seam Strength: 222 lbf; ASTM D 4632.
c. Tear Strength: 90 lbf; ASTM D 4533.
d. Puncture Strength: 90 lbf; ASTM D 4833.
3. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
4. Permittivity: 0.02 per second, minimum; ASTM D 4491.
5. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

C. Geogrid
1. Between the Aggregate Base and Granular Base:
a. Tensar NX 750 or equivalent
2. Between the Granular Base and Compacted Subgrade:
a. Tensar NX 850 or equivalent

## PART 3 - EXECUTION

### 3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
B. Protect and maintain erosion and sedimentation controls during earth moving operations.
C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

### 3.02 DEWATERING

A. Groundwater and surface water which is free of contamination and sediment may be discharged to a storm drain. Drains must be protected from sediment by using filter fabric or silt sacks. However, if field indicators indicate possible contamination the water cannot be discharged. Note: suspect contaminated groundwater may exhibit chemical or unusual odors, unusual coloring, sheen, and/or contain man-made debris.
B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

### 3.03 EXPLOSIVES

A. Explosives: Do not use explosives.

### 3.04 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include

rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
2. Remove rock to lines and grades indicated to permit installation of permanent construction.

B. Suspect Contaminated Soil, Groundwater, or other Unknown Material:

1. During work activities if suspect contaminated soil, groundwater, or other unknown material is encountered contact the Owner immediately. Suspect contaminated soil may exhibit chemical or unusual odors, staining, unusual coloring, and/or contain man-made debris. Suspect contaminated groundwater may exhibit chemical or unusual odors, unusual coloring, and/or sheen.
2. Immediately cease all excavation, dewatering, transport, or disturbance of the suspect material until given direction by the Owner.

**3.05 BACKFILL**

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Backfill voids with satisfactory soil while removing shoring and bracing.

C. Place and compact backfill of subbase material, free of particles larger than 1 inch in any dimension, in maximum 4-inch lifts.

D. Place and compact final backfill of 6-inch topsoil lift to final subgrade elevation.

**3.06 SOIL MOISTURE CONTROL**

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

**3.07 COMPACTION OF BACKFILLS**

A. Place backfill and fill soil materials in layers not more than 6 inchesin loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under structures, foundations and building slabs, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 98 percent.
2. Under paved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.

D. Compact base materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under structures, foundations and building slabs, compact each layer of base material in maximum 6-inch lefts at 98 percent.
2. Under paved areas, compact each layer of base material in maximum 6-inch lefts at 98 percent.

**3.08 GRADING**

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.

2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

**3.09 GEOGRID INSTALLATION**

A. Place geogrid promptly according to manufacturer's written instructions. Overlap longitudinal and transverse joints per manufacturer’s recommendations.

B. Do not let geogrid be exposed to sunlight for more than 500 hours prior to burying.

**3.10 FIELD QUALITY CONTROL**

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material and maximum lift thickness comply with requirements.
3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

**3.11 PROTECTION**

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

**3.12 DISPOSAL OF SURPLUS AND WASTE MATERIALS**

A. Remove surplus satisfactory soil and waste materials, including topsoil, trash, and debris, and legally dispose of them off Owner's property.

**END OF SECTION 31 2000**

# SECTION 32 1216 - ASPHALT PAVING

## PART 1 - GENERAL

### 1.01 RELATED DOCUMENTS

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

### 1.02 SUMMARY

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

B. Related Requirements:
   1. Section 31 1000 "Site Clearing" for demolition and removal of existing asphalt pavement.
   2. Section 31 2000 "Earth Moving" for subgrade preparation, fill material, separation geotextiles, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.
   3. Section 32 1373 "Concrete Paving Joint Sealants" for joint sealants and fillers at pavement terminations.

### 1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include technical data and tested physical and performance properties.
   2. Job-Mix Designs: Certification, 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:
   1. GeoGrid

### 1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and testing agency.

B. Material Certificates: For each paving material.

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

D. Field quality-control reports.

### 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by MDOT.

B. Testing Agency Qualifications: Qualified according to ASTM D3666 for testing indicated.

C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of MDOT for asphalt paving work.
   1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

### 1.06 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. Tack Coat: Minimum surface temperature of 60 deg F.
   2. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
   3. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

## PART 2 - PRODUCTS

### 2.01 AGGREGATES

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

B. Coarse Aggregate: ASTM D692/D692M, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.

C. Fine Aggregate: ASTM D1073, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.

1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

D. Mineral Filler: ASTM D242/D242M, rock or slag dust, hydraulic cement, or other inert material.

### 2.02 ASPHALT MATERIALS

A. Asphalt Binder: ASTM D6373 binder designation PG 64-22.

B. Tack Coat: ASTM D977 emulsified asphalt, or ASTM D2397/D2397M cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

C. Water: Potable.

D. Undersealing Asphalt: ASTM D3141/D3141M; pumping consistency.

### 2.03 AUXILIARY MATERIALS

A. Recycled Materials for Hot-Mix Asphalt Mixes: Reclaimed asphalt pavement; reclaimed, unbound-aggregate base material.

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 D1073, 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 D6690, Type IV, hot-applied, single-component, polymer-modified bituminous sealant.

### 2.04 MIXES

A. Recycled Asphalt Content:

1. May be permitted in percentages in accordance with MDOT guidelines and specifications for use in the surface course mix design.

B. Hot-Mix Asphalt: Dense-graded, hot-laid, hot-mix asphalt plant mixes approved by MDOT and complying with the following requirements:

1. Leveling Course: MDOT 13A or MDOT 4EML
2. Surface Course: MDOT 13A or MDOT 4EML

### 2.05 GEOGRID

A. Between the Aggregate Base and Granular Base:

1. Tensar NX 750 or equivalent

B. Between the Granular Base and Compacted Subgrade:

1. Tensar NX 850 or equivalent

## PART 3 - EXECUTION

### 3.01 EXAMINATION

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

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

### 3.02 PREPARATION

A. Protection: Provide protective materials, procedures, and worker training to prevent asphalt materials from spilling, coating, or building up on curbs, driveway aprons, manholes, and other surfaces adjacent to the Work.

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.
   2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
   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.

**3.03 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 as indicated on the drawings.
   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, driveway aprons, 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 after milling, before wearing course is laid.
   7. Handle milled asphalt material according to approved waste management plan required in Section 01 7419 "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.

**3.04 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 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. Undersealing: 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..
   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.

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

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

**3.05 REPAIRS**

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

B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth as indicated on the drawings.
   1. Clean cracks and joints in existing hot-mix asphalt pavement.
   2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch 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 wide. Fill flush with surface of existing pavement and remove excess.

**3.06 SURFACE PREPARATION**

A. 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.. 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. 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..
   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.

**3.07 GEOGRID INSTALLATION**

A. Place geogrid promptly according to manufacturer's written instructions. Overlap longitudinal and transverse joints per manufacturer’s recommendations.

B. Do not let geogrid be exposed to sunlight for more than 500 hours prior to burying.

**3.08 PLACING HOT-MIX ASPHALT**

A. Machine place hot-mix 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 hot-mix asphalt base course in number of lifts and thicknesses indicated.
   2. Place hot-mix asphalt surface course in single lift.
   3. Spread mix at a minimum temperature of 250 deg F.
   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 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 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 hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

**3.09 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 hot-mix asphalt course.
   1. Clean contact surfaces and apply tack coat to joints.
   2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
   3. Offset transverse joints, in successive courses, a minimum of 24 inches.
   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 hot-mix asphalt will bear roller weight without excessive displacement.
   6. Compact asphalt at joints to a density within 2 percent of specified course density.

**3.10 COMPACTION**

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix 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.

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 hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
   1. Average Density: 96 percent of reference laboratory density according to ASTM D6927 or AASHTO T 245, but not less than 94 percent or greater than 100 percent.
   2. Average Density: 92 percent of reference maximum theoretical density according to ASTM D2041/D2041M, but not less than 90 percent or greater than 96 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. 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.

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

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

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

**3.11 INSTALLATION TOLERANCES**

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
   1. Base and Leveling Course: Plus or minus 1/2 inch.
   2. Surface Course: Plus 1/4 inch, 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 straightedge applied transversely or longitudinally to paved areas:
   1. Base and Leveling 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.

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 of height indicated above pavement surface.

**3.12 SURFACE TREATMENTS**

A. Fog Seals: Apply fog seal at a rate of 0.10 to 0.15 gal./sq. yd. 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 D3910 and allow to cure.
   1. Roll slurry seal to remove ridges and provide a uniform, smooth surface.

**3.13 FIELD QUALITY CONTROL**

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D3549/D3549M.

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

D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D979/D979M 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 D2041/D2041M, and compacted according to job-mix specifications.
   2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D1188 or ASTM D2726/D2726M.
      a. One core sample will be taken for every 1000 sq. yd. 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 D2950 and correlated with ASTM D1188 or ASTM D2726/D2726M.

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

F. Remove and replace or install additional hot-mix 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 01 7419 "Construction Waste Management and Disposal."

**END OF SECTION 32 1216**

# SECTION 32 1313 - CONCRETE PAVING

## PART 1 - GENERAL

### 1.01 RELATED DOCUMENTS

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

### 1.02 SUMMARY

A. Section Includes:
   1. Concrete sidewalks and pavements.

B. Related Sections:
   1. Section 32 1373 "Concrete Paving Joint Sealants" for joint sealants in expansion and contraction joints within concrete paving and in joints between concrete paving and asphalt paving or adjacent construction.

### 1.03 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

### 1.04 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: As required in project documents.

C. Other Action Submittals:
   1. Design Mixtures: For each concrete paving and curb mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

### 1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified ready-mix concrete manufacturer.

B. Material Certificates: For the following, from manufacturer:
   1. Cementitious materials.
   2. Steel reinforcement and reinforcement accessories.
   3. Fiber reinforcement.
   4. Admixtures.
   5. Curing compounds.
   6. Applied finish materials.
   7. Bonding agent or epoxy adhesive.
   8. Joint fillers.

C. Shop Drawings: For layout and cutting of Detectable Warning Tiles at each sidewalk ramp.

D. Field quality-control reports.

### 1.06 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

B. ACI Publications: Comply with ACI 301unless otherwise indicated.

### 1.07 PROJECT CONDITIONS

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

## PART 2 - PRODUCTS

### 2.01 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

**2.02 STEEL REINFORCEMENT**

A. Recycled Content: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from galvanized-steel wire into flat sheets.

C. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.

D. Epoxy-Coated Welded Wire Reinforcement: ASTM A 884/A 884M, Class A, plain steel.

E. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

F. Galvanized Reinforcing Bars: ASTM A 767/A 767M, Class II zinc coated, hot-dip galvanized after fabrication and bending; with ASTM A 615/A 615M, Grade 60 deformed bars.

G. Epoxy-Coated Reinforcing Bars: ASTM A 775/A 775M or ASTM A 934/A 934M; with ASTM A 615/A 615M, Grade 60 deformed bars.

H. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60, deformed bars; assembled with clips.

I. Plain-Steel Wire: ASTM A 82/A 82M, galvanized.

J. Deformed-Steel Wire: ASTM A 496/A 496M.

K. Epoxy-Coated-Steel Wire: ASTM A 884/A 884M, Class A coated, deformed.

L. Dowel Placement System: Speed Dowel by Sika Greenstreak, or approved equal.

M. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 plain-steel bars; zinc coated (galvanized) after fabrication according to ASTM A 767/A 767M, Class I coating. Cut bars true to length with ends square and free of burrs.

N. Epoxy-Coated, Joint Dowel Bars: ASTM A 775/A 775M; with ASTM A 615/A 615M, Grade 60, plain-steel bars.

O. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.

P. Hook Bolts: ASTM A 307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

Q. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

R. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating, compatible with epoxy coating on reinforcement.

S. Zinc Repair Material: ASTM A 780.

**2.03 CONCRETE MATERIALS**

A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C 150, gray portland cement Type I/II. Mix designs may be supplemented with the following subject to Architect’s review and approval:
   a. Fly Ash: ASTM C 618, Class C or Class F.
   b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

2. Blended Hydraulic Cement: ASTM C 595, Type IP, portland-pozzolan cement.

B. Normal-Weight Aggregates: ASTM C 33, , uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.
1. Maximum Coarse-Aggregate Size: 1 inchnominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: Potable and complying with ASTM C 94/C 94M.

D. Air-Entraining Admixture: ASTM C 260.

E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.

**2.04 FIBER REINFORCEMENT**

A. Synthetic Fiber: Monofilament polypropylene fibers engineered and designed for use in concrete paving, complying with ASTM C 1116/C 1116M, Type III, 1/2 to 1-1/2 incheslong.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
a. Monofilament Fibers:
1) Axim Italcementi Group, Inc.; FIBRASOL II P.
2) Euclid Chemical Company (The), an RPM company; Fiberstrand 100, Fiberstrand 150.
3) Grace, W. R. & Co. - Conn.; Grace MicroFiber.
4) Metalcrete Industries; Polystrand 1000.
5) QC Construction Products; QC FIBERS.

**2.05 CURING MATERIALS**

A. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

**2.06 CONCRETE SEALER**

A. Apply a 100% silane or siloxane, penetrating concrete sealer per manufacturer’s recommendations. The concrete should be reasonably dry prior to the sealer application, to properly absorb the sealer. Ensure joints have been cleaned and sealed at the same time. Manufacturer products, or approved equal, include:
1. MasterProtect H 1000, 200 sf/gal, BASF.
2. Iso-Flex 618-100 RFS, 200 sf/gal, Lymtal.
3. Protectosil BHN, 200 sf/gal, Evonik Corp.
4. Sikagard 705:, 200 sf/gal, Sika.
5. Sil-Act ATS-100LV, 200 sf/gal, ACT.

**2.07 RELATED MATERIALS**

A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

**2.08 DETECTABLE WARNING MATERIALS**

A. Detectable Warning Tile: Cast-in-place ADA compliant truncated dome warning tiles as manufactured by Engineered Plastics, Inc., Williamsville NY, (800) 682-2525. Tiles shall be as follows:
1. Product: Armor-Tile Cast-in-Place System
2. Size: 24-inch x 24-inch, square
3. Color: Brick Red

**2.09 CONCRETE MIXTURES**

A. Prepare design mixtures, proportioned according to ACI 301 for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.
   1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
   2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that meet or exceed requirements.

B. Proportion mixtures to provide normal-weight concrete with the following properties:
   1. Compressive Strength (28 Days): 4000 psi
   2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.
   3. Slump Limit: 4 inches plus or minus 1 inch

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:
   1. Air Content: 6 percent plus or minus 1.0 percent for 1-inch nominal maximum aggregate size.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
   1. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

F. Cementitious Materials: Limit percentage by weight of cementitious materials other than portland cement according to ACI 301requirements as follows:
   1. Fly Ash or Pozzolan: 25 percent.
   2. Ground Granulated Blast-Furnace Slag: 50 percent.
   3. Combined Fly Ash or Pozzolan, and Ground Granulated Blast-Furnace Slag: 50 percent, with fly ash or pozzolan not exceeding 25 percent.

G. Synthetic Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd.

**2.10 CONCRETE MIXING**

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

**PART 3 - EXECUTION**

**3.01 EXAMINATION**

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Test subgrades and subbase for specified compaction.

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

**3.02 PREPARATION**

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

**3.03 EDGE FORMS AND SCREED CONSTRUCTION**

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

**3.04 STEEL REINFORCEMENT**

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Reinforcement shall be held in place by chairs, spacers, or other devices commercially manufactured specifically for that purpose. Bricks, blocks, rocks, or use of other construction debris will not be accepted. Hooking or pulling reinforcement into place will not be allowed.

E. Epoxy-Coated Reinforcement: Use epoxy-coated steel wire ties to fasten epoxy-coated reinforcement. Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M.

**3.05 JOINTS**

A. General: Form expansion, isolation, and control joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Expansion Joints: Set expansion joints at locations indicated on plans.

1. Locate expansion joints as indicated on the drawings.
2. Install dowel bars and support assemblies at joints where indicated. Use speed dowel assemblies to prevent concrete bonding to one side of joint.
3. Extend joint fillers full width and depth of joint.
4. Terminate joint filler at height indicated on plans to allow for installation of joint sealant.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Locate isolation joints as indicated on the drawings.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler at height indicated on plans to allow for installation of joint sealant.
4. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.

D. Control Joints: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/8-inchradius. Repeat grooving of control joints after applying surface finishes. Eliminate grooving-tool marks on concrete surfaces.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inchradius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

**3.06 CONCRETE PLACEMENT**

A. Before placing concrete, inspect and complete formwork installation and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301requirements for measuring, mixing, transporting, and placing concrete.
E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.
F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
G. Consolidate concrete according to ACI 301by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
   1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating joint devices.
H. Screed paving surface with a straightedge and strike off.
I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
J. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:
   1. When air temperature has fallen to or is expected to fall below 40 deg F uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg Fand not more than 80 deg Fat point of placement.
   2. Do not use frozen materials or materials containing ice or snow.
   3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.
K. Hot-Weather Placement: Comply with ACI 301and as follows when hot-weather conditions exist:
   1. Cool ingredients before mixing to maintain concrete temperature below 90 deg Fat time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
   2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
   3. Fog-spray forms and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

**3.07 FLOAT FINISHING**

A. General: Do not add water to concrete surfaces during finishing operations.
B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
   1. Medium-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

**3.08 DETECTABLE WARNING MATERIALS**

A. General: Installation shall conform to city standards, approved shop drawings, and manufacturer’s directions.
B. Cutting: Tiles shall be cut according to approved shop drawings prior to installation. Cuts shall be straight and free of burrs, notches, and other irregularities. Cuts for detectable warning tiles along curb radii shall result in uniform pie shape pieces with cuts on joining sides of every tile.
C. Installation: Cast tiles into concrete per manufacturer’s directions.

**3.09 CONCRETE PROTECTION AND CURING**

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft.before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by curing compound as follows:

1. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas that have been subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

**3.10 CONCRETE WASHOUT**

A. Do not discharge concrete washout into storm drains, catch basins or to the sanitary sewer system. Perform washing of concrete trucks in designated areas or an approved offsite location.

1. Designated areas should be clearly labeled. They should be in a pit to prevent run-off of waste water. Place designated areas a minimum of 50 feet from storm drains, bodies of water and ditches. All designated areas should be lined to prevent seepage and should have a barrier.
2. Alternative to a designated area: Provide a concrete box. If only a small amount of concrete washing is to occur, one option is to line a roll-off box. For very small projects this could be done with a drum.

B. Once concrete washout has hardened, break up and dispose of properly. Disposal of hardened concrete should occur on a regular basis.

C. Washout facilities must be cleaned, or new facilities provided once the washout area is 75% full.

**3.11 FIELD QUALITY CONTROL**

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each ready mix loador fraction thereof of each concrete mixture placed each day.
   a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg Fand below and when it is 80 deg Fand above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.

a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi

D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

G. Concrete paving will be considered defective if it does not pass tests and inspections.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

I. Prepare test and inspection reports.

**3.12 REPAIRS AND PROTECTION**

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

**3.13 WASTE MANAGEMENT**

A. Separate and recycle waste materials, packaging, and all other materials in accordance with the Waste Management Plan and to the maximum extent possible, send to reuse or recycle centers.

B. Concrete Washout:

1. Do not discharge concrete washout into storm drains, catch basins or to the sanitary sewer system. Perform washing of concrete trucks in designated areas or offsite.
    a. Designated areas should be clearly labeled. They should be in a pit to prevent run-off of waste water. Place designated areas a minimum of 50 feet from storm drains, bodies of water and ditches. All designated areas should be lined to prevent seepage and should have a barrier.
    b. Alternative to a designated area: Provide a concrete box. If only a small amount of concrete washing is to occur, one option is to line a roll-off box. For very small projects this could be done with a drum.
2. Once concrete washout has hardened, break up and dispose of properly. Disposal of hardened concrete should occur on a regular basis.

