Troy School District

Early Childhood Center

BP#4 Playground & Signage

PROJECT MANUAL

Issued: December 3, 2018

Barton Malow

TMP ARCHITECTURE

SECTION 00010
PROJECT MANUAL
TABLE OF CONTENTS

OTHER DOCUMENTS ISSUED FOR BID PACKAGE NUMBER

- Division 0 Conditions of The Contract and Division 1 General Requirements are found in the Project Manual, included herein
- Project Manual issued by Barton Malow Company dated December 3, 2018.
- TMP Associates Technical Specifications dated November 30, 2018.
- TMP Associates Drawings dated November 30, 2018.

SECTION 00015
Listing of Drawings

LIST OF DRAWINGS

See Title Sheet TS.1

SECTION 00030
PROJECT MANUAL
INFORMATION AND IDENTITIES

This Project Manual has been prepared by CM and contains the Bidding and Contract Requirements for **Troy School District** – **Early Childhood Center** project in **Troy, MI**

PROJECT:	**Troy School District** **Early Childhood Center** **BP#4 – Playground & Signage**
CONSTRUCTION MANAGER: **(Direct all Questions to CM)**	**Barton Malow Company** **1140 Rankin Drive** **Troy, MI 48083** **Christa Amalio** **Phone: 586.295.1412** **Email: Christa.Amalio@bartonmalow.com**
OWNER:	**Troy School District** **1140 Rankin** **Troy, MI 48083**
ARCHITECT:	**TMP Architecture** **1191 W. Square Lake Road** **Bloomfield Hills, MI 48302** **Phone: (248) 338-4561**

SECTION 00100
ADVERTISEMENT TO BID

Troy School District requests Bid Proposals for Troy Early Childhood Center BP#3. Bid Proposals will be received electronically through Building Connected on Tuesday December 18th at 10:00 AM EST. All Proposals shall be submitted through Building Connected, for instructions on how to submit a bid please follow this link: https://buildingconnected-community.force.com/s/article/How-to-submit-your-bid-directly-through-BuildingConnected

1. Proposals shall be based on the requirements set forth in the Project Manual by Barton Malow Company dated December 3, 2018; the bid set drawings issued by TMP Architecture on November 30, 2018 and the specifications manual dated November 30, 2018.

2. Link to the Barton Malow Public Planroom:
https://app.buildingconnected.com/public/55a1292ff1a96708004a19dc

3. Accepted Bidders will be required, as a condition precedent to award of Contract, to furnish in the amount of 100% of the contract price, satisfactory Performance Bond and Payment Bond and Certificates of Insurance as required in the Project Manual.

4. Unless otherwise specifically set forth in Section 00880 of the Project Manual, this Project is subject to state sales and/or use taxes and Bidder is required to include such taxes in its Bid Proposal.

5. Barton Malow Company has been contracted by the Owner in the capacity of Construction Manager for the Project, and as such has the rights and obligations set forth in its contract with the Owner for those services, and shall act as representative of the Owner to the extent required/allowed under its Owner contract.

6. Bid Proposals will be publicly opened Tuesday December 18th at 10:00 AM EST, evaluated by the Owner and Barton Malow Company, Owner and the Architect, with recommended awards subsequently made by Barton Malow Company. The Owner shall not open, consider, or accept a Bid Proposal that is received after the date and time specified for bid submission in this Advertisement for Bids.

7. No pre-bid conference or walk through will be held. Barton Malow Company can be contacted to visit the site.

8. Bid Proposals shall be submitted through Building Connected. Bidders will be required to submit with their Bid Proposals a Bid Security by a qualified surety authorized to do business in the state where the Project is located, an OSHA Form 300 for the most recent completed year, their worker's compensation Experience Modification Rate (EMR) factor, familial disclosure form, iran sanctions form, and any other information required in the Instructions to Bidders. Bidders shall not withdraw Bid Proposals for a period of Sixty (60) Days after date for receipt of Bid Proposals.

9. The successful Bidder(s) will be required to enter into an agreement with **Owner** on the Agreement Form identified in Section 00500 of the Project Manual.

10. The right to reject any or all Bid Proposals, either in whole or in part, or to waive any informalities or irregularities therein is reserved by the Owner**.**

11. All Bid Proposals shall be accompanied by the sworn statement included in Section 00410 of the Project Manual, in accordance with MCL 380.1267, disclosing any familial relationship that exists between the owner(s) or any employee of the Bidder and any member of the board of trustees. Bid Proposals that do not include this sworn and notarized disclosure statement shall not be accepted.

BARTON MALOW COMPANY

END OF SECTION 00100

SECTION 00200
INSTRUCTION TO BIDDERS

1. BIDDING PROCEDURE

1.1. FORM AND STYLE OF BIDS

1.1.1. Bid Proposals shall be submitted using Building Connected.

1.2. BID SECURITY

1.2.1. Bid security in the form of a bid bond issued by a qualified surety, certified check or cashier's check in the amount of five percent (5%) of the Base Bid amount will be required at the time of submission of the Bid Proposal. Bid bonds shall be duly executed by the Bidder, as principal and by a surety that is properly licensed and authorized to do business in the state in which the Work is to be performed. All sureties providing bonds for this Project must be listed in the latest version of the Department of Treasury's Circular 570, entitled "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies", with the bond amount less than or equal to the underwriting limitation, and/or have an A.M. best rating of A- or better.

1.2.2. Bid bond shall pledge that the Bidder, with the understanding that if its Bid Proposal is accepted, will enter into the Agreement with the Troy School District for any of the Bid Category(ies) accepted from its Bid Proposal and will, if required, furnish performance and payment bonds covering the faithful performance of the Agreement and the payment of all obligations arising there under. The attorney-in-fact, who signs the surety bond must submit along with the bond, a certified and effectively dated copy of his/her power of attorney.

1.2.3. Bid bond form AIA Document A310 unmodified, is approved for use on this Project.

1.2.4. The bid security obligees shall be Troy School District and the amount of the bid security shall become its property in the event that the Bidder fails, within fifteen days of notice of award or receipt of the Agreement form, to execute the Agreement, and deliver the performance and payment bonds as described in the Project Manual, section 00610. In such case, the bid security shall be forfeited to the Troy School District as liquidated damages, not as a penalty.

1.2.5. The Owner will have the right to retain the bid security(ies) of Bidders to whom an award is being considered until either (a) the Agreement has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bid Proposals may be withdrawn, or (c) all Bid Proposals have been rejected.

1.2.6. Bid security will be returned to the successful Bidders after the Agreement has been executed, and acceptance of required performance and payment bonds. The bid security of Bidders that are not under consideration for award of the Agreement will be returned to those Bidders.