C. Washout facilities must be cleaned, or new facilities provided once the washout area is 75% full.

**END OF SECTION 32 1313**

# SECTION 32 1373 - CONCRETE PAVING JOINT SEALANTS

## PART 1 - GENERAL

### 1.01 SUMMARY

A. Section applies to areas outside building footprint and includes:
   1. Cold-applied joint sealants.
   2. Hot-applied joint sealants.

### 1.02 PRECONSTRUCTION TESTING

A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers samples of materials that will contact or affect joint sealants. Use ASTM C 1087 manufacturer's standard test method to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

### 1.03 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.
B. Samples: For each kind and color of joint sealant required.
C. Pavement-Joint-Sealant Schedule: Include the following information:
   1. Joint-sealant application, joint location, and designation.
   2. Joint-sealant manufacturer and product name.
   3. Joint-sealant formulation.
   4. Joint-sealant color.
D. Product certificates.
E. Product test reports.
F. Preconstruction compatibility and adhesion test reports.

### 1.04 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021.
B. Preinstallation Conference: Conduct conference at Project site.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

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

### 2.02 COLD-APPLIED JOINT SEALANTS

A. Multicomponent, Pourable, Traffic-Grade, Urethane Joint Sealant for Concrete: ASTM C 920, Type M, Grade P, Class 25, for Use T.

### 2.03 JOINT-SEALANT BACKER MATERIALS

A. Round Backer Rods for Cold-Applied Joint Sealants: ASTM D 5249, Type 3, of diameter and density required to control joint-sealant depth and prevent bottom-side adhesion of sealant.

### 2.04 PRIMERS

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

## PART 3 - EXECUTION

### 3.01 INSTALLATION

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
B. Cleaning of Joints: Clean out joints immediately before installing joint sealants.

C. Protection: Protect bluestone and other adjacent materials to prevent sealant spills, drips, strings, or other surface blemishes.

D. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

E. Install joint-sealant backings of kind indicated to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of joint-sealant backings.
   2. Do not stretch, twist, puncture, or tear joint-sealant backings.
   3. Remove absorbent joint-sealant backings that have become wet before sealant application and replace them with dry materials.

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

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

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

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

**END OF SECTION 32 1373**

# SECTION 32 3113 - CHAIN LINK FENCES AND GATES

## PART 1 - GENERAL

### 1.01 RELATED DOCUMENTS

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

### 1.02 SUMMARY

A. Section Includes:
   1. Relocation of existing chain-link fences.

### 1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
      a. Fence and gate posts, rails, and fittings.
      b. Chain-link fabric, reinforcements, and attachments.

### 1.04 FIELD CONDITIONS

A. Field Measurements: Verify layout information for gate relocations shown on Drawings in relation to existing and proposed site improvements. Verify dimensions by field measurements and confirm with Owner and Architect.

### 1.05 WARRANTY

A. Special Warranty: Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Failure to comply with performance requirements.
      b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
      c. Faulty operation of relocated gates.
   2. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.01 PERFORMANCE REQUIREMENTS

A. Structural Performance: Chain-link fence and gate frameworks shall withstand the design wind loads and stresses for fence height(s) and under exposure conditions indicated according to ASCE/SEI 7.

B. Post Size: Determine according to ASTM F1043 for existing post spacing and gate sizes, for Material Group IA, ASTM F1043, Schedule 40 steel pipe.
      a. Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified.

### 2.02 CHAIN-LINK FENCE FABRIC

A. General: Salvage and reuse existing fence fabric. If new fabric is required due to damage, provide to match existing.
   1. Fabric Height:
      a. Perimeter Fence, Softball Home Bull Pen: 72 inches.
      b. Gate: 72 inches.
   2. Steel Wire for Fabric: 9 gauge.
      a. Mesh Size: 2 inches.
      a. Polymer-Coated Fabric: ASTM F668, Class 2b over zinc-coated steel wire.
         1) Color: Black.
      b. Coat selvage ends of metallic-coated fabric before the weaving process with manufacturer's standard clear protective coating.
   3. Selvage: Knuckled at both selvages.

**2.03 FENCE FRAMEWORK**

A. Posts and Rails: ASTM F1043 for framework, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F1043 or ASTM F1083 based on the following:
   1. Fence Height:
      a. Perimeter Fence, 72 inches.
      b. Gate: 72 inches.
   2. Perimeter Fence Post Material: Light-Industrial-Strength Group IC-L, round steel pipe, electric-resistance-welded pipe.
      a. Line Post: 2 ½" (2.375) O.D.
      b. Corner Post: 3" (2.875) O.D.
   3. Horizontal Framework Members: Rails according to ASTM F1043.
      a. Top and Bottom Rail: 1 5/8" (1.625) O.D.
      b. Gate Frame: 2" (1.875) O.D.
   4. Polymer-Coated: ASTM F934, over zinc-coated frame.
      a. Color: Black.

**2.04 TENSION WIRE**

A. Polymer-Coated Steel Wire: 0.177-inch-diameter, tension wire according to ASTM F1664, Class 2b over zinc-coated steel wire.
   1. Color: Match chain-link fabric (Black), according to ASTM F934.

**2.05 SWING GATES**

A. General: ASTM F900 for gate posts and single swing gate types.
   1. Gate Leaf Width: As indicated.
   2. Framework Member Sizes and Strength: Based on gate fabric height as indicated.

B. Pipe and Tubing:
   1. Zinc-Coated Steel: ASTM F1043 and ASTM F1083; protective coating and finish to match fence framework.
   2. Gate Posts: Round tubular steel.
   3. Gate Frames and Bracing: Round tubular steel.

C. Frame Corner Construction: Welded.

D. Hardware:
   1. Hinges: 360-degree inward and outward swing.
   2. Latch: Permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
   3. Padlock and Chain: Provided by Owner.

**2.06 FITTINGS**

A. General: Match existing fence fittings where they cannot be salvaged and reused. This includes post caps, braces, rail fittings, tie wires, clips, etc.

**PART 3 - EXECUTION**

**3.01 EXAMINATION**

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.
   1. Do not begin installation before final grading is completed unless otherwise permitted by Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 PREPARATION**

A. Stake locations of fence lines, gates, and terminal posts. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

**3.03 CHAIN-LINK FENCE INSTALLATION**

A. Install chain-link fencing according to ASTM F567 and more stringent requirements specified.

B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated by Contractor's structural engineer, in firm, undisturbed soil.

C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
   1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
   2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
      a. Concealed Concrete: Place top of concrete 2 inches below grade to allow covering with surface material.

D. Tension Wire: Install according to ASTM F567, maintaining plumb position and alignment of fence posts. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch-diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install tension wire in locations indicated before stretching fabric. Provide horizontal tension wire at the following locations:
   1. Extended along bottom of fence fabric. Install bottom tension wire within 4 inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.

E. Top Rail: Install according to ASTM F567, maintaining plumb position and alignment of fence posts. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.

F. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 1-inch bottom clearance between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

G. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric according to ASTM F626. Bend ends of wire to minimize hazard to individuals and clothing.
   1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.

**3.04 GATE INSTALLATION**

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.

**3.05 ADJUSTING**

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

**END OF SECTION 32 3113**

# SECTION 32 9113 - SOIL PREPARATION

## PART 1 - GENERAL

### 1.01 RELATED DOCUMENTS

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

### 1.02 SUMMARY

A. Section includes planting soils for disturbed lawn areas.

B. Related Sections:

1. Division 32 Section 32 9200 ‘Turf and Grasses’ for topsoil/ seed bed preparation and seeding.

### 1.03 DEFINITIONS

A. Retain terms that remain after this Section has been edited for a project.

B. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.

C. Imported Soil: Soil that is transported to Project site for use.

D. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.

E. Topsoil: Imported soil; or manufactured soil that has been modified as specified with required soil amendments to produce a soil mixture best for turf growth.

F. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

G. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

H. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.

### 1.04 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Submit a certified analysis of topsoil from all sources from an independent testing laboratory prior to placement. Topsoil shall meet criteria set fourth within the paragraph 2.1 deficiencies shall be corrected prior to placement of topsoil.

## PART 2 - PRODUCTS

### 2.01 TOPSOIL

A. Planting-Soil for Lawns: Topsoil shall be imported, shred before spreading.

1. Imported topsoil shall meet the following criteria, be confirmed through test results and submitted to the Project Engineer. Imported topsoil shall be weed-free and free of extraneous material (stones, sticks, etc.) larger than ½”.
    a. pH range between 5.5 and 6.5
    b. Soluble salts content 500 ppm (parts per million) maximum
    c. Organic content between 5 and 30 percent
    d. Clay content between 5 and 25 percent

### 2.02 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:

1. Class: T, with a minimum of 99 percent passing through a sieve and a minimum of 75 percent passing through a sieve
2. Class: O, with a minimum of 95 percent passing through a sieve and a minimum of 55 percent passing through a sieve.
3. Form: Provide lime in form of ground dolomitic limestone.

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a sieve and a maximum of 10 percent passing through a sieve.
C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
D. Sand: Clean, washed, natural or manufactured, free of toxic materials and according to ASTM C 33/C 33M.

**PART 3 - EXECUTION**

**3.01 GENERAL**

A. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in subsoil or topsoil.

**3.02 PLACING TOPSOIL OVER DISTURBED LAWN AREAS**

A. Remove 4” of existing topsoil within disturbed lawn areas.
B. Subgrade Preparation: Till subgrade to a minimum depth of Remove stones larger than in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
C. Remove stones larger than in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner’s property.
D. Spreading topsoil for Lawns: Spread topsoil to a minimum total depth of 4” but not less than required to meet finish grades after mixing with amendments and natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.
E. Compaction: Compact each lift of planting soil to 85 percent of maximum Standard Proctor density according to ASTM D 698 and tested in-place.
F. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

**3.03 PROTECTION AND CLEANING**

A. Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform seeding operations:
    1. Storage of construction materials, debris, or excavated material.
    2. Parking vehicles or equipment.
    3. Vehicle traffic.
    4. Foot traffic.
    5. Erection of sheds or structures.
    6. Impoundment of water.
    7. Excavation or other digging unless otherwise indicated.
B. Remove surplus soils and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off Owner's property unless otherwise indicated.
    1. Dispose of excess existing subsoil, topsoil and unsuitable materials off site.

**END OF SECTION 32 9113**

# SECTION 32 9200 - TURF AND GRASSES

## PART 1 - GENERAL

### 1.01 RELATED DOCUMENTS

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

### 1.02 SUMMARY

A. Section Includes:
   1. Seed bed preparation, fertilization, seeding, sodding, mulching, maintenance and turf warranty.

B. Related Sections:
   1. Division 32 Section 32 9113 “Soil Preparation” for topsoil preparation and placement.

### 1.03 DEFINITIONS

A. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

B. Weeds: includes dandelion, jimsonweed, quackgrass, horsetail, morning glory, rush grass, mustard, lambsquarter, chickweek, cress, crabgrass, Canadian thistle, nutgrass, poison oak, blackberry, tansy ragwort, Bermuda grass, Johnson grass, poison ivy, nut sedge, nible will, bindweed, bent grass, wild garlic, perennial sorrel and brome grass.

C. Topsoil: Use imported topsoil. See Section 32 9113 “Soil Preparation” and drawing designations for topsoil and seeding.

### 1.04 REFERENCES

A. Michigan Department of Transportation (MDOT) – 2012 Standard Specification for Construction.

### 1.05 PREINSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site.

### 1.06 INFORMATIONAL SUBMITTALS

A. Certification of grass seed and sod.
   1. Certification of each seed mixture.

B. Product certificates and data.

C. Submit sample of mulch blanket.

### 1.07 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment.
   1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
   2. Pesticide Applicator: State licensed, commercial.

### 1.08 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

## PART 2 - PRODUCTS

### 2.01 SEED AND SOD

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.

B. Seed and Sod Species:
   1. Quality: Seed of grass species as listed below with not more than 0.5 percent weed seed:
   2. Supplier: Rhino Seed, 800.482.3130.
      a. Seed Blend: ‘School Lawn Mix’.
         1) Seeding Rate: 250 lbs./acre.

3. Supplier: Stantec, 574.586.2412.
    a. Seed Blend: 'Wooded Wetland Establishment'
        1) Seeding Rate: 37.13 lbs./acre.

**2.02 FERTILIZERS**

A. Recommended starter fertilizer for grass with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil as indicated within topsoil analysis, and shall contain a minimum of 4% phosphorus acid, 2% soluble potash and sufficient nitrogen to provide one pound of actual nitrogen per 1000 square feet of lawn area.

**2.03 MULCH BLANKET**

A. Mulch Blanket: Shall be DS150 Double Net Straw Blanket as manufactured by North American Green, 248.596.4300, 866.960.4300.

**2.04 PESTICIDES AND HERBICIDES**

A. General: Pesticides and herbicides may only be used with written permission from Owner.

**PART 3 - EXECUTION**

**3.01 TURF AREA PREPARATION**

A. General: Prepare planting area for soil placement and mix planting soil according to Section 32 9113 "Soil Preparation."

B. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

C. Before seeding, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

**3.02 PLANTING SEASON**

A. April 1st through May 31st or August 16th through October 10th unless otherwise noted on plans or directed by Engineer.

**3.03 FERTILIZING**

A. Apply fertilizer in accordance with manufacturer's instructions.

B. Apply after smooth raking of topsoil.

C. Do not apply fertilizer at same time or with same machine as will be used to apply seed.

D. Mix fertilizer thoroughly into upper two inches (2") of topsoil

**3.04 MECHANICAL SEEDING**

A. Sow seed with mechanical seeder.
    1. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
    2. Do not use wet seed or seed that is moldy or otherwise damaged.
    3. Do not seed immediately following rain, when ground is dry, or during windy periods.

B. Sow seed at a total rate of 250 lbs. per acre.

C. Rake seed lightly into top 1/8 inchof soil, roll lightly, and water with fine spray.

D. Within 24 hours of seeding, all areas shall be mulched using mulch blanket. Mulch blanket shall be spread evenly with extreme care so as to leave the seeded lawn surface with a minimal amount of damage. Stake mulch blanket per manufacturers instructions.

**3.05 SODDING**

A. Athletic Fields: If turf seeding can not be fully established prior to the specified substantial completion date, the contractor shall sod disturbed areas within the athletic play fields at no additional cost to Owner. Sod composition shall match the specified Athletic Field Repair seed mix.

**3.06 TURF MAINTENANCE**

A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

B. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings. Establishment period will require multiple mowings.

**3.07 SATISFACTORY TURF**

A. Prior to acceptance, turf installations shall meet the following criteria as determined by Landscape Architect:

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory. Maintenance shall include mowing of seeded lawn areas and watering.

**END OF SECTION 32 9200**

# SECTION 33 1100 - FACILITY WATER DISTRIBUTION PIPING

## PART 1 – GENERAL

### 1.01 RELATED DOCUMENTS

A. City of Dexter Engineering Standards

B. Latest revision of AWWA C600.

### 1.02 SUMMARY:

A. This Section includes water-distribution piping and related components outside the building for water service mains.

B. Utility-furnished products include water meters that will be furnished to the site, ready for installation.

### 1.03 PROJECT CONDITIONS

A. Interruption of Existing Water-Distribution Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water-distribution service according to requirements indicated. Notify Construction Manager no fewer than two days in advance of proposed interruption of service.

### 1.04 COORDINATION

A. Coordinate connection to water main with the City of Dexter.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

A. Water main shall be class 54 ductile iron pipe to conform with the City of Dexter Engineering Standards.

### 2.02 GATE VALVES

A. Per City of Dexter Engineering Standards.

### 2.03 WATER METERS

A. Water meters may be furnished and/or purchased from the City of Dexter.

### 2.04 FIRE HYDRANTS

A. Fire Hydrants: Per City of Dexter Engineering Standards. EJIW Model 5BR or an approved equal conforming to AWWA C-502.

## PART 3 - EXECUTION

### 3.01 EARTHWORK

A. Refer to Section 312000 "Earth Moving" for excavating, trenching, and backfilling.

### 3.02 PIPING INSTALLATION

A. General: Per City of Dexter Engineering Standards and standard details.

B. Water-Main Lead Connection: Arrange with the City of Dexter to be present for transfers of water main lead changes at the appropriate locations indicated on water main plan sheets.

C. Water-Main Connection: Tap water main according to requirements of the City of Dexter.

D. Bury piping with depth of cover over top at least 5.5 feet deep.

E. Install underground piping with restrained joints at horizontal and vertical changes, use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports per the City of Dexter standard details.

### 3.03 JOINT CONSTRUCTION

A. Per City of Dexter Engineering Standards.

### 3.04 VALVE INSTALLATION

A. Per City of Dexter Engineering Standards.

### 3.05 FIRE HYDRANT INSTALLATION

A. Per City of Dexter Engineering Standards.

**3.06 JACK AND BORE**

A. Per City of Dexter Engineering Standards. Water main jacking or boring shall extend a minimum of ten feet outside the edges of the pavement.

**3.07 CLEANING AND TESTING**

B. Clean, test, and disinfect water-distribution piping Per City of Dexter Engineering Standards.

**END OF SECTION 33 1100**

# SECTION 33 3100 - FACILITY SANITARY SEWERS

## PART 1 – GENERAL

### 1.01 RELATED DOCUMENTS

A. City of Dexter Engineering Standards

### 1.02 SUMMARY:

A. This Section includes water-distribution piping and related components outside the building for sanitary sewers.

### 1.03 PROJECT CONDITIONS

A. Interruption of Existing Sanitary Sewerage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary bypass pumping according to requirements indicated. Notify Construction Manager no fewer than two days in advance of proposed interruption of service.

### 1.04 COORDINATION

A. Coordinate connection to water main with the City of Dexter.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

A. Sanitary sewer pipe will conform to the following current American Society for Testing and Materials Specifications. Allowed materials for public sewer pipe are as follows:
   A. Reinforced Concrete Sewer Pipe, ASTM Designation: C76. Class IV minimum.
   B. Composite ABS plastic, PVC and Perlite concrete truss pipe material as manufactured by Metal Products Division of Armco Steel Corporation, or equal, will conform to the requirements of the latest revision of ASTM D-2680-74.
   C. PVC pipe and fittings will conform to requirements of the latest revision ASTM D-3034 (SDR 26). Deflection of pipes will be limited to a maximum of five (5) precent.

### 2.02 MANHOLES, FRAMES, AND COVERS

A. Per City of Dexter Engineering Standards and details sheets.

### 2.03 CLEAN OUTS

A. Per City of Dexter Engineering Standards and details sheets.

## PART 3 - EXECUTION

### 3.01 EARTHWORK

A. Refer to Section 312000 "Earth Moving" for excavating, trenching, and backfilling.

### 3.02 PIPING INSTALLATION

A. General: Per City of Dexter Engineering Standards and standard details.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.

C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.

D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. When installing pipe under streets or other obstructions that cannot be disturbed, use jack and bore installation method.

F. Install gravity-flow, nonpressure, drainage piping according to the City of Dexter Engineering Standards.

### 3.03 JOINT CONSTRUCTION

A. Per City of Dexter Engineering Standards.

**3.04 MANHOLE INSTALLATION**

A. Per City of Dexter Engineering Standards.

**3.05 CLEAN OUT INSTALLATION**

A. Per City of Dexter Engineering Standards.

**3.06 CONNECTIONS**

A. Connect non-pressure, gravity-flow drainage piping to building's sanitary building drains.

B. Make connections to existing piping and underground manholes per the City of Dexter Engineering Standards.

**3.07 FIELD QUALITY CONTROL**

A. All pipe furnished shall be subject to inspection per the City of Dexter Engineering Standards.

**3.08 CLEANING AND TESTING**

A. Clean, test, and disinfect water-distribution piping Per City of Dexter Engineering Standards.

**END OF SECTION 33 3100**

# SECTION 33 4200 - STORMWATER CONVEYANCE

## PART 1 – GENERAL

### 1.01 SUMMARY

A. Section Includes:
   1. Ductile-iron culvert pipe and fittings.
   2. PE pipe and fittings.
   3. PVC pipe and fittings.
   4. Concrete pipe and fittings.
   5. Non-pressure transition couplings.
   6. Expansion joints.
   7. Cleanouts.
   8. Encasement for piping.
   9. Manholes.
   10. Polymer-concrete, channel drainage systems.
   11. Catch basins.
   12. Stormwater inlets.
   13. Stormwater detention structures.
   14. Pipe outlets.

### 1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.
B. Shop Drawings:
   1. Manholes: Include plans, elevations, sections, details, frames, and covers.
   2. Catch basins and stormwater inlets. Include plans, elevations, sections, details, frames, covers, and grates.
   3. Stormwater Detention Structures: Include plans, elevations, sections, details, frames, covers, design calculations, and concrete design-mix reports.
C. Product Certificates: For each type of cast-iron soil pipe and fitting.
D. Field quality-control reports.

### 1.03 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

## PART 2 - PRODUCTS

### 2.01 CORRUGATED-PE PIPE AND FITTINGS

A. Corrugated-PE Drainage Pipe and Fittings NPS 3 to NPS 10: AASHTO M 252, Type S, with smooth waterway for coupling joints.
B. Corrugated-PE Pipe and Fittings NPS 12 to NPS 60: AASHTO M 294, Type S, with smooth waterway for coupling joints.
C. Corrugated-PE Silttight Couplings: PE sleeve with ASTM D1056, Type 2, Class A, Grade 2 gasket material that mates with pipe and fittings.
D. Corrugated-PE Soiltight Couplings: AASHTO M 294, corrugated, matching pipe and fittings.

### 2.02 PVC PIPE AND FITTINGS

A. NSF Marking: Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-drain" for plastic storm drain and "NSF-sewer" for plastic storm sewer piping.
B. PVC Corrugated Sewer Piping:
   1. Pipe: ASTM F949, PVC, corrugated pipe with bell-and-spigot ends for gasketed joints.
   2. Fittings: ASTM F949, PVC molded or fabricated, socket type.
   3. Gaskets: ASTM F477, elastomeric seals.

### 2.03 CONCRETE PIPE AND FITTINGS

A. Reinforced-Concrete Sewer Pipe and Fittings: ASTM C76.

1. Bell-and-spigot or tongue-and-groove ends and gasketed joints with ASTM C443, rubber gaskets
2. Class IV.

**2.04 NONPRESSURE TRANSITION COUPLINGS**

A. Comply with ASTM C1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:
1. For Concrete Pipes: ASTM C443, rubber.
2. For Cast-Iron Soil Pipes: ASTM C564, rubber.
3. For Fiberglass Pipes: ASTM F477, elastomeric seal or ASTM D5926, PVC.
4. For Plastic Pipes: ASTM F477, elastomeric seal or ASTM D5926, PVC.
5. For Dissimilar Pipes: ASTM D5926, PVC or other material compatible with pipe materials being joined.

C. Unshielded, Flexible Couplings:
1. Description: Elastomeric sleeve with stainless-steel shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.

D. Shielded, Flexible Couplings:
1. Description: ASTM C1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.

E. Ring-Type, Flexible Couplings:
1. Description: Elastomeric compression seal with dimensions to fit inside bell of larger pipe and for spigot of smaller pipe to fit inside ring.

**2.05 CLEANOUTS**

A. PVC Cleanouts:
1. Description: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

**2.06 MANHOLES**

A. Standard Precast Concrete Manholes:
1. Description: ASTM C478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Diameter: 48 inches minimum unless otherwise indicated.
3. Ballast: Increase thickness of precast concrete sections or add concrete to base section as required to prevent flotation.
4. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
5. Riser Sections: 4-inch minimum thickness, and lengths to provide depth indicated.
6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated, and top of cone of size that matches grade rings.
7. Joint Sealant: ASTM C990, bitumen or butyl rubber.
8. Resilient Pipe Connectors: ASTM C923, cast or fitted into manhole walls, for each pipe connection.
9. Steps: Individual FRP steps; FRP ladder; or ASTM A615/A615M, deformed, 1/2-inch steel reinforcing rods encased in ASTM D4101, PP, wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of manhole to finished grade is less than 60 inches.
10. Adjusting Rings: Interlocking HDPE rings with level or sloped edge in thickness and diameter matching manhole frame and cover, and of height required to adjust manhole

frame and cover to indicated elevation and slope. Include sealant recommended by ring manufacturer.

11. Grade Rings: Reinforced-concrete rings, 6- to 9-inch total thickness, to match diameter of manhole frame and cover, and height as required to adjust manhole frame and cover to indicated elevation and slope.

**2.07 CONCRETE**

A. General: Cast-in-place concrete in accordance with ACI 318, ACI 350, and the following:
   1. Cement: ASTM C150/C150M, Type II.
   2. Fine Aggregate: ASTM C33/C33M, sand.
   3. Coarse Aggregate: ASTM C33/C33M, crushed gravel.
   4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.
   1. Reinforcing Fabric: ASTM A1064/A1064M, steel, welded wire fabric, plain.
   2. Reinforcing Bars: ASTM A615/A615M, Grade 60 (420 MPa) deformed steel.

C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.
   1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
      a. Invert Slope: [**1**] [**2**] percent through manhole.
   2. Benches: Concrete, sloped to drain into channel.
      a. Slope: [**4**] [**8**] percent.

D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.
   1. Reinforcing Fabric: ASTM A1064/A1064M, steel, welded wire fabric, plain.
   2. Reinforcing Bars: ASTM A615/A615M, Grade 60 (420 MPa) deformed steel.

**2.08 CATCH BASINS**

A. Standard Precast Concrete Catch Basins:
   1. Description: ASTM C478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
   2. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
   3. Riser Sections: 4-inch minimum thickness, 48-inch diameter, and lengths to provide depth indicated.
   4. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
   5. Joint Sealant: ASTM C990, bitumen or butyl rubber.
   6. Adjusting Rings: Interlocking rings with level or sloped edge in thickness and shape matching catch basin frame and grate. Include sealant recommended by ring manufacturer.
   7. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch-diameter frame and grate.
   8. Steps: Individual FRP steps; FRP ladder; or ASTM A615/A615M, deformed, 1/2-inch steel reinforcing rods encased in ASTM D4101, PP, wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of catch basin to finished grade is less than 60inches.

9. Pipe Connectors: ASTM C923, resilient, of size required, for each pipe connecting to base section.

B. Frames and Grates: ASTM A536, Grade 60-40-18, ductile iron designed for A-16 (AASHTO HS20-44), structural loading. Include flat grate with small square or short-slotted drainage openings.
1. Size: 24 by 24 inches minimum unless otherwise indicated.
2. Grate Free Area: Approximately 50 percent unless otherwise indicated.

C. Frames and Grates
1. Pavement edge or gutter line: EJ Group 5080 or as indicated on the plans.
2. Paved areas other than edge gutter line: EJ Group 1040 Type M or as indicated on the plans.
3. Yard areas: EJ Group 1040 Type N or as indicated on the plans.

**2.09 STORMWATER INLETS**

A. Curb Inlets: Made with vertical curb opening, of materials and dimensions in accordance with utility standards.

B. Gutter Inlets: Made with horizontal gutter opening, of materials and dimensions in accordance with utility standards. Include heavy-duty frames and grates.

C. Combination Inlets: Made with vertical curb and horizontal gutter openings, of materials and dimensions in accordance with utility standards. Include heavy-duty frames and grates.

D. Frames and Grates
1. Pavement edge or gutter line: EJ Group 5080 or as indicated on the plans.
2. Paved areas other than edge gutter line: EJ Group 1040 Type M or as indicated on the plans.
3. Yard areas: EJ Group 1040 Type N or as indicated on the plans.

**PART 3 - EXECUTION**

**3.01 EARTHWORK**

A. Excavation, trenching, and backfilling are specified in Section 312000 "Earth Moving."

**3.02 PIPING INSTALLATION**

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings in accordance with manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.

D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.

F. Install gravity-flow, nonpressure drainage piping in accordance with the following:
1. Install piping pitched down in direction of flow.
2. Install piping NPS 6 and larger with restrained joints at tee fittings and at changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place concrete supports or anchors.
3. Install piping with 36-inch-minimum cover.
4. Install hub-and-spigot, cast-iron soil piping in accordance with CISPI's "Cast Iron Soil Pipe and Fittings Handbook."

5. Install hubless cast-iron soil piping in accordance with CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook."
6. Install ductile-iron piping and special fittings in accordance with AWWA C600 or AWWA M41.
7. Install PE corrugated sewer piping in accordance with ASTM D2321.
8. Install PVC sewer piping in accordance with ASTM D2321 and ASTM F1668.
9. Install nonreinforced-concrete sewer piping in accordance with ASTM C1479 and ACPA's "Concrete Pipe Installation Manual."
10. Install reinforced-concrete sewer piping in accordance with ASTM C1479 and ACPA's "Concrete Pipe Installation Manual."

G. Install corrosion-protection piping encasement over the following underground metal piping in accordance with ASTM A674 or AWWA C105/A21.5:
1. Hub-and-spigot, cast-iron soil pipe and fittings.
2. Hubless cast-iron soil pipe and fittings.
3. Ductile-iron pipe and fittings.
4. Expansion joints.

**3.03 PIPE JOINT CONSTRUCTION**

A. Join gravity-flow, nonpressure drainage piping in accordance with the following:
1. Join hub-and-spigot, cast-iron soil piping with gasketed joints in accordance with CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
2. Join hub-and-spigot, cast-iron soil piping with caulked joints in accordance with CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead and oakum caulked joints.
3. Join hubless cast-iron soil piping in accordance with CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-coupling joints.
4. Join ductile-iron culvert piping in accordance with AWWA C600 for push-on joints.
5. Join ductile-iron piping and special fittings in accordance with AWWA C600 or AWWA M41.
6. Join corrugated-PE piping in accordance with ASTM D3212 for push-on joints.
7. Join PVC corrugated sewer piping in accordance with ASTM D2321 for elastomeric-seal joints.
8. Join nonreinforced-concrete sewer piping in accordance with ASTM C14 and ACPA's "Concrete Pipe Installation Manual" for rubber-gasketed joints.
9. Join reinforced-concrete sewer piping in accordance with ACPA's "Concrete Pipe Installation Manual" for rubber-gasketed joints.
10. Join dissimilar pipe materials with nonpressure-type flexible couplings.

B. Join force-main pressure piping in accordance with the following:
1. Join PVC pressure piping in accordance with AWWA M23 for gasketed joints.
2. Join dissimilar pipe materials with pressure-type couplings.

**3.04 CLEANOUT INSTALLATION**

A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
1. Use Light-Duty, top-loading classification cleanouts in earth or unpaved foot-traffic areas.
2. Use Medium-Duty, top-loading classification cleanouts in paved foot-traffic areas.
3. Use Heavy-Duty, top-loading classification cleanouts in vehicle-traffic service areas.
4. Use Extra-Heavy-Duty, top-loading classification cleanouts in roads.

B. Set cleanout frames and covers in earth in cast-in-place concrete block, 18 by 18 by 12 inches deep. Set with tops 1 inch(es above surrounding earth grade.

C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

**3.05 MANHOLE INSTALLATION**

A. General: Install manholes, complete with appurtenances and accessories indicated.
B. Install precast concrete manhole sections with sealants in accordance with ASTM C891.
C. Where specific manhole construction is not indicated, follow manhole manufacturer's written instructions.
D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 1 inch above finished surface elsewhere unless otherwise indicated.

**3.06 CATCH BASIN INSTALLATION**

A. Construct catch basins to sizes and shapes indicated.
B. Set frames and grates to elevations indicated.

**3.07 STORMWATER INLET INSTALLATION**

A. Construct inlet head walls, aprons, and sides of reinforced concrete, as indicated.
B. Construct riprap of broken stone, as indicated.
C. Install outlets that spill onto grade, anchored with concrete, where indicated.
D. Install outlets that spill onto grade, with flared end sections that match pipe, where indicated.
E. Construct energy dissipaters at outlets, as indicated.

**3.08 CONCRETE PLACEMENT**

A. Place cast-in-place concrete in accordance with ACI 318.

**3.09 CHANNEL DRAINAGE SYSTEM INSTALLATION**

A. Install with top surfaces of components, except piping, flush with finished surface.
B. Assemble channel sections to form slope down toward drain outlets. Use sealants, adhesives, fasteners, and other materials recommended by system manufacturer.
C. Embed channel sections and drainage specialties in 4-inch-minimum concrete around bottom and sides.
D. Fasten grates to channel sections if indicated.
E. Assemble channel sections with flanged or interlocking joints.
F. Embed channel sections in 4-inch-minimum concrete around bottom and sides.

**3.10 CONNECTIONS**

A. Connect nonpressure, gravity-flow drainage piping in building's storm building drains specified in Section 221413 "Facility Storm Drainage Piping."
B. Connect force-main piping to building's storm drainage force mains specified in Section 221413 "Facility Storm Drainage Piping." Terminate piping where indicated.
C. Make connections to existing piping and underground manholes.
    1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
    2. Make branch connections from side into existing piping, NPS 4 to NPS 20. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
    3. Make branch connections from side into existing piping, NPS 21 or larger, or to underground manholes and structures by cutting into existing unit and creating an opening large enough to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall unless otherwise indicated. On outside of pipe, manhole, or structure wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.
        a. Use concrete that will attain a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.

b. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.

4. Protect existing piping, manholes, and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

D. Connect to sediment interceptors specified in Section 221323 "Sanitary Waste Interceptors."

E. Pipe couplings, expansion joints, and deflection fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

1. Use nonpressure-type flexible couplings where required to join gravity-flow, nonpressure sewer piping unless otherwise indicated.
   a. Unshielded or Shielded flexible couplings for same or minor difference OD pipes.
   b. Unshielded, increaser/reducer-pattern, flexible couplings for pipes with different OD.
   c. Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.

## 3.11 CLOSING ABANDONED STORM DRAINAGE SYSTEMS

A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:

1. Close open ends of piping with at least 8-inch-thick, brick masonry bulkheads.
2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.

B. Abandoned Manholes and Structures: Excavate around manholes and structures as required and use one procedure below:

1. Remove manhole or structure and close open ends of remaining piping.
2. Remove top of manhole or structure down to at least 36 inches below final grade. Fill to within 12 inches of top with stone, rubble, gravel, or compacted dirt. Fill to top with concrete.

C. Backfill to grade in accordance with Section 312000 "Earth Moving."

## 3.12 IDENTIFICATION

A. Materials and their installation are specified in Section 312000 "Earth Moving." Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.

1. Use warning tape or detectable warning tape over ferrous piping.
2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

## 3.13 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate reports for each system inspection.
2. Defects requiring correction include the following:
   a. Alignment: Less than full diameter of inside of pipe is visible between structures.
   b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
   c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
   d. Infiltration: Water leakage into piping.
   e. Exfiltration: Water leakage from or around piping.
3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
   1. Do not enclose, cover, or put into service before inspection and approval.
   2. Test completed piping systems in accordance with requirements of authorities having jurisdiction.
   3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
   4. Submit separate report for each test.
   5. Gravity-Flow Storm Drainage Piping: Test in accordance with requirements of authorities having jurisdiction, UNI-B-6, and the following:
      a. Exception: Piping with soiltight joints unless required by authorities having jurisdiction.
      b. Option: Test plastic piping in accordance with ASTM F1417.

C. Leaks and loss in test pressure constitute defects that must be repaired.

D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

**3.14 CLEANING**

A. Clean interior of piping of dirt and superfluous materials. Flush with water.

**END OF SECTION 33 4200**

# APPENDIXES

# APPENDIX 1

Geotechnical Investigation

Dated December 29, 2025



REPORT ON GEOTECHNICAL INVESTIGATION

2025 DEXTER SCHOOLS BOND PROGRAM

# DHS FIELDHOUSE AND SITE IMPROVEMENTS AND AL RITT STADIUM LIGHTING

DEXTER, MICHIGAN 48130

LATITUDE 42.324878° N
LONGITUDE 83.89651° W

G2 CONSULTING GROUP

Prepared for:

Granger Construction
6267 Aurelius Road
Lansing, Michigan 48911

G2 Project No. 253566S
December 29, 2025

CONSULTING GROUP
Smart.Results.Fast.

December 29, 2025

Mr. Greg Brand, P.E.
Senior Project Manager
Granger Construction
6267 Aurelius Road
Lansing, Michigan 48911

**RE: Report on Geotechnical Investigation**
2025 Dexter Schools Bond Program
DHS Fieldhouse and Site Improvements and Al Ritt Stadium Lighting
Dexter, Michigan 48130
G2 Project No. 253566

Dear Mr. Brand:

We have completed the geotechnical investigation associated with the 2025 Dexter Schools Bond Program, which includes construction of the proposed fieldhouse athletic building and site improvements at Dexter High School, as well as the construction of stadium lighting at Al Ritt field. This report presents the results of our observations and analyses, as well as recommendations related to earthwork, subgrade preparation, foundation design, bituminous pavement design, in-situ infiltration, and related construction considerations.

We appreciate the opportunity to be of service to Granger Construction and look forward to discussing the recommendations presented. In the meantime, if you have any questions regarding the report or any other matter pertaining to the project, please call us.

Sincerely,

**G2 Consulting Group, LLC**

Ryan P. Carpus, P.E.
Project Engineer

Jennifer M. Casey, P.E.
Project Consultant

Tyler S. Hesse, P.E.
Project Manager

RPC/TSH/JMC/tsh

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# EXECUTIVE SUMMARY

We understand the proposed project consists of constructing a new fieldhouse, pavements, a detention pond, and two (2) underground stormwater management structures at Dexter High School and new lighting at Al Ritt Stadium.

Approximately 2 to 10 inches of topsoil or 12 to 24 inches of crushed limestone aggregate are generally present at the ground surface of the soil borings. Within soil borings B-21 and B-22, B-28, B-31, B-33, B-37, and B-38, stiff to very stiff cohesive fill soils and very loose to medium compact granular fill soils underlie the topsoil and extend to approximate depths ranging from 3 to 6 feet. In general, the native soils consist of alternating strata of very loose to compact granular and stiff to very hard cohesive soils, extending to the explored depths ranging from 10 to 35 feet below grade. Groundwater was encountered at approximate depths ranging from 5 to 20 feet below existing grade within borings B-21 through B-29, B-31, and B-36 through B-39. Upon completion of drilling operations, the groundwater level within these borings was measured at depths ranging from 6 to 29 feet below grade. No measurable groundwater was observed during or upon completion of drilling operations within borings B-30 or B-32 through B-35. The rise in the groundwater level above the encountered elevation within soil borings B-22, B-23, and B-31 may be indicative of an artesian condition.

The fill soils noted above do not appear to have been placed in an engineered manner and have organic matter contents ranging from 4.3 to 7.0 percent. Considering the existing ground surface elevations and the fieldhouse FFE, we anticipate the fill soils within the influence of the fieldhouse will be removed while adjusting site grades to achieve the design subgrade elevation. In addition, based on proposed pavement finished grades, we anticipate the existing fill soils will be removed during grading operations in the vicinity of soil borings B-28 and B-31. Some existing fill soil may remain beneath the proposed pavement section within the vicinity of soil boring B-33. The fill within soil boring B-33 does not contain any notable organic matter and is generally considered suitable for support of the pavement, following the successful completion of a proof-roll/proof-compaction evaluation.