1.3. SUBMISSION OF BIDS

1.3.1. All Barton Malow K-12 and Community College projects can be bid electronically. Visit the Barton Malow planroom to see all of our projects out for bid. Please contact the Barton Malow project teams for additional information.

1.4. MODIFICATION OR WITHDRAWAL OF BID PROPOSAL

1.4.1. With electronic sealed bidding, you can ensure that all bids are kept confidential until the bid due date and time. Subcontractors will be able to submit and revise their bids right up to the bid due date and time, but no revisions or new bids will be accepted after the deadline has passed. Click here for additional information on electronic sealed bidding.

1.5. OPENING OF BIDS

1.5.1. Bid Proposals received on time will be opened publicly

1.5.1.1. Bid Proposals shall be held open and irrevocable for forty five (45) days after the date for receipt of bids.

1.6. REJECTION OF BIDS

1.6.1. The Troy School District reserves the right to reject any or all Bid Proposals in accordance with all applicable laws.

1.7. ACCEPTANCE OF BID (AWARD)

1.7.1. It is the intent of the Troy School District to award the Agreement to the Lowest Responsive and Responsible Bidder in accordance with the Bidding Documents. The Troy School District shall have the right to waive any informality or irregularity in any Bid Proposal received and to accept Bid Proposals which, in its judgment, are in its own best interest.

1.7.2. The Troy School District shall have the right to accept Alternates in any order or combination and to determine the low Bidder on the basis of the sum of the Base Bid, Voluntary Alternates and Alternates accepted.

2. DEFINITIONS

2.1. Capitalized terms used in this Project Manual shall have the meanings set forth below. If a capitalized term is used herein but not defined in this Section, 00200, Part 1, it shall have the meaning set forth in the Contract Documents.

2.2. "**Addenda**" means the written and graphic instruments issued by the Architect and/or CM prior to the execution of the Agreement that modify or interpret the Bidding Documents by additions, deletions, clarifications, or corrections.

2.3. "**Agreement**" means the document defined in the Project Manual, including all other documents incorporated by reference in the Agreement.

2.4. "**An Alternate Bid**" (or "**Alternate**") is an amount stated in the Bid Proposal to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

2.5. "**Architect**" means the person or entity listed in section 00030 of the Project Manual and may include professional engineers if so designated.

2.6. "**Base Bid**" is the sum stated in the Bid Proposal for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added to or deducted from for sums stated in Alternate Bids.

2.7. A "**Bidder**" is a person or legal entity that submits a Bid Proposal in conformance with the Bidding Documents. After award of the Agreement, the Bidder will be referred to as Contractor. All Contractors on this project are considered prime/principal contractors.

2.8. "**Bid Categories**" are units of Work performed by a Contractor and its Subordinate Parties which form part of the total Project. The term "Bid Category" should not be confused with the term "**Technical Section**". Technical Sections of the Specification establish quality and performance criteria, and the Bid Categories designate work scope and assignment.

2.9. "**Bidding Documents**" means the Bidding Requirements, the Contract Documents, and the Reference Documents collectively.

2.10. A "**Bid Package**" means a series of Bid Categories that are released for bidding in the same set of Bidding Documents.

2.11. "**Bidding Requirements**" include the Advertisement to Bid, Instructions to Bidders, Information Available to Bidders, and Bid forms and supplements.

2.12. "**Bid Proposal**" is a complete and properly signed proposal to do the Work of an individual Bid Category(ies) for the sums stipulated therein, submitted in accordance with the Bidding Documents.

2.13. The "**Contract Documents**" consist of all Contracting Requirements set forth in the Project Manual, including, but not limited to, the Contract Forms (the Agreement, Performance/Payment Bonds, and Certificates), the Conditions of the Contract (General, Supplementary or Special), the General

Requirements of the Project Manual, the Technical Specifications, Drawings, and all other documents incorporated into the Agreement by reference, all Addenda issued prior to and all modifications issued after execution of the Agreement.

2.14. **"Contractor"** means the entity to which the Owner issues a contract for performance of the Work.

2.15. "**Day**" means calendar day, unless otherwise defined in the particular Contract Document.

2.16. "**Hazard Communications Program**" means Contractor's own hazard communications program that will govern project safety for its Work. The Hazard Communications Program must be submitted to CM by each successful Bidder before commencing Work and be no less stringent than Section 00810 - On Site Safety and Loss Control Program.

2.17. "**Hazardous Materials**" means asbestos; asbestos containing material; lead (including lead-based paint); PCB; molds; any other chemical, material, or substance subject to regulation as a hazardous material, hazardous substance, toxic substance, or otherwise, under applicable federal, state, or local law; and any other chemical, material, or substance that may have adverse effects on human health or the environment.

2.18. "**Lowest Responsive, Responsible Bidder**" means a Bidder Who's Bid Proposal conforms in all material aspects to the terms, conditions, specifications and requirements of the solicitations and who has demonstrated the ability to properly perform the Work.

2.19. "**MBE/WBE/SBE**" means Minority Owned Business Enterprise/Women Owned Business Enterprise/ Small Business Enterprise as these terms are defined in the applicable ordinances and laws governing the Project.

2.20. "**Project Safety Program**" means the Contractor's site safety program that will govern project safety for its Work. The Project Safety Program must be submitted to CM by each successful Bidder before commencing Work and be no less stringent than Section 00810 - On Site Safety and Loss Control Program.

2.21. "**Reference Documents**" are drawings that do not form a part of the Contract Documents and are included in the Bidding Documents as a courtesy only. The Bidder is not entitled to rely upon the accuracy of the Resource Drawings and they are not warranted to be correct or reliable by the Owner or CM. The Bidder is expected to have conducted its own investigation into the reliability or accuracy of any Reference Documents, and no adjustment to the Base Bid shall be made if such request arises or results from the Bidder's failure to conduct such investigation.

2.22. "**Subordinate Parties**" means all of Contractor's employees, workers, laborers, agents, consultants, suppliers or subcontractors, at any tier, who perform, assist with, or otherwise are involved in any of the Work.

2.23. A "**Unit Price**" is an amount stated in the Bid Proposal as a price per unit of measurement for materials or services as described in the Bidding Documents or in the proposed Contract Documents.

2.24. The "**Work**" includes all work and responsibilities performed or to be performed by Contractor under the Subcontract.

3. PART 2 - BIDDERS REPRESENTATIONS

3.1.1. The Owner reserves the right to request qualification forms or additional information from any Bidder before issuing documents, receiving Bid Proposals or awarding an Agreement. The Owner may, at their sole discretion, accept or reject Bidders as qualified. The right to waive any informalities or irregularities in qualification materials is reserved by the Owner.

3.2. BIDDER BY MAKING ITS BID REPRESENTS THAT:

3.2.1. Bidder has carefully read, reviewed and understands the Bidding Documents and its Bid Proposal is made in accordance therewith.

3.2.2. Bidder's Bid Proposal is based upon the materials, systems, equipment, terms and conditions required by the Bidding Documents without exception.

3.2.3. Bidder certifies that it:

3.2.3.1. has examined the Project site;

3.2.3.2. has carefully reviewed the Bidding Documents

3.2.3.3. has compared its examination of the Project site with the Bidding Documents;

3.2.3.4. is satisfied as to the condition of the Project site, any surface or subsurface obstruction, the actual levels, and all excavating, filling in, removal and demolition, measurements and quantities involved in the Work;

3.2.3.5. is familiar with weather conditions of the Project area;

3.2.3.6. has taken account of all of these factors in preparing and presenting its Bid Proposal.

3.2.4. Bidder further certifies that it

3.2.4.1. has fully acquainted itself with the character and extent of the Owner's, CM's and other Contractor 's operations in the area of the Work

3.2.4.2. has taken account of coordination of operations of others in its construction plans set forth in the Bid Proposal.

3.2.5. No change orders will be issued to the Contractor for or on account of costs or expenses occasioned by its failure to comply with the provisions of this paragraph, or by reason of error or oversight on the part of the Contractor, or on account of interferences by the Owner's, CM's or other contractor's activities.

3.2.6. The Bidder, by submitting its Bid Proposal, represents that it has carefully reviewed the project schedule, along with the related requirements of the Project's Schedule and Phasing, and acknowledges that these are acceptable and have been taken into account in preparing its Bid Proposal.

4. BIDDING DOCUMENTS

4.1. COPIES

4.1.1. Bidders shall use complete sets of Bidding Documents in preparing Bid Proposals. Neither the Owner, CM nor the Architect shall be responsible for errors, omissions or misinterpretations resulting from the Bidder's use of partial sets of Bidding Documents.

4.1.2. Copies of the Bidding Documents are being made available for the purpose of obtaining Bid Proposals for the Work only. Bidders shall not use the Bidding Documents for any other purpose. Neither the Owner, CM nor the Architect warrants the completeness and/or adequacy of the Bidding Documents.

4.2. INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

4.2.1. Bidder shall promptly notify the Barton Malow Company of all ambiguities, inconsistencies, or errors that it may discover upon examination of the Bidding Documents or upon examination of the Project site and local conditions. Bidders requesting clarification or interpretation of the Bidding Documents shall make a written request, which shall reach Barton Malow Company at least 5 days prior to the date for receipt of Bid Proposals. Direct all questions to:

Contact Name: Christa Amalio
Address: 1140 Rankin
City, State, Zip: Troy**,** MI**,** 48098
Phone: 586.295.1412
Email: Christa.Amalio@bartonmalow.com

4.2.2. Any interpretation, correction, or change of the Bidding Documents will be made by Addendum and/or Bid Clarification. Interpretations, corrections, or changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon such interpretations, corrections and changes. Advertisement to Bid

4.3. ADDENDA and/or BID CLARIFICATIONS

4.3.1. Addenda and/or Bid Clarifications will be distributed to all who are known by CM to have received a complete set of Bidding Documents. Copies of Addenda and/or Bid Clarifications will be made available for inspection wherever Bidding Documents are on file for that purpose.

4.3.2. No Addenda or Bid Clarifications will be issued later than 3 days prior to the date for receipt of Bids except an Addendum or Bid Clarification withdrawing or postponing the request for Bid Proposals.

4.4. ALTERNATES

4.4.1. Each Bidder must bid on all Alternates listed in the Bid Proposal that are applicable to its Bid Category. Alternates will be fully considered in awarding the Agreement.

4.4.2. The Owner shall be allowed a period of 90 Days after date of receipt of the Bid Proposals to exercise the right to accept or reject any or all Alternates submitted on the Bid Proposal.

4.4.3. Successful Bidders shall perform all Work required for complete execution of accepted Alternates, and the Bid Proposal shall include all overhead and profit for the Work required.

4.5. VOLUNTARY ALTERNATES

4.5.1. All Bid Proposals must be based upon the Bidding Documents. In addition to a Base Bid Proposal, the submission of Voluntary Alternates is acceptable and encouraged. If a Voluntary Alternate is submitted for consideration, it shall be expressed on the Bid Form as an add or deduct amount from the Base Bid. The [Owner or Owner and CM] reserve the right to unilaterally accept or reject Voluntary Alternates and to determine if the Voluntary Alternates will be considered in the awarding of the Agreement.

4.6. UNIT PRICES

4.6.1. Each Bidder must bid on all Unit Prices listed in the Bid Proposal that are applicable to its Bid Category. Unit Prices will be fully considered in awarding the Agreement.

4.6.2. Successful Bidders shall perform all Work required for complete execution of accepted Unit Prices, and such Unit Prices shall include all overhead and profit for the Work required.

4.7. NO DISCRIMINATION

4.7.1. All Bidders shall ensure that employees and applicants for employment are not discriminated against because of their race, color, religion, sex, national origin, age, marital status, sexual orientation, or disability and in conformance with local, state and federal laws, regulations and ordinances.

4.7.2. In regard to any Agreement entered into pursuant to this Bid Package, minority and women owned business enterprises will be afforded full opportunity to submit Bid Proposals and will not be discriminated against on the grounds of race, color, religion, sex, national origin, age, marital status, sexual orientation, disability or any other status protected by applicable law.

4.8. To the extent that these Instructions to Bidders and applicable public bidding laws, rules, regulations or ordinances conflict with each other, the provisions of the applicable bidding laws, rules, regulations or ordinances shall govern.

4.9. The Owner expects all supplies, materials equipment or products proposed by a Bidder to meet or exceed the Specifications set forth in the Bidding Documents. Further, it is the Owner's intent that the Bidding Documents permit competition. Accordingly, the use of any patent, proprietary name or manufacturer's name is for demonstrative purposes only and is not intended to curtail competition. Whenever any supplies, material, equipment or products requested in the Bidding Documents are specified by patent, proprietary name or by the name of the manufacturer, unless stated differently, such specification shall be considered as if followed by the words "or comparable equivalent," whether or not such words appear. The Owner, in its sole and absolute discretion, shall have the right to determine if the proposed equivalent products/brands submitted by Bidder meet the Specifications contained in the Bidding Documents and possess equivalent and/or better qualities. It shall be the Bidder's responsibility to notify the Owner in

writing if any Specifications or suggested comparable equivalent products/brands require clarification by the Owner prior to the Due Date for Bid Proposals.