We recommend the fieldhouse be supported by shallow conventional strip and/or spread footings designed to bear at a minimum depth of 3-1/2 feet below finished grades within the native loose to medium compact granular soils, very stiff to hard cohesive soils, or engineered fill. Foundations bearing within the above mentioned soils can be designed based on a net allowable bearing capacity of 2,500 psf. Recommended soil design parameters for drilled pier foundations for the light poles are provided in the FOUNDATION RECOMMENDATIONS section of this report. If the recommendations outlined in this report are adhered to, total and differential settlements for the completed structures should be within 1 inch and ½ inch, respectively. We expect settlements of these magnitudes are within tolerable limits for the type of structures proposed.

No significant groundwater accumulations are anticipated in construction excavations for the proposed fieldhouse, utilities, or stormwater BMPs. We anticipate any groundwater seepage or surface runoff can be controlled with a properly constructed system of sumps and pumps.

Caving and/or sloughing of the granular soils will occur during drilled shaft excavation operations. In addition, groundwater was encountered at depths ranging from 5 to 7 feet below existing grade. Therefore, the drilled pier contractor should come to the site prepared to use temporary steel casing to maintain a stable excavation and seal off groundwater. The contractor should also come to the site prepared to break-up and remove any cobbles encountered in the excavation and may need a rock auger to excavate through the very hard cohesive soils.

Do not consider this summary separate from the entire text of this report, with all the conclusions and qualifications mentioned herein. Details of our analysis and recommendations are discussed in the following sections and in the Appendix of this report.

## PROJECT DESCRIPTION

We understand the proposed project includes construction of a new fieldhouse with associated site improvements at Dexter High School (DHS) and new stadium lighting at the Al Ritt Stadium near Creekside Intermediate School. The site improvements at DHS will include the construction of bituminous concrete pavements, site concrete, utilities, and structural best management practices (BMPs) consisting of a detention pond and two (2) underground stormwater management structures.

We understand the fieldhouse will be constructed to the south of the existing twin turf fields located within the southwest quadrant of the DHS campus. The fieldhouse will be a single-story, slab-on-grade structure with a height of 61 feet, an approximate footprint of 63,072 square feet, and a finished floor elevation (FFE) of 887-1/2 feet. The northern portion of the structure will include an interior mezzanine. Information regarding structural loading conditions associated with the fieldhouse was unavailable at the time of this report. It is assumed that the structure will have column loads ranging from 75 to 150 kips and wall loads ranging from 3 to 5 kips per foot.

Based on the topographic survey provided, existing site grades within the vicinity of the fieldhouse range from elevation 882 to 894 feet. As the fieldhouse will have a FFE of 887-1/2 feet, we anticipate existing grades will be lowered by as much as 6-1/2 feet and raised by as much as 5-1/2 feet to achieve the design subgrade elevation.

We understand that a bituminous concrete service drive and parking areas will be constructed around the perimeter of the fieldhouse. Information regarding anticipated traffic frequencies throughout the pavement areas was unavailable at the time of this report; however, we understand a heavy-duty pavement is proposed. Based on the provided Dexter High School Field House Schematic Design Grading Plan dated October 2025, Sheet C402, pavement grades west of the fieldhouse will be approximately 6 to 8 feet lower than existing grades, pavement grades east of the fieldhouse will be approximately 12 feet higher or 7 feet lower than existing grades, and pavement grades along the service drive leading to the parking areas will be similar to existing grade at the east and west ends of the drive and will be as much as 7 feet lower than existing grades along the remainder of the alignment.

Based on the drawings provided, we understand that four (4) new stadium light poles will be constructed along the perimeter of the Al Ritt Stadium football field. The light poles will have heights of 80 to 90 feet above grade. The loading conditions for the stadium lighting poles were not available to us at the time of this report; however, we assume the poles will be supported using drilled shaft foundations. Based on the "Electrical New Work Site Plan" drawing by Peter Basso Associates, dated October 31, 2025, we understand electrical conduit will be installed via directional drilling methods beneath the athletic field at a minimum depth of 10 feet below current grades.

G2 Consulting Group, LLC (G2) was provided a Geotechnical Report prepared by Driesenga & Associates, Inc. (D&A) Project No. 2520656.3A, dated August 12, 2025. The D&A report was completed during the preliminary design stage for the project. D&A soil borings SB-1, SB-2, and SB-3 lie within the vicinity of the proposed fieldhouse. These boring logs are included in the Appendix of this report are have been used in development of the recommendations contained herein.

If information related to existing/final site grades, structural loading conditions, finished floor elevation, and/or anticipated traffic frequencies change or become available, G2 should be notified to re-evaluate the recommendations provided herein, if necessary. The purpose of our exploration is to determine and evaluate the general subsurface conditions at the above-mentioned locations and to develop recommendations for earthwork, subgrade preparation, foundation design, bituminous pavement design, and in-situ infiltration, as well as construction considerations as they relate to the geotechnical conditions on site.

## SCOPE OF SERVICES

The field operations, laboratory testing, and engineering report preparation were performed under direction and supervision of a licensed professional engineer. Our services were performed according to generally accepted standards and procedures in the practice of geotechnical engineering in this area. Our scope of services for this project is as follows:

1. We performed a total of nineteen (19) soil borings throughout the above mentioned areas. Soil borings B-21 through B-26 per performed within the influence of the proposed fieldhouse extending to a depth of 25 feet each. Soil borings B-27 through B-35 were performed within the vicinity of the proposed pavement areas, detention pond, and underground stormwater management system, extending to depths ranging from 10 to 20 feet. Soil borings B-36 through B-39 were performed within the vicinity of the stadium light poles extending to depths ranging from 30 to 35 feet.

2. We performed laboratory testing on representative samples obtained from the soil borings. Laboratory testing included visual engineering classification, natural moisture content, organic matter content, Atterberg limits, and unconfined compressive strength determinations.

3. We prepared this engineering report. The report includes recommendations regarding earthwork, subgrade preparation, foundation design, bituminous pavement design, in-situ infiltration, and related construction considerations.

## FIELD OPERATIONS

G2, in conjunction with Granger Construction, selected the number, depths, and locations of the soil borings. The boring locations were determined in the field by a G2 representative using GPS assisted mobile technology and by measuring from known surface features using conventional taping methods. The approximate soil boring locations are shown on the Soil Boring Location Plans, Plate Nos. 1 and 2. A topographic survey detailing existing surface grades at the soil boring locations associated with the DHS fieldhouse and parking lot, titled "Topographic Survey" by Arbor Land Consultants and dated October 30, 2025, was used to interpolate ground surface elevations at the boring locations. If more precise ground surface elevations are required, we recommend the as-drilled ground surface elevations at the boring locations be determined using traditional survey techniques.

Prior to soil borings operations, we subcontracted a tree clearing company to provide access pathways to the soil boring locations within the wooded areas located near the southwest corner of the DHS campus. The soil borings were performed using an all-terrain vehicle (ATV) mounted drilling rig. Continuous 2-1/4-inch, inside-diameter, hollow-stem augers were used to extend the boreholes to the explored depths. Soil samples were collected at 2-1/2-foot intervals within the upper 10-feet and at 5-foot intervals thereafter. The samples were obtained using the Standard Penetration Test (SPT) method (ASTM D1586), which involves driving a 2-inch diameter split-spoon sampler into the soil with a 140-pound weight falling 30-inches. The sampler is generally driven in three (3) successive 6-inch increments with the number of blows for each increment recorded. The number of blows required to advance the sampler the last 12-inches is termed the Standard Penetration Resistance (N). The blow counts for each 6-inch increment and the resulting N-value are presented on the soil boring logs.

The soil samples were placed in sealed containers and brought to our laboratory for testing and classification. During field operations, the driller maintained logs of the subsurface conditions, including changes in stratigraphy and observed groundwater levels. The final boring logs are based on the field boring logs supplemented by laboratory soil classification and test results. The boreholes were backfilled with auger upon completion of drilling operations.

# LABORATORY TESTING

Representative soil samples were subjected to laboratory testing to determine soil parameters pertinent to subgrade preparation and foundation design. An experienced geotechnical engineer classified the samples in general conformance with the Unified Soil Classification System. Laboratory testing was conducted in conformance with the following ASTM Test Methods:

- "Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass" (ASTM D2216);
- "Standard Test Methods for Determining the Water (Moisture) Content, Ash Content, and Organic Material of Peat and Other Organic Soils" (ASTM D2974); and
- "Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils" (ASTM D4318).

The unconfined compressive strengths were determined using a spring-loaded hand penetrometer. The hand penetrometer estimates the unconfined compressive strength to a maximum of 4-1/2 tons per square foot (tsf) by measuring the resistance of the soil sample to the penetration of a spring-loaded cylinder.

The results of the moisture contents, organic matter contents, and unconfined compressive strengths are indicated on the Soil Boring Logs, Figure Nos. 21 through 39, at the depths the samples were obtained. The results of the Atterberg Limits tests are presented graphically in the appendix as Figure No. 40.

We will hold the soil samples for 60 days from the date of this report, at which time they will be discarded. If you would like the samples, please let us know prior to this date.

# SITE DESCRIPTION

## Dexter High School

The Dexter High School campus is located at 2200 N. Parker Road in Dexter, Michigan. The existing school can be accessed via two access drives leading eastward into the parcel and via an access drive extending southward from Shield Road. The existing site grades are highest near the intersection of Shield and N. Parker Road and gently slope downward as you approach the existing school. The site grades immediately surrounding the existing building are at higher elevations at the northwest end of the building near the entrance of the school and lower toward to the southeast end of the building.

The existing school building is a single to four-story structure with one-story partially below grade at the north end. The campus also includes several soccer fields, two (2) baseball diamonds, ten (10) tennis courts, and a detention pond, as well as associated bituminous concrete service drives and parking areas, and Portland cement concrete (PCC) sidewalks. The remainder of the campus is covered in manicured lawn, includes several mature trees, and isolated areas of dense vegetation.

Existing surface grades throughout the campus range from Elevation 856 to 894 feet. Site grades near the proposed fieldhouse and adjacent parking lots range from Elevation 882 to 894 feet, generally sloping down from north to south or northwest to southeast. Site grades along the proposed service drive generally range from Elevation 893 to 865 feet, generally sloping down in an easterly direction.

Based on historical aerial imagery, the parcel appears to have been used for agricultural purposes prior to construction of the Dexter High School Campus leading up to 1998. Sometime between 1998 and 2005, the Dexter

High School building and northern athletic facilities were constructed. We observe the southwestern wooded area was cleared and twin turf fields were constructed sometime around 2020. We observed crack sealing has been performed throughout the bituminous concrete areas since the original construction of the campus.



*Historical Aerial Imagery (1998)*



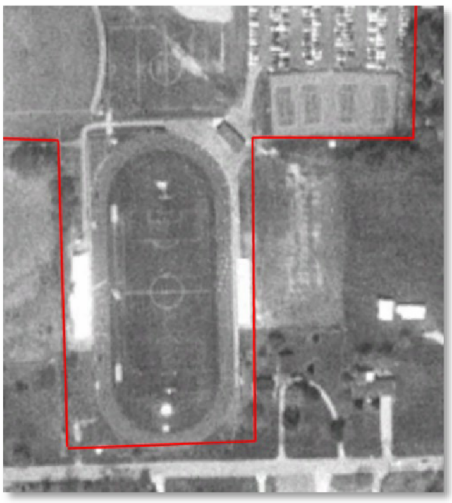
*Historical Aerial Imagery (2005)*



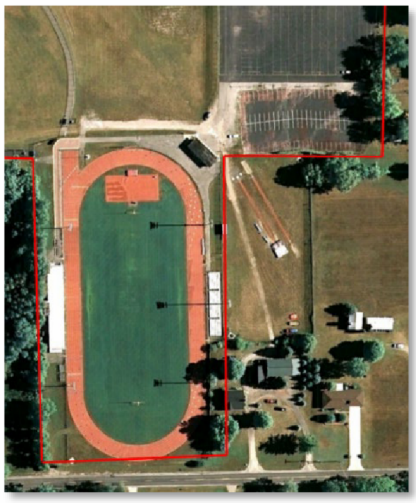
*Aerial Imagery (2025)*

## Al Ritt Stadium

The Al Ritt Stadium is located at 2615 Baker Road in Dexter, Michigan. The stadium is located south of Creekside Intermediate School. The site appears to be relatively flat, sloping down slightly from east to west. The existing football field, running track, bleacher structures, and maintenance building appear to have been constructed sometime prior to 1993. Then, sometime around 2007, the athletic fields north of the football field were demolished and replaced with bituminous concrete parking areas. It appears that the restroom/concessions building located on the north side of the stadium was constructed sometime between 2007 and 2013.



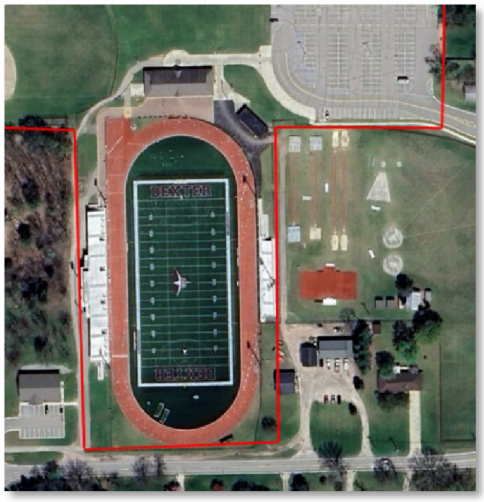
*Historical Aerial Imagery (1993)*



*Historical Aerial Imagery (2007)*




*Historical Aerial Imagery (2013)*



*Aerial Imagery (2025)*

# SOIL CONDITIONS

## DHS Fieldhouse Addition (B-21 through B-26 and D&A SB-1, SB-2, and SB-3)

Approximately 3 to 10 inches of topsoil is present at the ground surface of the soil borings. Within soil borings B-21 and B-22, clayey sand and silty clay fill soils underlie the topsoil and extend to an approximate depth of 3-1/2 feet. Alternating layers of native granular and cohesive soils consisting of sand, gravelly sand, silty sand, sandy silt, silty clay, sandy clay, and clayey silt, underlie the topsoil and fill soils and extend to the explored depth of 25 feet below existing grade.

The clayey sand fill is very loose in relative density with an SPT-N value of 2 blows per foot (bpf). The silty clay fill is very stiff in consistency with a moisture content of 19 percent and an unconfined compressive strength of 5,000 pounds per square foot (psf). The native cohesive soils within boring B-21 between 3-1/2 and 8-1/2 feet, within boring B-22 between 13-1/2 and 19-1/2 feet, within boring B-24 between 6 and 13-1/2 feet, and within B-25 between 18-1/2 and 24 feet are stiff in consistency with natural moisture contents between 10 and 21 percent and

unconfined compressive strength ranging from 2,000 to 3,000 psf. The remainder of the native cohesive soils are generally very stiff to hard in consistency with natural moisture contents ranging from 9 to 19 percent and unconfined compressive strength ranging from 4,000 to 9,000 psf. The native sandy clay present below elevations ranging from 867 to 858 feet within soil borings B-24 through B-26 is hard to very hard in consistency with natural moisture contents ranging from 8 to 10 percent, unconfined compressive strengths in excess of 9,000 psf, and SPT N-values ranging from 50 blows for 5 inches of penetration to 50 blows for 1 inch of penetration. The native granular soils are generally loose to medium compact in relative density with SPT N-values ranging from 6 to 27 bpf; however, isolated layers within soil boring B-23 between 23-1/2 and 25 feet and within boring B-25 between 14 and 18-1/2 feet are very loose in relative density with SPT N-values ranging from 3 to 4 bpf.

## DHS Fieldhouse Parking, Drive, and Structural BMPs (B-27 through B-35)

Approximately 2 to 7 inches of topsoil is present at the ground surface of borings B-27 through B-35. Within borings B-28, B-31, and B-32, granular and cohesive fill soils consisting of silty clay, sandy clay, and clayey sand underlie the topsoil and extend to approximate depths ranging from 3 and 6 feet. Notably, the silty clay fill within B-28 has an elevated organic matter content. Native granular soils, consisting of silty sand, clayey sand, and sandy silt, are present beneath the fill soils or topsoil within soil borings B-27, B-30, B-31, and B-35 and extend to depths ranging from 3 to 6 feet. Native cohesive soils, consisting of silty clay and sandy clay, generally underlie the upper granular soils and fill soils or topsoil within the remaining borings and extend to depths ranging from 3 feet to the explored depth of 20 feet. Granular soils consisting of clayey sand, sand, gravelly sand, and sandy gravel are present beneath the cohesive soils within soil borings B-27, B-29 through B-31, and B-33 and extend to the explored depth of 10 and 20 feet.

The clayey sand fill is medium compact in relative density with an SPT N-value of 15 bpf. The cohesive fill soils are stiff to very stiff in consistency with moisture contents ranging from 15 to 28 percent and unconfined compressive strengths ranging from 2,000 to 6,000 psf. Within B-28, the silty clay fill has organic matter contents ranging from 4 to 7 percent. The native cohesive soils within B-27 through B-35 are generally stiff to very stiff in consistency with natural moisture contents ranging from 10 to 19 percent and unconfined compressive strengths ranging from 2,500 to 7,000 psf; however, within B-35, the sandy clay between 3-1/2 and 6 feet is medium in consistency with a natural moisture content of 12 percent and an unconfined compressive strength of 1,500 psf. Within B-32, the silty clay has a liquid limit of 21 percent and a plasticity index of 6 percent. The native granular soils are generally loose to medium compact in relative density to approximate depths of 3 to 8-1/2 feet with SPT N-values ranging from 5 to 24 bpf. The native granular soil present below these depths are generally medium compact to compact with N-values ranging from 15 to 41 bpf.

## Al Ritt Stadium Lighting (B-36 through B-39)

Approximately 1 to 2 feet of crushed limestone aggregate is present at the ground surface of borings B-36 and B-37. Approximately 7 inches of topsoil is present at the ground surface of boring B-38. Within boring B-37 and B-38, granular fill soils consisting of silty sand and sand underlie the aggregate or topsoil and extend to approximate depths ranging from 4-3/4 to 6 feet. In general, native granular soils consisting of silty sand and sand are present beneath the fill soils or from the ground surface and extend to depths ranging from 8-1/2 to 13-1/2 feet. Silty clay and sandy clay underlie the fill soils within soil boring B-38 the native granular soils and generally extend to the explored depths ranging from 30 to 35 feet. A layer of gravelly sand is present below an approximate depth of 34-1/2 feet within soil boring B-39.

The silty sand fill is loose to medium compact in relative density with and SPT N-value ranging from 5 to 17 bpf. The native granular soils are very loose to loose in relative density within soil boring B-37 with SPT N-values ranging from 3 to 10 bpf. Elsewhere, the native granular soils are generally loose to medium compact in relative density

with N-values ranging from 6 to 23 bpf. However, the deeper native gravelly sand within boring B-39 is very compact in relative density with an SPT N-value in excess of 50 bpf. The native sandy clay present between the approximate depths of 8-1/2 and 13 feet within soil boring B-39 is very stiff in consistency with a natural moisture content of 13 percent and an unconfined compressive strength of 4,000 psf. Elsewhere, the native cohesive soils are hard to very hard in consistency with natural moisture contents ranging from 7 to 11 percent, unconfined compressive strengths of 9,000 psf or greater, and N-values ranging from 29 bpf to 50 blows for 2 inches of penetration.