5. POST BID INFORMATION

5.1. POST BID INFORMATION

5.1.1. After the Bids are received, tabulated, and evaluated, the apparent low Bidders when so requested shall meet with CM at a post-bid meeting for the purposes of determining completeness of scope and any contract overlaps or omissions. If requested, the Bidder shall submit additional information as requested by CM. The Bidder will provide the following information at the post-bid meeting:

5.1.1.1. Designation of the Work to be performed by the Bidder with its own forces including manpower for the Contractor and that of its Subordinate Parties.

5.1.1.2. Detailed cost breakdown of the Bidder's Bid Proposal including labor, equipment and material unit prices.

5.1.1.3. A list of names of the Subordinate Parties proposed for the principal portions of the Work.

5.1.1.4. The proprietary names and suppliers of principal items or systems of materials and equipment proposed for the Work.

5.1.1.5. The names and backgrounds of the Bidder's key staff members including foremen and assistants. Bidder shall be requested to establish the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

5.1.1.6. Commitment to construction schedules, identification of items requiring long lead deliveries and manpower information in accordance with Section 00230 of the Project Manual.

5.1.1.7. Signed safety program compliance, as described in the Contract Documents

5.1.2. Prior to award of the Agreement, CM will notify the Bidder if either the Owner, the Architect, or CM, after due investigation, has reasonable objection to any proposed Subordinate Party. If the Owner, Architect or CM has reasonable objection to any proposed Subordinate Party, the Bidder may, at its option: (1) withdraw its Bid Proposal; or (2) submit an acceptable substitute Subordinate Party with an adjustment in its bid amount to cover the difference in cost occasioned by such substitution. The Troy School District, may, at its discretion, accept the adjusted bid amount or it may disqualify the Bidder. In the event of either withdrawal or disqualification under this Subparagraph, bid security will not be forfeited, notwithstanding the terms in the Instructions to Bidders.

5.1.3. Upon the Award of the Agreement, the Contractor shall submit to CM a complete list of all items, products, and layouts for which shop drawings, brochures, or samples are required; name of each Subordinate Party; and date of planned submission.

5.1.4. The Bidder will be required to establish to the satisfaction of CM, Owner and Architect, the reliability and responsibility of the Subordinate Parties proposed to furnish and perform the Work described in the Bidding Documents.

END OF SECTION 00200

SECTION 00210
DESCRIPTION OF THE WORK/SPECIAL PROVISIONS

1. GENERAL

1.1. RELATED DOCUMENTS

1.1.1. All Bidders shall review all of the Bidding Documents, all Bid Category Work descriptions and all Contract Documents, immediately advise CM of any adverse factors, conflicts or ambiguities that might affect the execution of Work of this Bid Package. Each Bidder is responsible to review all Bid Category descriptions and Contract Documents and coordinate the Work accordingly. Each Bidder shall incorporate into its Bid Proposal the cost of coordination of the Work with the requirements of all related Contract Documents, as shown, specified, or required.

1.1.2. Each Bidder shall thoroughly examine all of the Bidding Documents for the Work of all trades so as to familiarize itself both with the Work required under its Bid Category(ies) and with Work required under all other Bid Categories.

1.1.3. The Bidder shall perform all Work reasonably inferable from the Bidding Documents to produce the intended results. Bidders are required to visit and examine the Project site and may arrange the visit through CM.

1.1.4. A complete set of bid documents are available at CM's office

1.2. PROJECT DESCRIPTION

1.2.1. The scope of work includes new construction of a 72,000 sq. ft. preschool building. 26 classrooms, schools administration/office area, gross motor room, and kitchen. The exterior will include several parking lots, sidewalks and landscaping. Specific Bid Category/Work Scope descriptions are found in Section 00220.

1.3. SUMMARY OF THE BID CATEGORIES/WORK SCOPES

1.3.1. The following is a listing of Bid Categories for this project. All work relative to the Bid Package is identified on plans and specifications as prepared by the Architect. Each Bid Category description identifies the scope of Work to be performed by the Bidder as designated by CM.

BID CATEGORIES
101400 – Signage
116000 – Playground & Sitework

1.4. SPECIAL PROVISIONS

1.4.1. The following special provisions form a part of each Bid Category Work Scope and apply to each Contractor's Scope of Work found in Section 00220.

1.4.2. The Bid Category/Work Scopes should in no way be construed as being all inclusive. The Work Scope is issued as a guide to aid in the assignment of Work. If conflict regarding assignment of Work exists between the drawing notes and these descriptions, the Description of the Work and Bid Category/Work Scopes will take precedence. The Contractor shall carefully review and compare the Drawings and Specifications with the Work Scopes, and if a conflict exists, the Contractor shall immediately notify CM in writing. The Bid Category numbers and the specification section numbers are not, in all cases, identical.

1.4.3. Bidders are required to bid the entire Bid Category. Bids will only be accepted for individual Bid Categories. A Bidder may bid more than one Bid Category. Combined bids covering several Bid Categories will not be accepted, unless separate bid amounts are listed for each Bid Category making up the combined bid amount. Review the "Instructions to Bidders" in Section 00200 for specific Bid Proposal instructions.

1.4.4. Each Bidder shall review the schedule enclosed in the Bidding Documents, and be prepared to review at the post-bid meetings a schedule for the engineering, fabrication, delivery and installation of its Work. . This information will be considered in the award recommendation.

1.4.5. All Contractors are to coordinate all Work with the work of other trades for proper function and sequence (see Section 01360). Contractor must furnish approved copies of shop drawings, mock-ups, and technical data to other contractors designated by the CM for the purposes of coordination of this Work. Contractor must provide to all other trades all information (drawings, diagrams, templates, embedments) and other related Work necessary for the proper coordination of the Work of all trades. Each phase of the Work shall be coordinated, and the coordination plan approved by CM prior to proceeding. Contractor shall keep informed as to Work of all trades engaged in the Project, and shall execute Work in such a manner as not to delay or interfere with the progress of other trades involved. Contractor is required to schedule its Work so that no other party is delayed in execution of its work. Contractor is required to employ competent supervision on the Project throughout the entire period of construction to ensure proper coordination.

1.4.6. Contractor will furnish before any Work is started, evidence of ISO Certification or documented procedures for process control, including drawings, submittals, inspection/surveillance and training. In lieu of defined procedures, Contractor will follow CM's documented procedures for process control**.**

1.4.7. When it is necessary to modify or tie into existing utility services, Contractor shall notify CM in writing a minimum of 48 hours prior to the planned disruption. All disruptions shall be scheduled with CM and shall be kept to a minimum time. Tie-ins and shutdowns of existing utilities may have to be performed during off hours. Contractors are to include any required premium time in the Base Bid.

1.4.8. If Owner will occupy the premises or a portion of the premises during the construction, Contractor shall cooperate with CM and Owner in all construction operations to minimize conflict, and to facilitate Owner occupancy.

1.4.9. Information pertaining to the existing building has been obtained through photographs and investigations and is indicated on the Resource Drawings. This information is not warranted to be complete or accurate. Contractor shall verify all dimensions in the field prior to ordering materials or construction and any costs or expenses arising out of its failure to do so shall be borne solely by Contractor.

1.4.10. The Contractor shall examine the existing site conditions and carefully compare them to the Drawings. All measurements must be verified from actual observation at the Project site. The Contractor is responsible for all Work fitting in place in approved, satisfactory and workmanlike manner in every particular. If the Contractor encounters unexpected existing site or building conditions, it shall cease operations immediately to minimize damage and shall immediately notify CM in writing. Contractor shall bear all costs, expenses or damages arising or resulting from its failure to comply with this paragraph.

1.4.11. Hoisting of material or equipment above occupied areas will NOT be permitted unless the existing structure has been properly verified by a licensed professional Engineer to be able to bear the load of the material or equipment being hoisted if accidentally released. It is the responsibility of the Contractor performing such hoisting to properly and adequately reinforce existing structure.

1.4.12. Space for electrical and mechanical lines is limited for the Project. Therefore, it is imperative that Contractor coordinate its Work with the Work of all other trades to ensure containment of electrical and mechanical lines in space provided. Priority of space will be decided in discretion of CM, with no additional compensation, where unresolved conflict exists. If Work is not properly coordinated, Contractor shall remove and relocate Work without additional compensation.

1.4.13. The Contractor shall maintain all project record documents for all concealed Work to mark actual construction. The Contractor shall turn over to CM all project record documents upon completion of Work by the Contractor, in a format to be determined by CM. The Contractor shall make all project record documents available to the Owner, CM and/or the Architect for inspection and review. The Contractor's failure to maintain such documents adequately shall entitle the Owner and/or CM to withhold payment until such documents are current and up to date.

1.4.14. The Contractor shall submit a daily report to CM on a daily basis on the form provided to Contractor by CM.

1.4.15. All Contractors shall attend all meetings as required by CM.

1.5. OWNER EQUIPMENT COORDINATION

1.5.1. The Owner Furnished and Contractor Installed (OF/CI) equipment as listed in the Individual Contractor's Work scopes found in Section 00220 shows the Contractor responsible to schedule delivery, receive the equipment and accessories F.O.B. jobsite, inspect, protect, store, handle and move into position, provide all coordination with applicable trades for rough-in requirements and final connections, marshal the appropriate trades as a composite installation crew, and assist in initial startup.

1.5.2. Refer to the Drawings to determine quantities.

END OF SECTION 00210

BID CATEGORY 101400 Signage (Interior & Exterior)

The work of this bid category includes but is not limited to providing all labor, equipment, materials, scaffolding, hoisting and incidentals to complete the scope of work in accordance with the specifications, drawings and applicable codes. All work is to be performed as shown on the plans, described in the bid category work descriptions, project manuals and specified in the following technical specification sections:

Specification Section	Description of Section
DIVISION 3 – CONCRETE	
033000	Cast In Place Concrete
033010	Portland Cement Concrete
DIVISION 10 - SPECIALTIES	
101400	Interior Signage
101426	Exterior Signage
DIVISION 31 - EARTHWORK	
312000	Earthwork

In addition to the above, this bid category includes but is not limited to the Bidding Documents, the Bidding and Contract requirements and Division 1 General Requirements of the Project Manual and various other Technical Specifications interfacing with this work. **The bidder is advised to review the work descriptions of the other categories as well as their own so as to not misunderstand scope responsibilities.**

THE SCOPE OF THIS BID CATEGORY SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING ITEMS:

1. Each category shall be responsible for items of work as described in Section 00210 Descriptions of Work/Special Provisions/Requirements.

2. This contractor shall be responsible for all layout, engineering, elevations and layout coordination with other contractors. It is the responsibility of this contractor to layout all work of this category from established control lines. Upon completion of the work, furnish signed and sealed as-builts that tie all site improvements to property lines and/or building corners and meet the requirements of Section 01700 of the Project Manual.

3. This contractor shall include all overtime and shift time necessary to complete the work within the project schedule. Crew sizes shall be dependent on available work. Contractor will be required to work in multiple areas and at both sites, simultaneously and concurrently. See Special Instruction for additional overtime requirements.

4. Provide and install all items shown and specified in the bid documents including certifications and necessary permits.

5. This contractor is required to contact MISS DIG and existing sitework contractor to locate existing utilities prior to drilling or digging.

6. Contractor is responsible to provide and install all exterior signage in complete including any concrete, masonry, steel, posts, lettering, logos, aluminum covers, etc. as shown on bid documents. Include restoration of site upon completion.

7. Contractor is responsible to furnish and install all interior signage as shown on bid documents and signage schedule.

8. Contractor to furnish and install all vinyl exterior numbers as shown on the bid documents.

9. Contractor to furnish and install cast aluminum plaque as noted on bid documents. Location to be determined by Owner.

SPECIAL REQUIREMENTS:

The special provisions outlined in Section 00210 Description of the Work form a part of this bid category work description and apply to this bidder's scope of work.

1. Contractor is responsible to furnish all Barton Malow Company start-up documents within two (2) weeks of contract award. This includes signed contract, bonds, certificate of insurance with **CG 20 10 01 85** AND **CG 20 37 10 01 endorsements**, schedule of values, contact list, signature list, sub/supplier list, site specific safety program, MSDS's, and the Barton Malow Company Safety Certificate (section 01600). The submittal register will be issued at award of contract and the due date of the submittals will be provided at that time. Each contractor and office engineer is to attend a Construction Kick-Off Meeting and Pre-Construction Meetings.
2. It is the responsibility of this Bid Category to review all drawings and drawing notes, including civil, architectural, structural, mechanical and electrical drawings, and include items requiring work that is generally defined as the responsibility of this Bid Category within the work description.
3. Bidder shall complete the Bid Proposal form in its entirety. Special attention is directed to the Alternates and Unit Prices Section of this form.
4. The special provisions outlined in Section 00210, Description of the Work, form a part of this Bid Category work description and apply to this bidder's scope of work.
5. This Bidder is required to submit alternate prices identified in the bidding documents that pertain to their work. These alternate prices must be separate from their base bid on the bid proposal form as described in Section 00200, Instruction to Bidders.
6. All work under this scope shall comply with proper trade jurisdictions, even if it is necessary to assemble composite crews or subcontract to appropriate trades.
7. All contractors must submit the training cards for the competent person to be trained in CPR, First Aid, Asbestos Awareness, Lead Renovator, and any other certifications required by the trade and area of work.
8. Contractor, as well as, employees must be Certified Lead Renovators as required by the EPA effective April 22, 2010.
9. All are to provide daily clean-up according to Barton Malow standards, including daily removal of all materials and debris related to this category. If daily clean-up is not performed, the Construction manager will provide a laborer to complete the clean-up and the appropriate contractor will be back charged.
10. All are required to coordinate with other trades, including mandatory participation in job meetings.
11. Contractors must provide adequate crew sizes to perform work as scheduled.