### General

Although no environmental sampling protocol was used for the drilling operations, a hydrocarbon odor was noted in the native sandy clay within soil borings B-25 and B-33 between the approximate depths of 3 and 6 feet, which indicates the presence of possible subsurface contamination.

The stratification depths shown on the soil boring logs represent the soil conditions at the boring locations. Variations may occur between and away from the boring locations. Additionally, the stratigraphic lines represent the approximate boundaries between soil types. The transition may be more gradual than indicated. We have prepared the boring logs on the basis of the field log of the soil conditions encountered supplemented by laboratory classification and testing.

The Soil Boring Location Plans, Plate Nos, 1 and 2, and Soil Boring Logs, Figure Nos. 21 through 39, are presented in the Appendix. The soil profiles described above are generalized descriptions of the conditions encountered at the boring locations. General Notes Terminology defining the nomenclature used on the soil boring logs and elsewhere in this report are presented on Figure No. 41.

## GROUNDWATER CONDITIONS

### DHS Fieldhouse Addition (B-21 through B-26 and D&A SB-1, SB-2, and SB-3)

During drilling operations, groundwater was encountered at approximate depths ranging from 7 to 20 feet below existing grade within soil borings B-21 through B-26, corresponding to elevations ranging from 869 to 878-1/2 feet. The groundwater level was measured at depths ranging from 7 to 19-1/2 feet upon completion of drilling, which corresponds to elevations ranging from 872 to 878-1/2 feet and corresponds with the collapse depth of the borehole. With SB-1 and SB-2, no measurable groundwater was observed at completion of drilling above the collapse depth, which was higher than the encountered groundwater level within these borings.

### DHS Fieldhouse Parking, Drive, and Structural BMPs (B-27 through B-35)

During drilling operations, groundwater was encountered at approximate depths ranging from 10 to 19 feet below existing grade within soil borings B-27 through B-29 and B-31, corresponding to elevations ranging from 871 to 877-1/2 feet. The groundwater level was measured at depths ranging from 12 to 17-1/2 feet upon completion of drilling, which corresponds with elevations ranging from 866-1/2 to 880 feet and generally correspond with the collapse depths within these borings. No measurable groundwater was observed during or upon completion of drilling operations within borings B-30 or B-32 through B-35.

### Al Ritt Stadium Lighting (B-36 through B-39)

During drilling operations, groundwater was encountered at approximate depths ranging from 5 to 7 feet below existing grade within soil borings B-36 through B-39. The groundwater level was measured at depths ranging from

6 to 29 feet upon completion of drilling within B-36 through B-38, which corresponds with the collapse depth of the boreholes. No measurable groundwater was observed upon completion of drilling within soil boring B-39.

### General

The rise in the groundwater level above the encountered elevation within soil borings B-22, B-23, and B-31 may be indicative of an artesian condition.

Fluctuations in perched and long-term groundwater levels should be anticipated due to seasonal variations and following periods of prolonged precipitation. It should also be noted that groundwater observations made during drilling operations in predominantly cohesive soils are not necessarily indicative of the static groundwater level. This is due to the low permeability of such soils and the tendency of drilling operations to seal off the natural paths of groundwater flow.

## SITE PREPARATION RECOMMENDATIONS

### General

Existing fill soils are present within borings B-21, B-22, B-28, B-31, and B-33. The fill soils do not appear to have been placed in an engineered manner, include intermixed debris, and have organic matter contents ranging from 4.3 to 7.0 percent. Considering the existing ground surface elevations and the fieldhouse FFE, we anticipate the fill soils within the influence of the fieldhouse will be removed while adjusting site grades to achieve the design subgrade elevation, as illustrated on the Soil Boring Profile, Figure No. 42, in the Appendix. In addition, based on proposed pavement finished grades, we anticipate the existing fill soils will be removed during grading operations in the vicinity of soil borings B-28 and B-31. Some existing fill soil may remain beneath the proposed pavement section within the vicinity of soil boring B-33. The fill within soil boring B-33 does not contain any notable organic matter or debris and is generally considered suitable for support of the pavement, following the successful completion of a proof-roll/proof-compaction evaluation.

We anticipate earthwork operations will consist of the complete removal of trees, vegetation, and topsoil within the influence of the development areas, removal of any existing utilities within the influence of the fieldhouse, raising/lowering site grades to achieve design subgrade elevation, proof-rolling/proof-compacting the exposed subgrade, excavating for utilities, foundations, and structural BMPs, and preparing subgrade for floor slab and pavement support. We recommend all earthwork operations be performed in accordance with comprehensive specifications and be properly monitored in the field by qualified personnel under the direction of a licensed professional engineer.

At the start of earthwork operations, any existing trees, vegetation, and topsoil should be entirely removed within the proposed development areas. Any existing utilities and associated backfill within the structure footprint(s) should be completely removed and replaced with engineered fill. Where utilities lie outside the structures zone of influence, utilities to be abandoned can be filled with cementitious grout and left-in-place.

After site stripping, and cutting the site to rough grade, the exposed subgrade is expected to generally consist of native granular and cohesive soils. Prior to placement of engineered fill to raise site grades, where cohesive soils are present, soils should be proof-rolled with a fully loaded tandem-axle dump truck and be evaluated for stability. Unsuitable soils exhibiting excessive instability, such as severe rutting, should be improved with additional compaction or undercut to expose stable soils. Where granular soils are present, soils should be proof-compacted with a heavy smooth-drum vibratory roller and should be visually evaluated for instability and/or unsuitable soil conditions by a qualified geotechnical engineer or technician. We recommend 10 passes in two (2) perpendicular

directions during the proof-compaction operations. We recommend that the vibratory setting be turned off when within 25 feet of any existing structures. Any resulting undercut excavations should be evaluated for stability, improved as necessary, and should be backfilled with engineered fill.

Based on conducted laboratory testing, the moisture content of the surficial cohesive soils are approaching their respective plastic limit. Therefore, these subgrade soils may become unstable under repeated loading from construction equipment. The subgrade should not be exposed to prolonged periods of precipitation to prevent the subgrade from becoming unstable. We recommend earthwork operations be performed during the predominantly drier summer months.

### Engineered Fill

In general, we anticipate that the spoils generated from grade balancing within the influence of the fieldhouse and structural BMP excavations can be re-used as engineered fill elsewhere on site. However, soils including intermixed construction debris and/or organic matter should not be used as engineered fill throughout the proposed development areas, such as those observed within soil borings B-21 through B-23 and B-28.

Engineered fill should be free of organic matter, frozen soil, clods, or harmful material. The fill should be placed in uniform horizontal layers not more than 9-inches in loose thickness. The engineered fill should be compacted to achieve a dry density corresponding with 95 percent of the maximum dry density as determined by the Modified Proctor Compaction test (ASTM D1557).

To economically conduct earthwork operations at the site, imported fill, adhering to the aforementioned requirements, should consist of low plasticity clays or well-graded aggregates. Low plasticity clays, having a plasticity index less than 20 percent, should be placed within +3 or -1 percent of the optimum moisture content as determined by the Modified Proctor Test. For well-graded aggregates, such as MDOT Class II sand, we recommend the engineered fill be placed at ±2 percent of the optimum moisture content as determined by ASTM D1557.

We recommend the use of free-draining granular soils, such as MDOT Class II sand, within utility trenches and to backfill around below-grade walls. We recommend the use of engineered fill with a sufficient amount of fines (material passing the No. 200 sieve) in order to facilitate trenching and excavation techniques for strip and spread footing foundations.

## FOUNDATION RECOMMENDATIONS

Information regarding structural loading conditions associated with the fieldhouse and stadium light poles were unavailable at the time of this report. It is assumed that the fieldhouse will have column loads ranging from 75 to 150 kips and wall loads ranging form 3 to 6 kips per lineal foot. Once information regarding structural loading conditions becomes available, G2 should be notified to re-evaluate the recommendations provided herein, if necessary.

### Dexter High School Fieldhouse

Very loose clayey sand and very stiff silty clay fill is present within borings B-21 and B-22 near the northeast corner of the fieldhouse location. Considering the ground surface elevation at boring B-21 and B-22 range from 893 to 894 feet and the fieldhouse FFE is 887-1/2 feet, we anticipate the fill soils will be removed during grading operations to achieve the design subgrade elevation.

We recommend the fieldhouse be supported by shallow conventional strip and/or spread footings designed to bear at a minimum depth of 3-1/2 feet below finished grades within the native loose to medium compact granular soils, very stiff to hard cohesive soils, or engineered fill. Foundations bearing within the above mentioned soils can be designed based on a net allowable bearing capacity of 2,500 psf.

## Al Ritt Stadium Lighting

Loading conditions for the proposed light pole foundations was not available at the time of this report. However, based on our experience, we anticipate the light poles will be supported on drilled shaft foundations. We anticipate the drilled shafts will extend into the hard clay layer present at depths ranging from 6 to 13-1/2 feet in order to provide the necessary lateral support. The drilled shaft design is controlled by the overturning moment, thus bearing pressure imposed on the drilled shaft bottom is less than the recommended allowable bearing pressure of 9,000 psf. We recommend drilled shafts be designed using the following soil parameters:

| Boring No. | Depth (feet) | Soil | Cohesion (psf) | Angle of Friction (degrees) | Total Unit Weight (pcf) | Soil Modulus (pci) |
|---|---|---|---|---|---|---|
| B-36 | 0 to 3-1/2 | - | - | - | - | - |
| | 3-1/2 to 5 | Medium Compact Sand | 0 | 32 | 120 | 90 |
| | 5 to 8-1/2 | Medium Compact Sand | 0 | 32 | 120 | 60 |
| | 8-1/2 to 14-1/2 | Hard Clay | 4,500 | 0 | 135 | 700 |
| | 14-1/2 to 30 | Hard to Very Hard Clay | 8,000 | 0 | 140 | 800 |
| B-37 | 0 to 3-1/2 | - | - | - | - | - |
| | 3-1/2 to 6 | Loose Sand | 0 | 30 | 115 | 25 |
| | 6 to 13-1/2 | Loose Sand | 0 | 30 | 115 | 20 |
| | 13-1/2 to 17 | Hard Clay | 5,000 | 0 | 135 | 750 |
| | 17 to 30 | Hard to Very Hard Clay | 8,000 | 0 | 140 | 800 |
| B-38 | 0 to 3-1/2 | - | - | - | - | - |
| | 3-1/2 to 5 | Medium Compact Sand | 0 | 32 | 120 | 90 |
| | 5 to 6 | Medium Compact Sand | 0 | 32 | 120 | 60 |
| | 6 to 9-1/2 | Hard Clay | 4,500 | 0 | 135 | 700 |
| | 9-1/2 to 30 | Hard Clay | 5,000 | 0 | 135 | 750 |
| B-39 | 0 to 3-1/2 | - | - | - | - | - |
| | 3-1/2 to 6-1/2 | Loose Sand | 0 | 30 | 115 | 25 |
| | 6-1/2 to 8-1/2 | Loose Sand | 0 | 30 | 115 | 20 |
| | 8-1/2 to 13 | Very Stiff Clay | 2,000 | 0 | 130 | 300 |
| | 13 to 22 | Hard Clay | 5,000 | 0 | 135 | 750 |
| | 22 to 27 | Hard to Very Hard Clay | 8,000 | 0 | 140 | 800 |
| | 27 to 34-1/2 | Hard Clay | 5,000 | 0 | 135 | 750 |

## General

Continuous wall or strip footings should be at least 18 inches in width and isolated spread footings should be at least 36 inches in their least dimension. Exterior foundations must bear at a minimum depth of 3-1/2 feet below finished grade for protection against frost heave. Interior footings may bear at shallower depths provided they extend through fill soils, suitable bearing materials are available for support, and foundations are continuously protected from frost penetration during construction.

To achieve a change in the level of a strip footing, the footing should be gradually stepped at a grade no steeper than two horizontal units to one vertical unit (2H:1V). If required to construct foundations at different levels, adjacent spread foundation should be designed and constructed so the least lateral distance between the foundations is equivalent to or more than the difference in their bearing levels.

If the recommendations outlined in this report are adhered to, total and differential settlements for the completed structures should be within 1 inch and ½ inch, respectively. We expect settlements of these magnitudes are within tolerable limits for the type of structures proposed. We recommend all foundations be suitably reinforced to minimize the effects of differential settlements associated with local variations in subsoil conditions.

# FLOOR SLAB RECOMMENDATIONS

As previously stated, we anticipate the fill soils encountered within borings B-21 and B-22 will be removed in order to achieve the design subgrade elevation within the influence of the fieldhouse. The fieldhouse will have a FFE of 887-1/2 feet and we anticipate the floor slab will be supported by native granular/cohesive soils and/or engineered fill overlying native soils.

Following satisfactory completion of the subgrade preparation recommendations as described within the *SITE PREPARATION RECOMMENDATIONS* section of this report, a subgrade modulus (k) of 125 pounds per cubic inch (pci) may be used for design of the fieldhouse floor slab supported by the aforementioned soils.

We recommend at least 4-inches of clean free-draining material, such as 2NS sand or pea gravel, be placed between the subgrade and the bottom of the floor slab for use as a capillary break to reduce moisture transmission through the concrete floors and to reduce the potential for concrete curling. If moisture sensitive floor coverings are planned or if greater protection against vapor transmission is desired, a vapor barrier consisting of 10-mil plastic sheeting, or equivalent, may be placed on the sand layer beneath floor slabs. However, additional floor slab curing techniques will be required especially if floor slab placement occurs in the winter months to prevent floor slab curling. The floor slab should be isolated from the foundation system to allow for independent movement.

# PAVEMENT RECOMMENDATIONS

## General

We understand that a bituminous concrete service drive and parking areas will be constructed near the fieldhouse. Information regarding anticipated traffic frequencies was unavailable at the time of this report; however, we understand a heavy-duty pavement section will be constructed. It is assumed that traffic will primarily consist of PCVs and school buses with occasional waste management, emergency response, and delivery vehicles. Once information regarding anticipated traffic frequencies becomes available, G2 should be notified to re-evaluate the recommendations provided herein.

We anticipate some subgrade instability will be encountered throughout the pavement areas depending on the time of year of construction. We recommend limiting undercuts to a depth of 12 inches below proposed aggregate base, compacting the exposed subgrade, and backfilling with MDOT 21AA dense-graded aggregate. If a stable subgrade cannot be achieved at a maximum depth of 12 inches below the proposed subgrade, we recommend placing a geogrid reinforcement, such as TENSAR Tri-Ax geogrid (Type III) or equivalent, at a depth of 12 inches below proposed subgrade and backfilling with MDOT 21AA aggregate. The geogrid should extend to a minimum of 5 feet beyond the edges of the unstable area. Any undercut areas within predominantly clayey soils should be connected with finger drains to the closest catch basins to drain water from within the granular undercut backfill material.

## Pavement Design

Provided the site recommendations in the *SITE PREPARATION RECOMMENDATIONS* section of this report are adhered to, we recommend a subgrade resilient modulus of 6,000 pounds per square inch (psi) be used for the anticipated subgrade soils. Based on the anticipated traffic frequencies, we have designed a heavy-duty bituminous concrete pavement section based on an estimated 300,000 equivalent single axle loads (ESALs) over a 20-year design life. For evaluation purposes, we estimated a serviceability loss of 2.2, a standard deviation of 0.45, and a reliability of 90 percent. Based on the results of our analysis, we recommend the following minimum pavement design cross-section:

**Typical Heavy-Duty Flexible Pavement Section**

| Material | Thickness | Structural Coefficient |
|---|---|---|
| MDOT 5EML Bituminous Wearing Course | 2 inches | 0.42 |
| MDOT 4EML Bituminous Leveling Course | 3 inches | 0.42 |
| MDOT 21AA Aggregate Base (dense-graded) | 10 inches | 0.14 |
| | | Total SN = 3.5 |

Large front-loading refuse trucks can impose significant concentrated wheel loads within trash dumpster pick-up areas and loading and delivery areas. This type of loading can result in rutting of bituminous concrete pavements and ultimately in failure. Therefore, we recommend reinforced Portland cement concrete pavement be used in this area and be large enough to accommodate the entire truck during pick-up operations.

All pavement materials are specified within the 2020 Standard Specifications for Construction from the Michigan Department of Transportation. The bituminous pavement materials are described in Section 501 and 904 and can be assigned a structural coefficient number of 0.42. The Portland cement concrete pavement materials are described in Section 601. Any imported MDOT 21AA dense-graded aggregate base course can be assigned a structural coefficient number of 0.14. The aggregate materials for the subbase are described in Section 902. We recommend that bituminous concrete utilize grade PG 68-22 binder, with no more than 17 percent of the overall binder content from reclaimed asphalt pavement (RAP) within the top wearing course layer.

## Pavement Drainage and Maintenance

Proper drainage is an important consideration for pavement design, especially in consideration of the cohesive soils. The pavement and subgrade should be properly sloped to promote effective surface and subsurface drainage and prevent water ponding. We recommend edge drains be installed around the perimeter of the pavement areas.

Regular timely maintenance should be performed on the pavement to reduce the potential deterioration associated with moisture infiltration through surface cracks. The owner should be prepared to seal the cracks with a hot-applied elastic crack filler as soon as possible after cracking develops and as often as necessary to block the passage of water to the subgrade soils.

# STRUCTURAL BMP RECOMMENDATIONS

We understand that structural BMPs consisting of a detention pond and two (2) underground stormwater management structures will be constructed adjacent to the fieldhouse. The detention pond will be constructed on the east side of the fieldhouse and the two (2) underground stormwater management structures will be constructed below the parking areas on the east and west sides of the fieldhouse. The invert elevations of the BMPs were unavailable at the time of this report. Once this information becomes available, G2 should be notified to re-evaluate the recommendations provided herein. We understand the intent of the BMPs are to capture and detain stormwater runoff until redirected to the natural water cycle by means of subsurface infiltration.

Soil borings B-27 and B-28 were drilled within the vicinity of the proposed west underground stormwater structure, soil boring B-29 was drilled within the proposed detention pond, and soil borings B-30 and B-31 were drilled in the vicinity of the east underground stormwater structure. Following grade cuts, the soils within borings B-27 and B-28 are cohesive in nature, which can be considered relatively impermeable and do not promote subsurface infiltration. Site grades will be raised by several feet in the area of the detention pond. Predominantly cohesive soils are also present within soil boring B-29 to an approximate depth of 8-1/2 feet, or approximately 11-1/2 feet below proposed grade. We do not anticipate the proposed detention pond will extend below 11-1/2 feet; therefore, the detention pond should be expected to retain water and an overflow structure will be required. Sand and gravelly sand are present within soil borings B-30 and B-31 at depths of 2-1/2 to 6 feet below proposed finished grade and extend to depths ranging from 7-1/2 to 20 feet below finished grade. We anticipate these soils will allow for subsurface infiltration beneath the eastern parking lot.

Per Washtenaw County guidelines, each BMP must have an invert elevation three (3) feet above the seasonally high groundwater table. The granular soils within borings B-30 and B-31 could promote subsurface infiltration, provided the BMP invert is sufficiently above the seasonally high groundwater table. Once the BMP invert elevations become available, we recommend that supplemental test pit excavations and in-situ infiltration testing be performed at each BMP location.

# CONSTRUCTION CONSIDERATIONS

## Open Cut Excavations

We anticipate caving and/or sloughing of the surficial granular soils during shallow foundation excavation operations. As such, the foundation contractor should come prepared to over-excavate and form foundation excavations within the granular soils. Where cohesive soils are present, we anticipate foundations can be earth formed. If earth formed foundations are utilized, we recommend foundation excavation and concrete placement operations be conducted on the same day to minimize potential for cave-ins or stormwater run-off into the open excavations.