END OF BID CATEGORY 116000 – PLAYGROUND

BID CATEGORY 116000 – PLAYGROUND & SITEWORK

The work of this bid category includes but is not limited to providing all labor, equipment, materials, scaffolding, hoisting and incidentals to complete the scope of work for ECC BP#4 in accordance with the specifications, drawings and applicable codes. All work is to be performed as shown on the plans, described in the bid category work descriptions, project manuals and specified in the following technical specification sections:

Specification Section	Description of Section
DIVISION 3 – CONCRETE	
033000	Cast In Place Concrete
033010	Portland Cement Concrete
DIVISION 5 – METAL	
057300	Architectural Railing System
DIVISION 6 – WOOD, PLASTICS, AND COMPOSITES	
061050	Turf Anchor
068200	Glass Fiber Reinforced Polymer
DIVISION 11 - EQUIPMENT	
116800	Playground Equipment
116813	Playground Safety Surfacing
DIVISION 31 - EARTHWORK	
312000	Earthwork
312010	Earthwork – Turf
313219	Geotextile Fabric
DIVISION 32 – EXTERIOR IMPROVEMENTS	
321123	Aggregate Drainage Layer
321810	Playground Turf Surface
323130	Chainlink Fence – Vinyl
323200	Limestone Retaining Wall
329300	Exterior Plants
329410	Engineered Wood Fiber
DIVISION 32 - UTILITIES	
334413	Manholes, Catch Basins, and Similar Structures
334605	Subdrainage Systems – Flat Draintile
334615	Subdrainage Systems - Peastone

In addition to the above, this bid category includes but is not limited to the Bidding Documents, the Bidding and Contract requirements and Division 1 General Requirements of the Project Manual and various other Technical Specifications interfacing with this work. **The bidder is advised to review the work descriptions of the other categories as well as their own so as to not misunderstand scope responsibilities.**

THE SCOPE OF THIS BID CATEGORY SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING ITEMS:

1. Each category shall be responsible for items of work as described in Section 00210 Descriptions of Work/Special Provisions/Requirements.

2. This contractor shall be responsible for all layout, engineering, elevations and layout coordination with other contractors. It is the responsibility of this contractor to layout all work of this category from established control

lines. Upon completion of the work, furnish signed and sealed as-builts that tie all site improvements to property lines and/or building corners and meet the requirements of Section 01700 of the Project Manual.

3. It is the responsibility of this Bid Category to review all drawings & drawing notes, including civil, landscaping, architectural, structural, mechanical, and electrical drawings, and include items requiring work that is generally defined as the responsibility of this Bid Category within the work description unless otherwise noted above in the scope of work.

4. This contractor shall be responsible for receiving, off-loading, hoisting of building materials and include the safe and secure storage of materials related to this work.

5. Provide 48-hour notice to the Construction Manager prior to placement of backfill, concrete and asphalt so the testing laboratory can be scheduled to test these materials. This contractor will be responsible for the cost of emergency testing services for not complying with the 48-hour notice.

6. This contractor is responsible for visiting the site prior to bidding.

7. Provide all site preparation, earthmoving, excavation, filling, back filling, compaction, sheeting, shoring, bracing, grading and site balancing required for completion of this project.

8. Provide and install all concrete reinforcements, curing compounds, control joints, expansion joints, joint sealants, caulking, fillers, and related accessories, as specified.

9. Furnish and install all cast-in-place concrete and limestone for all exterior concrete including any footings, foundations, knee walls etc. as shown on the bid drawings.

10. Supply and install all required surface treatments, sealers, and curing compounds for all exterior concrete, including all preparation and cleaning as specified

11. This contractor will be responsible or all re-mobilization costs for all phases of work.

12. This contractor is to provide all legal disposal off-site of the debris that is a result of their work.

13. This contractor shall include all overtime and shift time necessary to complete the work within the project schedule. Crew sizes shall be dependent on available work. Contractor will be required to work in multiple areas and at both sites, simultaneously and concurrently. See Special Instruction for additional overtime requirements.

14. Provide and install all items shown and specified in the bid documents including certifications and necessary permits.

15. This contractor is required to contact MISS DIG and existing sitework contractor to locate existing utilities prior to drilling or digging.

16. This contractor is responsible for all landscaping, lawn restoration, planting, seeding, limestone, sod, etc. as shown on the landscape drawings.

17. This contractor is responsible to furnish and install the gravity wall in complete including all limestone, cap stone, sealants, and expansion joints as shown in the bid documents.

18. This contractor is responsible for furnishing and installing all playground equipment, benches, picnic tables, and shade structures as noted on the drawings.

19. This contractor is responsible for furnishing and installing all synthetic turf, playground surfacing, and engineered wood fiber, as shown on the bid documents.

20. This contractor is responsible for all grading as shown on the grading plans.

21. This contractor is responsible for all site fencing, guardrails, gates, and arched bridge as shown on the bid documents.

22. Contractor to review existing site plans and provide proposals accordingly, including any demolition and installation of new equipment. Include all documentation as requested.

SPECIAL REQUIREMENTS:

The special provisions outlined in Section 00210 Description of the Work form a part of this bid category work description and apply to this bidder's scope of work.

1. Contractor is responsible to furnish all Barton Malow Company start-up documents within two (2) weeks of contract award. This includes signed contract, bonds, certificate of insurance with **CG 20 10 01 85** AND **CG 20 37 10 01 endorsements**, schedule of values, contact list, signature list, sub/supplier list, site specific safety program, MSDS's, and the Barton Malow Company Safety Certificate (section 01600). The submittal register will be issued at award of contract and the due date of the submittals will be provided at that time. Each contractor and office engineer is to attend a Construction Kick-Off Meeting and Pre-Construction Meetings.
2. It is the responsibility of this Bid Category to review all drawings and drawing notes, including civil, architectural, structural, mechanical and electrical drawings, and include items requiring work that is generally defined as the responsibility of this Bid Category within the work description.
3. Bidder shall complete the Bid Proposal form in its entirety. Special attention is directed to the Alternates and Unit Prices Section of this form.
4. The special provisions outlined in Section 00210, Description of the Work, form a part of this Bid Category work description and apply to this bidder's scope of work.
5. This Bidder is required to submit alternate prices identified in the bidding documents that pertain to their work. These alternate prices must be separate from their base bid on the bid proposal form as described in Section 00200, Instruction to Bidders.
6. All work under this scope shall comply with proper trade jurisdictions, even if it is necessary to assemble composite crews or subcontract to appropriate trades.
7. All contractors must submit the training cards for the competent person to be trained in CPR, First Aid, Asbestos Awareness, Lead Renovator, and any other certifications required by the trade and area of work.
8. Contractor, as well as, employees must be Certified Lead Renovators as required by the EPA effective April 22, 2010.
9. All are to provide daily clean-up according to Barton Malow standards, including daily removal of all materials and debris related to this category. If daily clean-up is not performed, the Construction manager will provide a laborer to complete the clean-up and the appropriate contractor will be back charged.
10. All are required to coordinate with other trades, including mandatory participation in job meetings.
11. Contractors must provide adequate crew sizes to perform work as scheduled.

END OF BID CATEGORY 116000 – PLAYGROUND & SITEWORK

SECTION 00230
SCHEDULE AND PHASING

1. GENERAL

1.1. MILESTONE SCHEDULE

1.1.1. The following are the milestone schedule dates for the listed Work and will become a part of the Contract Documents. The master construction schedule will be developed after award of the Agreement with Contractor input.

Building	Milestone Activity	Scheduled Start	Scheduled Completion
ECC Building	Playground & Signage	March 2019	July 2019

1.1.2. It is expressly agreed that time is of the essence for the completion of Work under the Agreement and Contractor agrees to perform the Work within the allotted time and in the manner specified. Contractor shall be liable for any and all damages and expenses suffered by the Owner or CM arising or resulting from the failure of Contractor to perform the Work in accordance with the construction schedule.

1.2. CONSTRUCTION SCHEDULE DEVELOPMENT PROCESS

1.2.1. Contractor agrees to commence Work in the field within five (5) Days after being notified to do so by the CM. Contractor shall diligently perform and fully complete all Work to the satisfaction of CM and Owner.

1.2.2. Work shall begin at such points as CM may designate and shall be carried to completion with the utmost speed.

1.3.2. Contractor shall submit to CM within fifteen (15) Days of award of the Agreement all necessary scheduling information, in form and substance satisfactory to CM of all activities contained in the Contractor's scope of Work, including activity descriptions and durations in working days, for shop drawings, fabrication, delivery and installation of products, materials and equipment. This schedule shall identify precedent relationships between Contractor's activities and those of other contractors, the dollar value, necessary manpower loadings, and precedent activities for other contractors. The activities on the schedule must be at a level of detail approved by CM and should agree with the terminology and building sequencing established by CM. CM will compile all Contractors' schedules and develop a project master construction schedule. Once the individual contractors schedules are agreed upon by CM, this project master construction schedule will become the project plan for construction.

1.3.3. Special requirements and/or sequencing issues should be brought to the attention of CM. It is intended the milestones remain in effect and all Bidders agree to accept the milestone dates. CM reserves the right to revise the project master construction schedule as deemed necessary.

1.3.4. CM shall periodically update the project master construction schedule and display it at the Project site. Contractor shall familiarize itself with the project master construction schedule and how it will affect or modify its operations, including coordination with the activities of other contractors. Reasonable changes in sequencing, durations and phasing are to be expected with each master schedule update. These changes will be made by Contractor at no additional cost. Reasonable changes in sequencing, durations, and phasing are to be expected with each master schedule update. These changes will be made by Contractor at no additional cost.

1.3.5. If it is apparent Contractor is unable to perform its Work in the sequence indicated or the time allotted, Contractor must notify CM within five (5) Days after initial publication of the project master construction schedule. Contractor's schedule of activities may be re-sequenced, and the schedule may be adjusted, provided all Work is completed within the stated milestone dates and provided CM and affected contractors are notified of the change within five (5) calendar days of receipt of the schedule and the change does not otherwise negatively impact the other scheduled

work; otherwise, the project master construction schedule shall be deemed accepted by all parties and becomes a contractual requirement for each Contractor.

1.3.6. If Contractor delays progress for any reason other than those delays specifically excused under the Contract Documents, Contractor will take all necessary steps to expedite its Work to maintain milestone target dates at no expense or additional cost to Owner or CM.

1.3.7. If Contractor is behind schedule and is so notified by CM, Contractor shall be required to accelerate the Work at its own expense. Contractor shall furnish to CM a short interval schedule of its Work showing location, number of men and crew required to get back on the agreed upon master construction schedule. If Contractor fails to maintain and meet the short interval schedule, Owner through CM reserves the right to take whatever steps it deems necessary in its sole discretion to recover the schedule at the Contractor's expense. The Contractor shall employ such means as overtime work, multiple work shifts, and additional equipment, all without additional compensation, and shall continue to do so until the progress of the Work, in the opinion of CM, is in conformance with the master project construction schedule.

1.3.8. Contractor agrees that it shall have no claim against the Owner, Architect, or CM for an increase in the contract price or for a payment or allowance of any kind for damage, loss, or expense arising or resulting from delays, regardless of whether the delay is the basis for an extension of time. This provision includes claims for damage, loss, or expense arising or resulting from interruptions to, or necessary suspension of, Contractor's Work to enable other contractors to perform their work.

END OF SECTION 00230

SWORN AND NOTARIZED FAMILIAL DISCLOSURE STATEMENT

FAMILIAR DISCLOSURE AFFIDAVIT

The undersigned, the owner or authorized office of the below–named contractor (the 'Contractor"), pursuant to the familial disclosure requirement provided in this proposals, hereby represents and warrants that, excepts as provided below, no familial relationship exists between the owner or key employee of the Contractor, and any member of the Troy School Board or the Troy School Superintendent. A list of the School District's Board of Education Members and its Superintendent may found at http://www.troy.k12.mi.us.

List any Familial Relationships:

Contractor:

_____
Print Name of Contractor

By: _____

Its: _____

Subscribed and sworn before me, this _____ Seal:

day of _____, 20 ____, a Notary Public

in and for _____ County, _____

_____
(Signature)
NOTARY PUBLIC

My Commission expires _____

CERTIFICATION OF COMPLIANCE – IRAN ECONOMIC SANCTIONS ACT

Michigan Public Act No. 517 of 2012

The undersigned, the owner, or authorized officer of the below-named Company, pursuant to the compliance certification requirement provided in Troy School District's Request For Proposal, the "RFP", hereby certifies, represents, and warrants that the Company and its officers, directors and employees, is not an "Iran Linked Business" within the meaning of the Iran Economic Sanctions Act, Michigan Public Act No. 517 of 2012 (the "Act"), and that in the event the Company is awarded a contract by Troy School District as a result of the aforementioned RFP, the Company is not and will not become an "Iran Linked Business" at any time during the course of performing any services under the contract.