Based on the observations within soil borings B-21 through B-35, groundwater is present below Elevations 871 to 878-1/2 feet. However, based on the proposed FFE of 887-1/2 feet, we do not anticipate construction excavations for the proposed fieldhouse, utilities, or BMPs will extend below the groundwater table. We anticipate any groundwater seepage or surface runoff can be controlled with a properly constructed system of sumps and pumps.

We recommend maximum slope inclinations of 2H:1V within the very loose to loose granular soils, 1-1/2H:1V within the medium compact granular and medium cohesive soils, 1H:1V within the compact granular and stiff cohesive

soils, and 3/4H:1V within the very stiff to hard cohesive soils for excavations extending below a depth of 5 feet. Where seepage from excavation cuts is observed, the slopes will need to be flattened sufficiently to achieve stability, but in no case left steeper than 3H:1V at and below the seepage level.

All excavations should be safely sheeted, shored, sloped, or braced in accordance with MI-OSHA requirements. If material is stored or equipment is operations near an excavation, lower angle slopes or stronger shoring must be used to resist the extra pressure due to the superimposed loads.

## Drilled Piers

Caving and/or sloughing of the granular soils will occur during drilled shaft excavation operations. In addition, groundwater was encountered at depths ranging from 5 to 7 feet below existing grade. Therefore, the drilled pier contractor should come to the site prepared to extend temporary steel casing through the granular soils and into the underlying cohesive soils to maintain a stable excavation and seal off groundwater during construction operations. The contractor should also come to the site prepared to break-up and remove any cobbles encountered in the excavation and may need a rock auger to excavate through the very hard cohesive soils. Under no circumstances should concrete fall through standing water at the base of the excavation. Therefore, if groundwater cannot be controlled with temporary casing, concrete must be placed by tremie method.

Once drilling is completed to the design depth, reinforcing steel should be set and concrete placed until a positive head of concrete has been established within the casing. This positive concrete head should be maintained while pulling the casing to prevent sloughing of the granular soils into the fresh concrete. After concrete has been placed to an appropriate grade, the casing may be removed and concrete placement operations completed. The telescoped casing, if used, must be removed in the opposite order in which it is installed (i.e. – from the inside out).

To reduce lateral movement of the drilled pier foundations, the contractor must place the concrete for the pier in intimate contact with undisturbed soil. Fill any voids or enlargements in the drilled pier shaft excavation with concrete at the time of drilled pier concrete placement. We recommend using a concrete mix design with a slump of 5 to 7 inches for free fall placement and 7 to 9 inches for tremie placement to reduce the potential for concrete arching and provide a workable material.

We recommend using a short temporary top form, such as a Sonotube, to form the top portion of the drilled pier. The use of this top form is a beneficial aid to the correct placement and orientation of the anchor bolts.

## Directional Drilling Installation

We understand electrical conduits will be installed via direction drilling beneath the existing football field at Al Ritt Stadium. In general, we anticipate the soil conditions will be conducive to directional drilling installation methods; however, some degree of difficulty may be encountered as the directional drilling cutting head approaches the interface between the very stiff to hard cohesive and very loose to loose granular soils. We recommend an experienced contractor with the resources to provide appropriate designs as well as provide the proper equipment to penetrate the anticipated soils perform the installation operations.

Drilling fluid should be used during drilling and back-reaming operations. Drilling fluid should be composed of environmentally clean water and should be amended using appropriate additives for the specific soil types to be encountered. Potentially hazardous materials should not be used in drilling fluid. Based on the soil conditions at the site, we recommend the fluid pressure and pumping rate for pilot drilling and pre-ream be commensurate with the subsurface conditions and the drilling fluid viscosity and density be appropriate for the anticipated variations of the subsurface conditions.

We recommend the drilling contractor periodically evaluate the specific gravity, unit weight, and sand content of the drilling fluid to mitigate the potential for the buildup of excess pressure behind the cutting head.

## GENERAL COMMENTS

We have formulated the evaluations and recommendations presented in this report relative to site preparation and foundation construction on the basis of data provided to us relating to the project location and surface grade for the proposed site(s). Any significant change in this data should be brought to our attention for review and evaluation with respect to prevailing subsurface conditions. Furthermore, if changes occur in the design, location, or concept of the project, conclusions and recommendations contained in this report are not valid unless G2 reviews the changes. G2 will then confirm the recommendations presented herein or make changes in writing.

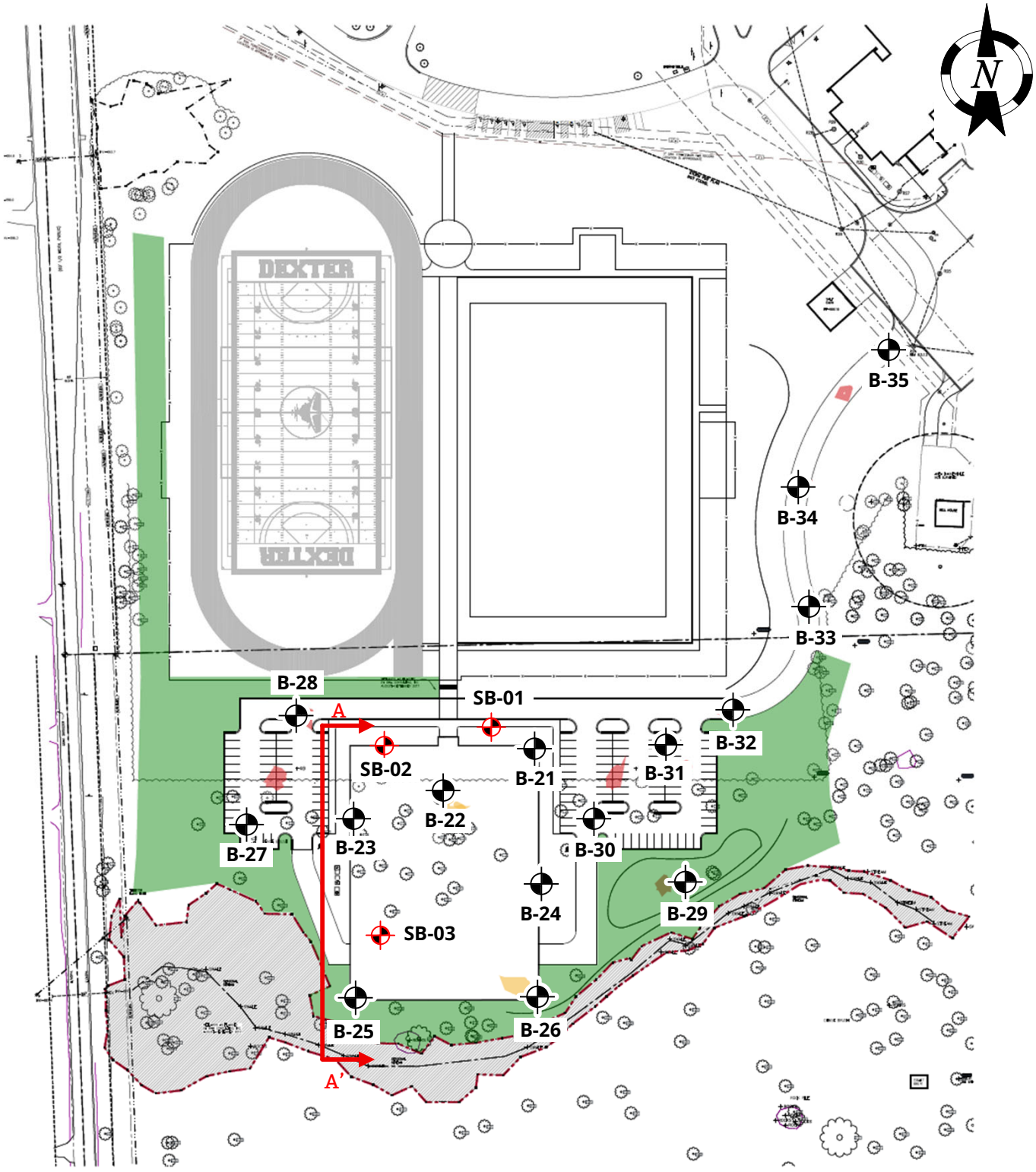
The scope of the present investigation was limited to evaluation of subsurface conditions for the support of proposed structures and other aspects of the proposed improvements. No chemical, environmental, or hydrogeological testing or analyses were included in the scope of this investigation.

We base the analyses and recommendations submitted in this report upon the data from the soil borings performed at the approximate locations shown on the Soil Boring Location Plans, Plate Nos. 1 and 2. This report does not reflect variations that may occur between the actual boring locations and the actual structure locations. The nature and extent of any such variations may not become clear until the time of construction. If significant variations then become evident, it may be necessary for us to re-evaluate our report recommendations.

We recommend G2 Consulting Group, LLC observe all geotechnical related work, including subgrade preparation, foundation construction, and engineered fill placement. G2 Consulting Group, LLC will perform the appropriate testing to confirm the geotechnical conditions given in the report are found during construction.

# APPENDIX


| | |
|---|---|
| SOIL BORING LOCATION PLANS | PLATE NOS. 1 AND 2 |
| SOIL BORING LOGS | FIGURE NOS. 21 THROUGH 39 |
| SOIL BORING PROFILE A-A' | FIGURE NO. 40 |
| ATTERBERG LIMITS TEST RESULTS | FIGURE NO. 41 |
| GENERAL NOTES TERMINOLOGY | FIGURE NO. 42 |
| DRIESENGA & ASSOCIATES, INC. SOIL BORING LOGS | |




## Legend

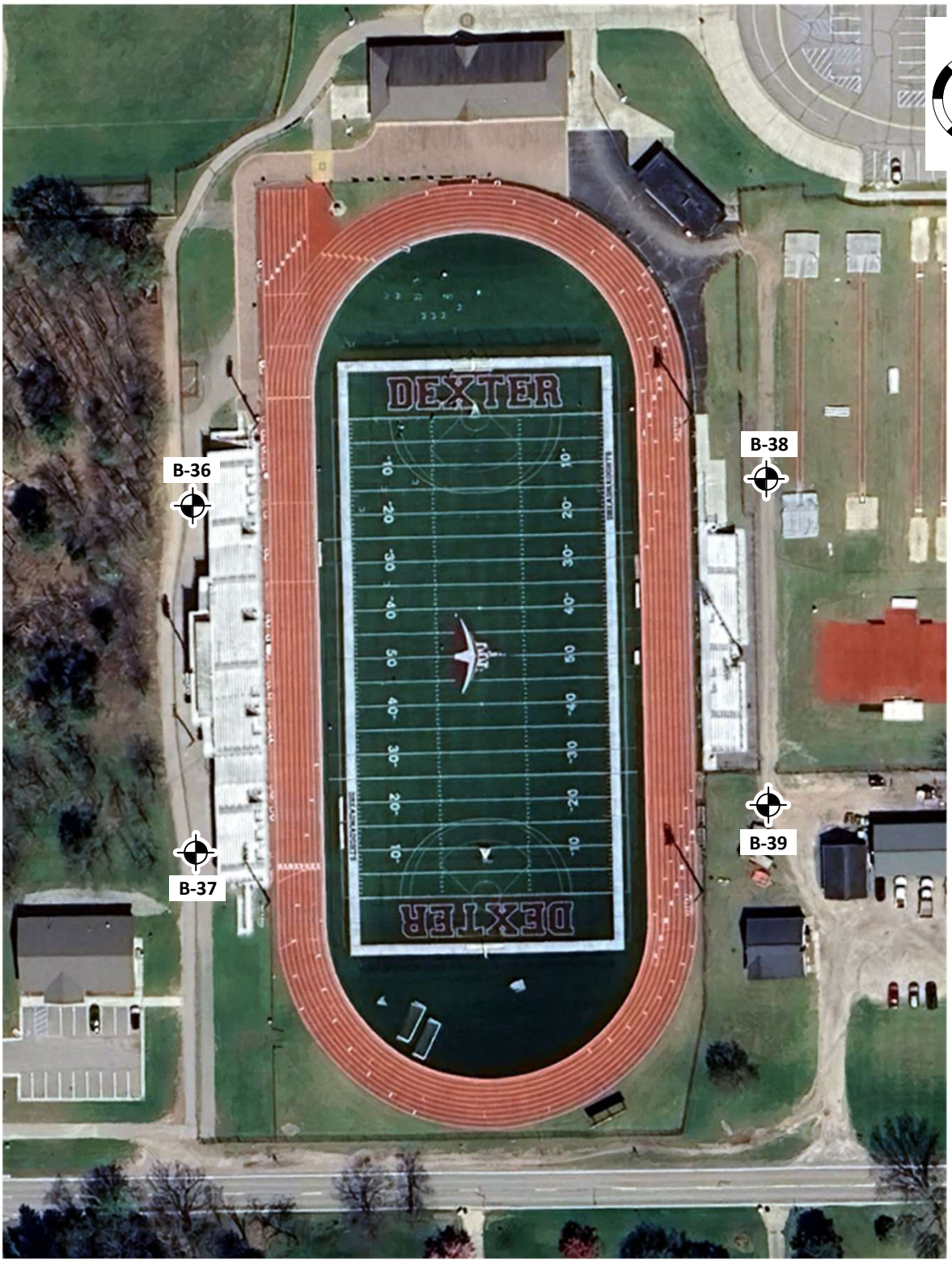
- Soil Borings performed by 2G Drilling between December 1, 2025 and December 8, 2025
- Preliminary soil sorings performed by others

## Soil Boring Location Plan

2025 Dexter Bond Program
DHS Fieldhouse and Site Improvements
2200 N. Parker Road
Dexter, Michigan 48130

2G CONSULTING GROUP Smart.Results.Fast.

| | |
|---|---|
| Project No. 253566 | |
| Drawn by: TSH | |
| Date: 1-5-2026 | Plate No. 1 |
| Scale: NTS | |




## Legend

Soil Borings perform by 2G Drilling between December 1, 2025 and December 8, 2025

**Soil Boring Location Plan**

2025 Dexter Bond Program
Al Ritt Stadium Lighting
2521 Baker Road
Dexter, Michigan 48130

2G CONSULTING GROUP Smart.Results.Fast.

| | |
|---|---|
| Project No. 253566 | |
| Drawn by: TSH | |
| Date: 1-5-2026 | Plate No. 2 |
| Scale: NTS | |

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.31903° Longitude: -83.89737°

# Soil Boring No. B-21

CONSULTING GROUP

## SUBSURFACE PROFILE

## SOIL SAMPLE DATA

| ELEV. (ft) | PRO-FILE | GROUND SURFACE ELEVATION: 894.0 ft | DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil: Dark Brown Silty Sand (10 inches) 0.8 | | | | | | | |
| | | Fill: Very Loose Brown Clayey Sand; intermixed wood chips | | S-01 | 3 1 1 | 2 | | | |
| | | 3.5 | | | | | | | |
| 889.0 | | Stiff Brown Silty Clay with trace sand and gravel | 5 | S-02 | 2 5 4 | 9 | 20.7 | | 2500* |
| | | | | S-03 | 2 5 3 | 8 | 13.8 | | 2500* |
| | | 8.5 | | | | | | | |
| 884.0 | | Loose to Medium Compact Brown Sand with trace silt and gravel | 10 | S-04 | 3 5 4 | 9 | | | |
| 879.0 | | | 15 | S-05 | 4 13 14 | 27 | | | |
| | | 18.5 | | | | | | | |
| 874.0 | | Medium Compact Brown Gravelly Sand | 20 | S-06 | 14 8 10 | 18 | | | |
| | | 22.5 | | | | | | | |
| 869.0 | | Medium Compact Brown Clayey Sand with trace silt and gravel 25.0 | 25 | S-07 | 3 4 8 | 12 | | | |
| | | End of Boring @ 25 ft | | | | | | | |
| 864.0 | | | 30 | | | | | | |

Total Depth: 25 ft
Drilling Date: December 1, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
20 feet during drilling operations; wet cave at 19-1/2 feet after auger removal

Notes:
Borehole collapsed at 19-1/2 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 21

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.31895° Longitude: -83.89776°

# Soil Boring No. B-22

CONSULTING GROUP

## SUBSURFACE PROFILE

## SOIL SAMPLE DATA

| ELEV. (ft) | PRO-FILE | GROUND SURFACE ELEVATION: 893.0 ft | DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil: Dark Brown Sandy Clay (4 inches) 0.3 | | | | | | | |
| | | Fill: Very Stiff Brown Silty Clay with trace sand and gravel; intermixed roots | | S-01 | 2 4 6 | 10 | 19.0 | | 5000* |
| | | 3.5 | | | | | | | |
| 888.0 | | | 5 | S-02 | 3 7 8 | 15 | 11.8 | | 7000* |
| | | | | S-03 | 3 7 10 | 17 | 12.9 | | 9000* |
| | | Very Stiff to Hard Brown Silty Clay with trace sand and gravel; occasional sand seams | | | | | | | |
| 883.0 | | | 10 | S-04 | 2 4 7 | 11 | 10.6 | | 5000* |
| | | 13.5 | | | | | | | |
| 878.0 | | | 15 | S-05 | 1 2 4 | 6 | 12.1 | | 2000* |
| | | Stiff Gray Sandy Clay with trace silt and gravel | | | | | | | |
| | | 19.5 | | | | | | | |
| 873.0 | | | 20 | S-06 | 2 4 6 | 10 | 13.3 | | 4000* |
| | | Very Stiff Grayish Brown Sandy Clay with trace silt and gravel; occasional sand layers | | | | | | | |
| | | 23.5 | | | | | | | |
| | | Medium Compact Gray Gravelly Sand 25.0 | | | | | | | |
| 868.0 | | | 25 | S-07 | 4 7 9 | 16 | | | |
| | | End of Boring @ 25 ft | | | | | | | |
| 863.0 | | | 30 | | | | | | |

Total Depth: 25 ft
Drilling Date: December 1, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
20 feet during drilling operations; wet cave at 18-1/2 feet after auger removal

Notes:
Borehole collapsed at 18-1/2 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 22

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.31879° Longitude: -83.89816°

# Soil Boring No. B-23

CONSULTING GROUP

## SUBSURFACE PROFILE

## SOIL SAMPLE DATA

| ELEV. (ft) | PRO-FILE | GROUND SURFACE ELEVATION: 892.0 ft | DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil: Dark Brown Silty Clay (4 inches) 0.3 | | | | | | | |
| | | Hard Brown Silty Clay with trace sand and gravel; intermixed roots | | S-01 | 7<br>12<br>14 | 26 | 17.5 | | 9000* |
| | | 3.0 | | | | | | | |
| 887.0 | | Hard Brown Sandy Clay with trace silt and gravel; occasional sand seams | 5 | S-02 | 10<br>11<br>17 | 28 | 10.8 | | 9000* |
| | | 7.0 | | S-03 | 6<br>6<br>9 | 15 | | | |
| 882.0 | | Medium Compact Brown Sand with trace silt and gravel; occasional clayey sand layers | 10 | S-04 | 4<br>6<br>7 | 13 | | | |
| | | 14.5 | | | | | | | |
| 877.0 | | Hard Gray Sandy Clay with trace gravel | 15 | S-05 | 1<br>17<br>25 | 42 | 9.6 | | 9000* |
| | | 19.0 | | | | | | | |
| 872.0 | | Medium Compact Gray Clayey Sand with trace silt and gravel | 20 | S-06 | 3<br>7<br>6 | 13 | | | |
| | | 23.5 | | | | | | | |
| 867.0 | | Very Loose Gray Clayey Sand with trace silt and gravel 25.0 | 25 | S-07 | 1<br>1<br>2 | 3 | | | |
| | | End of Boring @ 25 ft | | | | | | | |
| 862.0 | | | 30 | | | | | | |

Total Depth: 25 ft
Drilling Date: December 3, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
20 feet during drilling operations; wet cave at 18-1/2 feet after auger removal

Notes:
Borehole collapsed at 18-1/2 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 23

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.3186° Longitude: -83.89735°

# Soil Boring No. B-24

CONSULTING GROUP

## SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 886.0 ft

| ELEV. (ft) | PRO-FILE | | DEPTH (ft) |
|---|---|---|---|
| | | Topsoil: Dark Brown Clayey Sand (6 inches) — 0.5 | |
| | | Medium Compact Reddish Brown Clayey Sand with trace silt and gravel — 3.5 | |
| 881.0 | | Medium Compact Brown Clayey Sand with trace silt and gravel — 6.0 | 5 |
| 876.0 | | Stiff Brown Sandy Clay with trace silt and gravel — 13.5 | 10 |
| 871.0 | | Compact Gray Sandy Silt — 18.5 | 15 |
| 866.0 | | Hard Gray Sandy Clay with trace silt and gravel; occasional cobbles (Hardpan) — 25.0 | 20 |
| 861.0 | | End of Boring @ 25 ft | 25 |
| 856.0 | | | 30 |

## SOIL SAMPLE DATA

| SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|
| S-01 | 3 7 8 | 15 | | | |
| S-02 | 4 7 9 | 16 | | | |
| S-03 | 3 5 6 | 11 | 10.3 | | 3000* |
| S-04 | 4 7 9 | 16 | 14.0 | | 2000* |
| S-05 | 8 13 18 | 31 | | | |
| S-06 | 16 50/5" | --- | 8.2 | | 9000* |
| S-07 | 47 50/5" | --- | 8.6 | | 9000* |

Total Depth: 25 ft
Drilling Date: December 2, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
15 feet during drilling operations; wet cave at 15 feet after auger removal

Notes:
Borehole collapsed at 15 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 24

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.31825° Longitude: -83.89815°

# Soil Boring No. B-25

CONSULTING GROUP

## SUBSURFACE PROFILE

## SOIL SAMPLE DATA

| ELEV. (ft) | PRO-FILE | GROUND SURFACE ELEVATION: 885.5 ft | DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil: Dark Brown Sandy Clay (7 inches) 0.6 | | | | | | | |
| | | | | S-01 | 6 7 9 | 16 | 9.4 | | 9000* |
| | | Hard Mottled Brown and Gray Sandy Clay with trace silt and gravel | | | | | | | |
| 880.5 | | (Mild hydrocarbon odor) | 5 | S-02 | 7 7 8 | 15 | 15.9 | | 8000* |
| | | 6.0 | | S-03 | 3 7 8 | 15 | | | |
| 875.5 | | Medium Compact Brown Sand with trace silt and gravel | 10 | S-04 | 15 12 13 | 25 | | | |
| | | 14.0 | | | | | | | |
| 870.5 | | Very Loose Gray Sandy Silt | 15 | S-05 | 1 1 3 | 4 | | | |
| | | 18.5 | | | | | | | |
| 865.5 | | Stiff Gray Sandy Clay with trace silt and gravel; occasional clayey sand seams | 20 | S-06 | 3 3 4 | 7 | 14.5 | | 3000* |
| | | 24.0 | | | | | | | |
| 860.5 | | Hard Gray Sandy Clay with trace silt and gravel (Hardpan) 25.0 | 25 | S-07 | 70 50/1" | --- | 8.6 | | 9000* |
| | | End of Boring @ 25 ft | | | | | | | |
| 855.5 | | | 30 | | | | | | |

Total Depth: 25 ft
Drilling Date: December 2, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
7 feet during drilling operations; wet cave at 7 feet after auger removal

Notes:
Borehole collapsed at 7 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 25

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.31825° Longitude: -83.89735°

# Soil Boring No. B-26

CONSULTING GROUP

## SUBSURFACE PROFILE

## SOIL SAMPLE DATA

| ELEV. (ft) | PRO-FILE | GROUND SURFACE ELEVATION: 882.0 ft | DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil: Dark Brown Clayey Sand (7 inches) 0.6 | | | | | | | |
| | | Medium Compact Brown Clayey Sand with trace silt and gravel | | S-01 | 4 5 7 | 12 | | | |
| | | 3.0 | | | | | | | |
| 877.0 | | Loose Brown Silty Sand with trace gravel | 5 | S-02 | 6 5 4 | 9 | | | |
| | | 6.0 | | | | | | | |
| | | Loose Brown Clayey Sand with trace silt and gravel | | S-03 | 2 3 4 | 7 | | | |
| | | 8.0 | | | | | | | |
| 872.0 | | Compact Brown Gravelly Sand with trace silt | 10 | S-04 | 5 10 21 | 31 | | | |
| | | 13.5 | | | | | | | |
| 867.0 | | Very Stiff Gray Clayey Silt | 15 | S-05 | 8 11 16 | 27 | 15.4 | | 6000* |
| | | 19.0 | | | | | | | |
| 862.0 | | Hard Gray Sandy Clay with trace silt and gravel; occasional sand layers | 20 | S-06 | 14 23 25 | 48 | 10.0 | | 9000* |
| | | 24.0 | | | | | | | |
| 857.0 | | Hard to Very Hard Gray Sandy Clay with trace silt and gravel (Hardpan) 25.0 | 25 | S-07 | 26 50/5" | --- | 10.2 | | 9000* |
| | | End of Boring @ 25 ft | | | | | | | |
| 852.0 | | | 30 | | | | | | |

Total Depth: 25 ft
Drilling Date: December 2, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
7 feet during drilling operations; wet cave at 8-1/2 feet after auger removal

Notes:
Borehole collapsed at 8-1/2 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 26

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/9/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.31879° Longitude: -83.89861°

# Soil Boring No. B-27

CONSULTING GROUP

## SUBSURFACE PROFILE

## SOIL SAMPLE DATA

| ELEV. (ft) | PRO-FILE | GROUND SURFACE ELEVATION: 892.0 ft | DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil: Dark Brown Sandy Clay (5 inches) 0.4 | | | | | | | |
| | | Compact Brown Silty Sand with trace gravel; occasional sandy clay layers | | S-01 | 11 17 28 | 45 | | | |
| | | 3.5 | | | | | | | |
| 887.0 | | Hard Mottled Brown and Gray Sandy Clay with trace silt and gravel | 5 | S-02 | 11 11 8 | 19 | 17.1 | | 9000* |
| | | | | S-03 | 6 10 12 | 22 | 9.5 | | 9000* |
| | | 8.0 | | | | | | | |
| 882.0 | | Very Stiff Brown Sandy Clay with trace silt and gravel; occasional sand seams | 10 | S-04 | 5 8 10 | 18 | 12.1 | | 7000* |
| | | 13.5 | | | | | | | |
| 877.0 | | Stiff Gray Sandy Clay with trace silt and gravel | 15 | S-05 | 2 2 4 | 6 | 10.0 | | 2500* |
| | | 18.5 | | | | | | | |
| 872.0 | | Loose Gray Clayey Sand with trace silt and gravel 20.0 | 20 | S-06 | 4 4 6 | 10 | | | |
| | | End of Boring @ 20 ft | | | | | | | |
| 867.0 | | | 25 | | | | | | |
| 862.0 | | | 30 | | | | | | |

Total Depth: 20 ft
Drilling Date: December 3, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
17-1/2 feet during drilling operations; wet cave at 17-1/2 feet after auger removal

Notes:
Borehole collapsed at 17-1/2 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 27

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.31914° Longitude: -83.89836°

# Soil Boring No. B-28

CONSULTING GROUP

## SUBSURFACE PROFILE

## SOIL SAMPLE DATA

| ELEV. (ft) | PRO-FILE | GROUND SURFACE ELEVATION: 892.5 ft | DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil: Dark Brown Silty Clay (6 inches) 0.5 | | | | | | | |
| | | Fill: Very Stiff Mottled Brown and Gray Silty Clay with trace sand and gravel; intermixed organic matter (Organic Matter Content = 4.3%) | | S-01 | 4 10 7 | 17 | 17.6 | | 6000* |
| | | 3.5 | | | | | | | |
| 887.5 | | Fill: Stiff Very Dark Brown Silty Clay; intermixed peat (Organic Matter Content = 7.0%) | 5 | S-02 | 3 4 4 | 8 | 28.4 | | 2000* |
| | | 6.0 | | S-03 | 2 3 4 | 7 | 11.4 | | 6000* |
| 882.5 | | Very Stiff Brown Sandy Clay with trace silt and gravel | 10 | S-04 | 3 4 7 | 11 | 10.2 | | 6000* |
| | | 13.5 | | S-05 | 4 4 4 | 8 | 11.9 | | 3000* |
| 877.5 | | Stiff Gray Sandy Clay with trace silt and gravel | 15 | | | | | | |
| | | 18.5 | | S-06 | 5 6 6 | 12 | 12.4 | | 3000* |
| 872.5 | | Stiff Gray Clayey Silt 20.0 | 20 | | | | | | |
| | | End of Boring @ 20 ft | | | | | | | |
| 867.5 | | | 25 | | | | | | |
| 862.5 | | | 30 | | | | | | |

Total Depth: 20 ft
Drilling Date: December 1, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
15 feet during drilling operations; wet cave at 16-3/4 feet after auger removal

Notes:
Borehole collapsed at 17 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 28

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.31862° Longitude: -83.89674°

# Soil Boring No. B-29

CONSULTING GROUP

## SUBSURFACE PROFILE

## SOIL SAMPLE DATA

| ELEV. (ft) | PRO-FILE | GROUND SURFACE ELEVATION: 881.0 ft | DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil: Dark Brown Sandy Clay (7 inches) 0.6 | | | | | | | |
| | | Stiff Brown Sandy Clay with trace silt and gravel; occasional clayey sand layers | | S-01 | 6<br>10<br>9 | 19 | 14.7 | | 3000* |
| | | 3.0 | | | | | | | |
| 876.0 | | Loose to Medium Compact Brown Clayey Sand with trace silt and gravel; occasional cobbles | 5 | S-02 | 5<br>12<br>12 | 24 | | | |
| | | | | S-03 | 4<br>5<br>5 | 10 | | | |
| | | 8.5 | | | | | | | |
| 871.0 | | | 10 | S-04 | 6<br>14<br>14 | 28 | | | |
| | | | | | | | | | |
| 866.0 | | Medium Compact to Compact Brown Gravelly Sand with trace silt and clay | 15 | S-05 | 10<br>20<br>16 | 36 | | | |
| | | | | | | | | | |
| 861.0 | | 20.0 | 20 | S-06 | 12<br>17<br>17 | 34 | | | |
| | | End of Boring @ 20 ft | | | | | | | |
| 856.0 | | | 25 | | | | | | |
| 851.0 | | | 30 | | | | | | |

Total Depth: 20 ft
Drilling Date: December 2, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
10 feet during drilling operations; wet cave at 14-3/4 feet after auger removal

Notes:
Borehole collapsed at 15 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 29

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.31879° Longitude: -83.8970°

# Soil Boring No. B-30

CONSULTING GROUP

## SUBSURFACE PROFILE

## SOIL SAMPLE DATA

| ELEV. (ft) | PRO-FILE | GROUND SURFACE ELEVATION: 886.0 ft | DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil: Dark Brown Silty Sand (6 inches) 0.5 | | | | | | | |
| | | Loose Brown Clayey Sand with trace silt and gravel | | S-01 | 6<br>5<br>3 | 8 | | | |
| | | 3.0 | | | | | | | |
| 881.0 | | Stiff Brown Sandy Clay with trace silt and gravel | 5 | S-02 | 4<br>4<br>3 | 7 | 12.2 | | 2000* |
| | | 6.0 | | S-03 | 8<br>11<br>17 | 28 | | | |
| 876.0 | | | 10 | S-04 | 12<br>19<br>21 | 40 | | | |
| 871.0 | | Medium Compact to Compact Brown Sand with trace silt and gravel | 15 | S-05 | 9<br>10<br>13 | 23 | | | |
| | | 18.5 | | | | | | | |
| 866.0 | | Compact Brown Sandy Gravel with trace silt 20.0 | 20 | S-06 | 10<br>25<br>12 | 37 | | | |
| | | End of Boring @ 20 ft | | | | | | | |
| 861.0 | | | 25 | | | | | | |
| 856.0 | | | 30 | | | | | | |

Total Depth: 20 ft
Drilling Date: December 2, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
Dry during drilling operations; dry cave at 14 feet after auger removal

Notes:
Borehole collapsed at 14 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 30

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.31904° Longitude: -83.89682°

# Soil Boring No. B-31

CONSULTING GROUP

## SUBSURFACE PROFILE

## SOIL SAMPLE DATA

| ELEV. (ft) | PRO-FILE | GROUND SURFACE ELEVATION: 892.0 ft | DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil: Dark Brown Sandy Clay (2 inches) 0.2 | | | | | | | |
| | | Fill: Stiff Brown Sandy Clay with trace silt and gravel; occasional clayey sand layers | | S-01 | 5 6 6 | 12 | 15.1 | | 3000* |
| | | 3.0 | | | | | | | |
| 887.0 | | Medium Compact Brown Sandy Silt with trace gravel | 5 | S-02 | 5 7 8 | 15 | | | |
| | | 6.0 | | | | | | | |
| | | Very Stiff Brown Silty Clay with trace sand and gravel | | S-03 | 7 8 16 | 24 | 11.7 | | 7000* |
| | | 8.5 | | | | | | | |
| 882.0 | | Compact Brown Gravelly Sand with trace silt | 10 | S-04 | 12 17 16 | 33 | | | |
| | | 13.5 | | S-05 | 5 7 11 | 18 | | | |
| 877.0 | | Medium Compact Brown Clayey Sand with trace silt and gravel; occasional gravelly sand layers | 15 | | | | | | |
| | | 20.0 | 20 | S-06 | 2 6 9 | 15 | | | |
| 872.0 | | End of Boring @ 20 ft | | | | | | | |
| 867.0 | | | 25 | | | | | | |
| 862.0 | | | 30 | | | | | | |

Total Depth: 20 ft
Drilling Date: December 3, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
19 feet during drilling operations; wet cave at 12 feet after auger removal

Notes:
Borehole collapsed at 12 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 31

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.31915° Longitude: -83.89652°

# Soil Boring No. B-32

CONSULTING GROUP

## SUBSURFACE PROFILE

## SOIL SAMPLE DATA

| ELEV. (ft) | PRO-FILE | GROUND SURFACE ELEVATION: 891.0 ft | DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil: Dark Brown Sandy Clay (4 inches) 0.3 | | | | | | | |
| | | Hard Brown Silty Clay with trace sand and gravel (LL = 21, PI = 6) | | S-01 | 8 7 7 | 14 | 12.1 | | 9000* |
| 886.0 | | 4.5 | 5 | S-02 | 8 12 9 | 21 | | | |
| | | Medium Compact Brown Silty Sand with trace gravel 6.0 | | | | | | | |
| | | Hard Brown Sandy Clay with trace silt and gravel 8.0 | | S-03 | 8 8 10 | 18 | 10.0 | | 9000* |
| 881.0 | | Compact Brown Clayey Sand with trace silt and gravel 10.0 | 10 | S-04 | 12 20 21 | 41 | | | |
| | | End of Boring @ 10 ft | | | | | | | |
| 876.0 | | | 15 | | | | | | |
| 871.0 | | | 20 | | | | | | |
| 866.0 | | | 25 | | | | | | |
| 861.0 | | | 30 | | | | | | |

Total Depth: 10 ft
Drilling Date: December 2, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
Dry during drilling operations; dry cave at 9-1/2 feet after auger removal

Notes:
Borehole collapsed at 9-1/2 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 32

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.31952° Longitude: -83.89623°

# Soil Boring No. B-33

CONSULTING GROUP

## SUBSURFACE PROFILE

## SOIL SAMPLE DATA

| ELEV. ( ft) | PRO-FILE | GROUND SURFACE ELEVATION: 887.0 ft | DEPTH ( ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil: Dark Brown Clayey Sand (7 inches) 0.6 | | | | | | | |
| | | Fill: Medium Compact Brown Clayey Sand with trace silt; occasional silty sand layers | | S-01 | 7<br>8<br>7 | 15 | | | |
| | | 3.0 | | | | | | | |
| 882.0 | | Very Stiff Brown Sandy Clay with trace silt and gravel; hydrocarbon odor | 5 | S-02 | 4<br>4<br>9 | 13 | 10.7 | | 7000* |
| | | 6.0 | | | | | | | |
| | | Very Stiff Reddish Brown Sandy Clay with trace silt and gravel | | S-03 | 2<br>4<br>5 | 9 | 19.1 | | 5000* |
| | | 9.0 | | | | | | | |
| 877.0 | | Medium Compact Brown Sand with trace silt and gravel 10.0 | 10 | S-04 | 1<br>7<br>10 | 17 | | | |
| | | End of Boring @ 10 ft | | | | | | | |
| 872.0 | | | 15 | | | | | | |
| 867.0 | | | 20 | | | | | | |
| 862.0 | | | 25 | | | | | | |
| 857.0 | | | 30 | | | | | | |

Total Depth: 10 ft
Drilling Date: December 4, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
Dry during drilling operations; dry cave at 8-1/2 feet after auger removal

Notes:
Borehole collapsed at 8-1/2 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 33

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.31992° Longitude: -83.89621°

# Soil Boring No. B-34

CONSULTING GROUP

## SUBSURFACE PROFILE

## SOIL SAMPLE DATA

| ELEV. ( ft) | PRO-FILE | GROUND SURFACE ELEVATION: 883.0 ft | DEPTH ( ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil: Dark Brown Sandy Clay (6 inches) 0.5 | | | | | | | |
| | | Very Stiff Brown Sandy Clay with trace silt and gravel | | S-01 | 4 4 3 | 7 | 16.9 | | 5000* |
| | | 3.8 | | | | | | | |
| 878.0 | | Loose Brown Silty Sand with trace gravel | 5 | S-02 | 3 3 2 | 5 | | | |
| | | 6.0 | | | | | | | |
| | | Medium Compact Brown Clayey Sand with trace silt and gravel | | S-03 | 5 7 10 | 17 | | | |
| 873.0 | | 10.0 | 10 | S-04 | 8 12 10 | 22 | | | |
| | | End of Boring @ 10 ft | | | | | | | |
| 868.0 | | | 15 | | | | | | |
| 863.0 | | | 20 | | | | | | |
| 858.0 | | | 25 | | | | | | |
| 853.0 | | | 30 | | | | | | |

Total Depth: 10 ft
Drilling Date: December 4, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
Dry during drilling operations; dry cave at 7-1/2 feet after auger removal

Notes:
Borehole collapsed at 7-1/2 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 34

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.32027° Longitude: -83.89586°

# Soil Boring No. B-35

CONSULTING GROUP

## SUBSURFACE PROFILE

## SOIL SAMPLE DATA

| ELEV. (ft) | PRO-FILE | GROUND SURFACE ELEVATION: 865.0 ft | DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil: Dark Brown Silty Sand (6 inches) 0.5 | | | | | | | |
| | | Medium Compact Brown Silty Sand with trace gravel | | S-01 | 10<br>10<br>12 | 22 | | | |
| | | 3.5 | | | | | | | |
| 860.0 | | Medium Brown Sandy Clay with trace silt and gravel | 5 | S-02 | 4<br>3<br>4 | 7 | 11.5 | | 1500* |
| | | 6.0 | | | | | | | |
| | | Very Stiff Brown Silty Clay with trace sand and gravel | | S-03 | 6<br>12<br>10 | 22 | 12.2 | | 6000* |
| | | 8.5 | | | | | | | |
| 855.0 | | Stiff Brown Sandy Clay with trace silt and gravel 10.0 | 10 | S-04 | 5<br>6<br>9 | 15 | 10.9 | | 3000* |
| | | End of Boring @ 10 ft | | | | | | | |
| 850.0 | | | 15 | | | | | | |
| 845.0 | | | 20 | | | | | | |
| 840.0 | | | 25 | | | | | | |
| 835.0 | | | 30 | | | | | | |

Total Depth: 10 ft
Drilling Date: December 4, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
Dry during drilling operations; dry cave at 8-3/4 feet after auger removal

Notes:
Borehole collapsed at 9 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 35

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.32640° Longitude: -83.89043°

# Soil Boring No. B-36

CONSULTING GROUP

## SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: N/A

- Crushed Limestone Aggregate: Gray Gravelly Sand with trace silt — 0.0 to 2.0
- Medium Compact Brown Silty Sand with trace gravel — 2.0 to 3.5
- Loose to Medium Compact Brown Sand with trace silt and gravel — 3.5 to 8.5
- Hard Gray Silty Clay with trace sand and gravel — 8.5 to 12.5
- Hard Gray Sandy Clay with trace silt and gravel (Hardpan) — 12.5 to 30.0

## SOIL SAMPLE DATA

| DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|
| 0 | S-01 | 8 6 7 | 13 | | | |
| 5 | S-02 | 2 3 3 | 6 | | | |
| 5 | S-03 | 9 10 13 | 23 | | | |
| 10 | S-04 | 6 11 18 | 29 | 8.7 | | 9000* |
| 15 | S-05 | 3 8 50/3" | --- | 7.8 | | 9000* |
| 20 | S-06 | 14 50/5" | --- | 7.9 | | 9000* |
| 25 | S-07 | 100/4" | --- | 11.0 | | |
| 30 | S-08 | 61 50/3" | --- | 8.3 | | 9000* |

Total Depth: 30 ft End of Boring @ 30 ft
Drilling Date: December 8, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
5 feet during drilling operations; wet cave at 15 feet after auger removal

Notes:
Borehole collapsed at 15 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 36

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.32583° Longitude: -83.89041°

# Soil Boring No. B-37

CONSULTING GROUP

## SUBSURFACE PROFILE

## SOIL SAMPLE DATA

| DEPTH (ft) | PRO-FILE | GROUND SURFACE ELEVATION: N/A | DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|---|---|---|
| | | Crushed Limestone Aggregate: Gray Gravelly Sand with trace silt — 1.0 | | | | | | | |
| | | Fill: Loose Brown Silty Sand — 2.3 | | S-01 | 5<br>4<br>4 | 8 | | | |
| 5 | | Fill: Loose Very Dark Brown Silty Sand (Organic Matter Content = 6.5%) — 4.8 | 5 | S-02 | 3<br>2<br>3 | 5 | | | |
| | | | | S-03 | 2<br>4<br>6 | 10 | | | |
| 10 | | Very Loose to Loose Brown Sand with trace silt and gravel | 10 | S-04 | 3<br>1<br>2 | 3 | | | |
| | | — 13.5 | | S-05 | 20<br>26<br>34 | 60 | 8.8 | | 9000* |
| 15 | | | 15 | | | | | | |
| | | Hard Gray Silty Clay with trace sand and gravel; occasional cobbles | | S-06 | 25<br>38<br>50/6" | --- | 7.7 | | 9000* |
| 20 | | | 20 | | | | | | |
| | | — 22.5 | | S-07 | 25<br>44<br>50/2" | --- | 9.2 | | 9000* |
| 25 | | (Poor recovery @ S-07) Hard to Very Hard Gray Sandy Clay with trace silt and gravel (Hardpan) | 25 | | | | | | |
| | | — 30.0 | | S-08 | 31<br>50/5" | --- | 11.1 | | 9000* |
| 30 | | | 30 | | | | | | |

Total Depth: 30 ft End of Boring @ 30 ft
Drilling Date: December 8, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
7 feet during drilling operations; wet cave at 6 feet after auger removal

Notes:
Borehole collapsed at 6 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 37

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/7/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.32643° Longitude: -83.88910°

# Soil Boring No. B-38

CONSULTING GROUP

## SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: N/A

- 0.0 – 0.6: Topsoil: Dark Brown Silty Sand (7 inches)
- 0.6 – 3.0: Fill: Medium Compact Brown Sand with trace silt and gravel
- 3.0 – 6.0: Fill: Medium Compact Gray and Brown Silty Sand; occasional clay clods
- 6.0 – 30.0: Hard Gray Sandy Clay with trace gravel
  - (Poor recovery @ S-05)

## SOIL SAMPLE DATA

| DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|
| | S-01 | 6 6 8 | 14 | | | |
| 5 | S-02 | 5 8 9 | 17 | | | |
| | S-03 | 4 8 15 | 23 | 8.6 | | 9000* |
| 10 | S-04 | 6 13 40 | 53 | 7.1 | | 9000* |
| 15 | S-05 | 20 25 27 | 52 | | | |
| 20 | S-06 | 17 26 32 | 58 | 8.8 | | 9000* |
| 25 | S-07 | 21 20 33 | 53 | 7.2 | | |
| 30 | S-08 | 30 33 39 | 72 | 7.0 | | |

Total Depth: 30 ft End of Boring @ 30 ft
Drilling Date: December 4, 2025
Inspector:
Contractor: 2G Drilling
Driller: A. Guzdzial

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
5 feet during drilling operations; wet cave at 29 feet after auger removal

Notes:
Borehole collapsed at 29 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 38

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/9/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.32586° Longitude: -83.88908°

# Soil Boring No. B-39

CONSULTING GROUP

## SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: N/A

Loose Reddish Brown Silty Sand

6.5

Loose Brown Sand with trace silt

8.5

Very Stiff Brown Sandy Clay with trace silt and gravel

13.0

Hard to Very Hard Gray Sandy Clay with trace silt and gravel; occasional cobbles

## SOIL SAMPLE DATA

| DEPTH (ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
|---|---|---|---|---|---|---|
| | S-01 | 5<br>4<br>3 | 7 | | | |
| 5 | S-02 | 3<br>3<br>4 | 7 | | | |
| | S-03 | 3<br>3<br>5 | 8 | | | |
| 10 | S-04 | 9<br>14<br>16 | 30 | 12.9 | | 4000* |
| 15 | S-05 | 13<br>26<br>35 | 61 | 9.6 | | 9000* |
| 20 | S-06 | 27<br>33<br>36 | 69 | 8.5 | | 9000* |
| 25 | S-07 | 55<br>50/5" | --- | 9.1 | | 9000* |
| 30 | S-08 | 19<br>31<br>42 | 73 | 6.6 | | 9000* |

Total Depth: 35 ft
Drilling Date: December 8, 2025
Inspector:
Contractor: 2G Drilling
Driller: Brendan

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

Water Level Observation:
6-1/2 feet during drilling; dry cave at 11 feet after auger removal

Notes:
Borehole collapsed at 11 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 39a

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/9/26

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No. 253566

Latitude: 42.32586° Longitude: -83.88908°

# Soil Boring No. B-39

CONSULTING GROUP

| SUBSURFACE PROFILE | | | | SOIL SAMPLE DATA | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| DEPTH ( ft) | PRO-FILE | GROUND SURFACE ELEVATION: N/A | DEPTH ( ft) | SAMPLE TYPE-NO. | BLOWS/ 6-INCHES | STD. PEN. RESISTANCE (N) | MOISTURE CONTENT (%) | DRY DENSITY (PCF) | UNCONF. COMP. STR. (PSF) |
| | | Hard to Very Hard Gray Sandy Clay with trace silt and gravel; occasional cobbles *(continued)* | | | | | | | |
| 35 | | 34.5<br>Very Compact Gray Gravelly Sand with trace silt<br>35.0 | 35 | S-09 | 9<br>27<br>50/3" | --- | 8.1 | | 9000* |
| | | End of Boring @ 35 ft | | | | | | | |
| 40 | | | 40 | | | | | | |
| 45 | | | 45 | | | | | | |
| 50 | | | 50 | | | | | | |
| 55 | | | 55 | | | | | | |
| 60 | | | 60 | | | | | | |

Total Depth: 35 ft
Drilling Date: December 8, 2025
Inspector:
Contractor: 2G Drilling
Driller: Brendan

Drilling Method:
2-1/4-inch inside-diameter hollow-stem augers

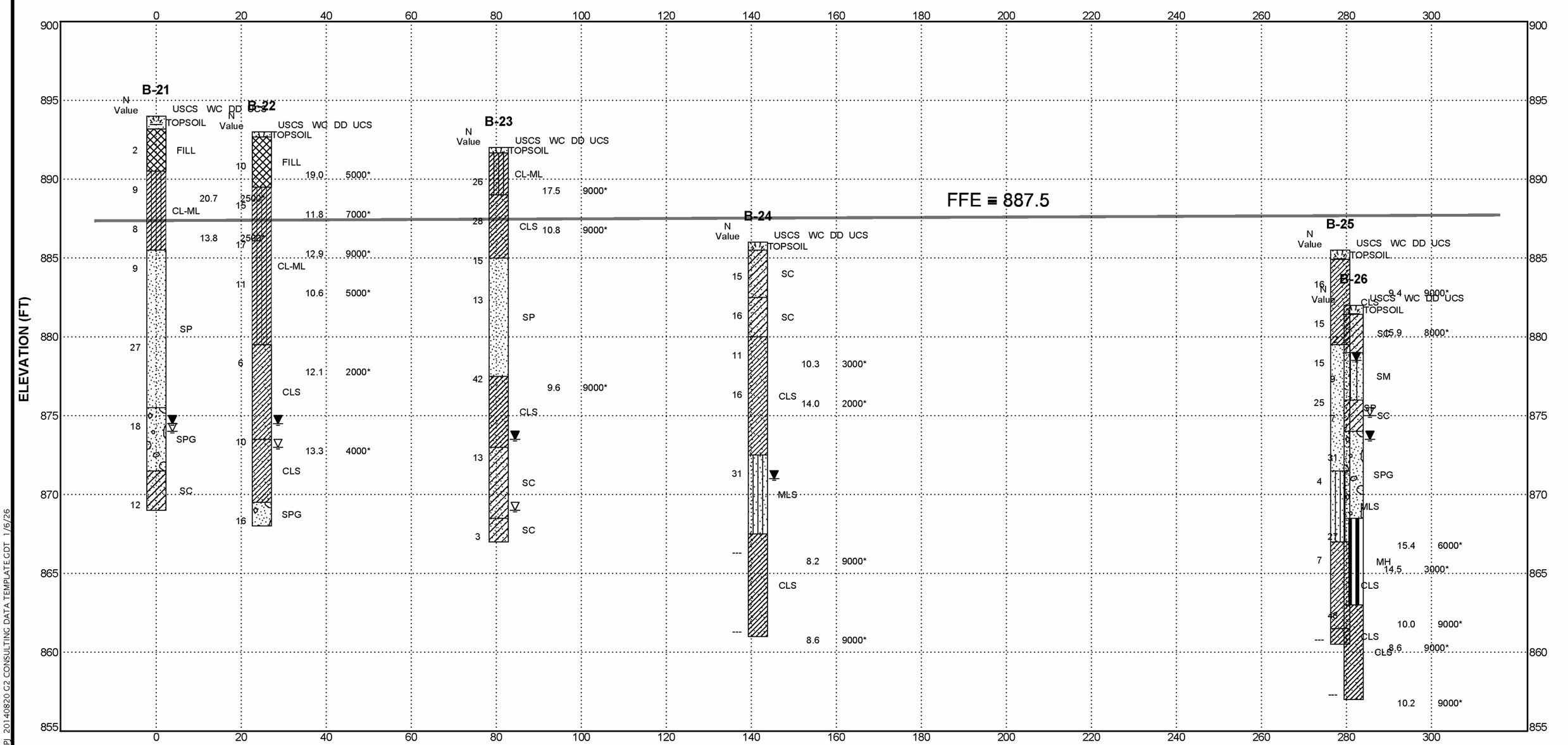
Water Level Observation:
6-1/2 feet during drilling; dry cave at 11 feet after auger removal

Notes:
Borehole collapsed at 11 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 39b

SOIL / PAVEMENT BORING 253566.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 1/9/26




## Legend

- ▽ Encountered Groundwater Level
- ▼ Groundwater Level at Completion

G2 CONSULTING GROUP

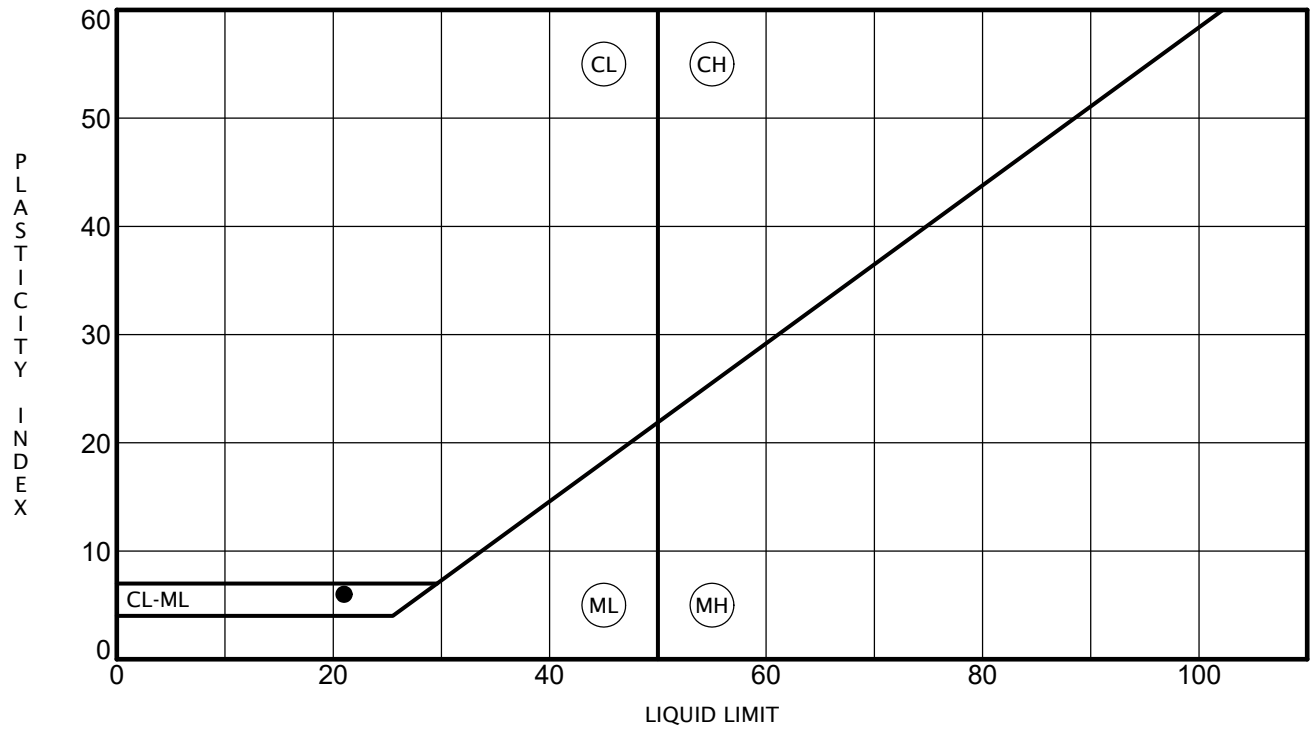
# SOIL BORING PROFILE A-A'

Project Name: Dexter Schools 2025 Bond Program - Dexter
Project Location: Fieldhouse & Al Ritt Stadium Improvements
Dexter, Michigan

G2 Project No.: 253566

Figure No. 40

SOIL BORING PROFILE WITH WATER LEVELS 253566.GPJ 20140820 G2 CONSULTING DATA TEMPLATE.GDT 1/6/26




| | Specimen Identification | | LL | PL | PI | Fines | M % | Classification |
|---|---|---|---|---|---|---|---|---|
| ● | B-32 | S-01 | 21 | 15 | 6 | | 12 | Brown Silty Clay |

CONSULTING GROUP

# ATTERBERG LIMITS RESULTS

Project Name: Dexter Schools 2025 Bond Program - Dexter Fieldhouse & Al Ritt Stadium Improvements

Project Location: Dexter, Michigan

G2 Project No.: 253566

Figure No. 41

US_ATTERBERG_LIMITS 253566.GPJ 20140820 G2 CONSULTING DATA TEMPLATE.GDT 1/6/26

# GENERAL NOTES TERMINOLOGY

Unless otherwise noted, all terms herein refer to the Standard Definitions presented in ASTM D 653.

## PARTICLE SIZE

| | | |
|---|---|---|
| Boulders | | - greater than 12 inches |
| Cobbles | | - 3 inches to 12 inches |
| Gravel | - Coarse | - 3/4 inches to 3 inches |
| | - Fine | - No. 4 to 3/4 inches |
| Sand | - Coarse | - No. 10 to No. 4 |
| | - Medium | - No. 40 to No. 10 |
| | - Fine | - No. 200 to No. 40 |
| Silt | | - 0.005mm to 0.074mm |
| Clay | | - Less than 0.005mm |

## CLASSIFICATION

The major soil constituent is the principal noun, i.e. clay, silt, sand, gravel. The second major soil constituent and other minor constituents are reported as follows:

| **Second Major Constituent (percent by weight)** | **Minor Constituent (percent by weight)** |
|---|---|
| Trace - 1 to 12% | Trace - 1 to 12% |
| Adjective - 12 to 35% | Little - 12 to 23% |
| And - over 35% | Some - 23 to 33% |

## COHESIVE SOILS

If clay content is sufficient so that clay dominates soil properties, clay becomes the principal noun with the other major soil constituent as modifier, i.e. sandy clay. Other minor soil constituents may be included in accordance with the classification breakdown for cohesionless soils, i.e. silty clay, trace sand, little gravel.

| **Consistency** | **Unconfined Compressive Strength (psf)** | **Approximate Range of (N)** |
|---|---|---|
| Very Soft | Below 500 | 0 - 2 |
| Soft | 500 - 1,000 | 3 - 4 |
| Medium | 1,000 - 2,000 | 5 - 8 |
| Stiff | 2,000 - 4,000 | 9 - 15 |
| Very Stiff | 4,000 - 8,000 | 16 - 30 |
| Hard | 8,000 - 16,000 | 31 - 50 |
| Very Hard | Over 16,000 | Over 50 |

Consistency of cohesive soils is based upon an evaluation of the observed resistance to deformation under load and not upon the Standard Penetration Resistance (N).

## COHESIONLESS SOILS

| **Density Classification** | **Relative Density %** | **Approximate Range of (N)** |
|---|---|---|
| Very Loose | 0 - 15 | 0 - 4 |
| Loose | 16 - 35 | 5 - 10 |
| Medium Compact | 36 - 65 | 11 - 30 |
| Compact | 66 - 85 | 31 - 50 |
| Very Compact | 86 - 100 | Over 50 |

Relative Density of cohesionless soils is based upon the evaluation of the Standard Penetration Resistance (N), modified as required for depth effects, sampling effects, et

## SAMPLE DESIGNATIONS

AS - Auger Sample – Cuttings directly from auger flight
BS - Bottle or Bag Samples
S - Split Spoon Sample - ASTM D 1586
LS - Liner Sample with liner insert 3 inches in length
ST - Shelby Tube sample - 3 inch diameter unless otherwise noted
PS - Piston Sample - 3 inch diameter unless otherwise noted
RC - Rock Core - NX core unless otherwise noted

STANDARD PENETRATION TEST (ASTM D 1586) - A 2.0 inch outside-diameter, 1-3/8 inch inside-diameter split barrel sampler is driven into undisturbed soil by means of a 140-pound weight falling freely through a vertical distance of 30 inches. The sampler is normally driven three successive 6-inch increments. The total number of blows required for the final 12 inches of penetration is the Standard Penetration Resistance (N).