The Company further acknowledges that any person who is found to have submitted a false certification is responsible for a civil penalty of not more than $250,000.00 or two (2) times the amount of the contract or proposed contract for which the false certification was made, whichever is greater, the cost of Troy School District's investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on a request for proposal for three (3) years from the date the it is determined that the person has submitted the false certification.

Contractor:

_____
Print Name of Contractor

By: _____

Its: _____

Subscribed and sworn before me, this _____ Seal:

day of _____, 20 ____, a Notary Public

in and for _____ County, _____

_____
(Signature)
NOTARY PUBLIC

My Commission expires _____

END OF SECTION 00410

SECTION 00500
AGREEMENT

1 AGREEMENT FORM

1.01 The form of Agreement that will be used for Work under this Bid Package shall be AIA Document 132 Standard Form of Agreement between Owner and Contractor, CMa 2009 Edition. The above Agreement Form is included immediately behind this section.

2. GENERAL CONDITIONS OF THE CONTRACT

2.1. AIA 232 Document **General Conditions of the Contract for Construction, 2009 Edition** is bound within this Project Manual and is a part of the Contract Documents**.**

3. INSURANCE

3.1. The description box on the ACORD certificate must be endorsed as follows:

> For Troy School District 2013 Bond Projects: Barton Malow Company, Troy School District, are added as additional insureds on the Insured's commercial general liability policy, excess liability policy, automobile liability policy, and contractor's pollution liability policy, with respect to liabilities arising out of the operations or "work" performed by or on behalf of the Insured and in accordance with all Contractor requirements for such coverage. Coverage for the additional insureds is primary and non-contributory with any other insurance available to the additional insureds, whether such other insurance is available on a primary or excess basis. Waivers of subrogation apply in accordance with Contractor requirements.

3.2. A sample of the Certificate of Insurance (ACORD) form at the end of this Section.

3.3. CM Contractor Insurance Requirements for Agency Work, PRO 15.14, shall govern this Project. A copy of these Insurance Requirements is included in the following page(s):

BARTON MALOW COMPANY
CONTRACTOR
INSURANCE REQUIREMENTS
For agency work
March 10, 2008

1. As a condition of performing work under the Agreement, Contractor will keep in force, at all times during performance of the Work, policies of insurance covering all Basic Insurance Requirements and any applicable Supplemental Insurance Requirements. The requirements identified below are minimum requirements. If the Agreement or other Contract Documents impose additional or higher standards, Contractor shall meet those as well. Where a Controlled Insurance Program ("CIP") is specified in the Contract Documents, these insurance requirements shall not apply to coverages supplied by the CIP, but shall apply to coverages which Contractor is required to carry outside the scope of the CIP.

2. Basic Insurance Requirements

2.1. Workers' Compensation covering Contractor's statutory obligations in the State(s) in which the Work is to be performed or Federal statutory obligations, if applicable to the Project, and Employers' Liability insurance with limits of liability of $1,000,000 EL Each Accident, EL Disease – Each Employee, and EL Disease – Policy Limit. Where applicable, a US Longshore and Harborworker's Compensation Act endorsement must be included.

2.1.1. If Contractor employs the services of leased employees for the Work or for a portion of the Work, it will be required to submit evidence, to the satisfaction of Barton Malow Company, that such leased employees are fully covered by the minimum limits of Workers' Compensation and Employers' Liability Insurance. Such evidence shall include, but not be limited to, submission of the applicable leasing agreement.

2.2. Automobile Liability insurance with the limit of $1,000,000 per accident covering Contractor's owned, non-owned and hired automobiles.

2.3. Commercial General Liability insurance written on the 1988 ISO OCCURRENCE policy form or subsequent versions with limits of liability as follows:

General Aggregate	$ 2,000,000
Products-Completed Operations Aggregate	$ 2,000,000
Personal/Advertising Injury	$ 2,000,000
Each Occurrence	$ 2,000,000

This coverage shall include coverage for premises-operations, independent contractors' protective, products and completed operations, personal injury and broad form property damage (including coverage for explosion, collapse, and underground hazards), and Contractual Liability protection with respect to Contractor's indemnification obligations under the Contract Documents. Products-completed operations coverage must be maintained for at least two years after final completion of the Project.

3. Supplemental Insurance Requirements

3.1. Watercraft Protection and Indemnity Liability insurance if any of the Work is on or over navigable waterways or involves use of any vessel. Limits are to be approved by Barton Malow Company in writing.

3.2. Aircraft Liability insurance if any aircraft is used in performance of the Work. Limits are to be approved by Barton Malow Company in writing.

3.3. Railroad Protective Liability insurance if any of the Work is on or within 50 feet of any railroad or affects railroad property, including but not limited to tracks, bridges, tunnels, and switches. Limits are to be approved by Barton Malow Company in writing.

3.4. Professional Liability insurance, if Professional Services are provided, with limits of

liability as follows: Each Claim	$ 5,000,000
Aggregate	$ 5,000,000

Provided, however, that if the Subcontract Price is $10,000,000 or less, then the following limits of liability shall apply:

Each Claim	$ 2,000,000
Aggregate	$ 2,000,000

Contractor shall keep such Professional Liability insurance in force during the Agreement, and for three years after final completion of the Project.

3.5. Pollution Liability insurance, which must be on an occurrence basis, if Environmental Services are provided. "Environmental Services" means any abatement, removal, remediation, transporting, or disposal of a Hazardous Material, or any assessments or consulting relating to same. Limits of liability for Pollution Liability insurance shall be as follows:

Each Occurrence	$ 5,000,000
Aggregate	$ 5,000,000

4. General Provisions

4.1. Every policy must be written by an insurance company licensed in the state where work is being done and is reasonably acceptable to Barton Malow Company and Owner.

4.2. Limits for Employer's Liability, Commercial General Liability and Automobile Liability may be attained by a combination of an underlying policy with an umbrella or excess liability policy.

4.3. "Barton Malow Company," Owner, and all other entities as required in the Contract Documents shall be endorsed as additional insureds on Contractor's liability insurance (including general liability, excess liability, automobile liability and pollution liability, where applicable) with respect to liability arising out of activities, "operations" or "work" performed by or on behalf of Contractor, including Barton Malow Company's general supervision of Contractor, products and completed operations of Contractor, and automobiles owned, leased, hired or borrowed by Contractor. The coverage provided by the additional insured endorsement shall be at least as broad as the Insurance Service Office, Inc.'s Additional Insured, Form B CG 20 10 11 85 or CG 20 26 11 85. Forms that do not provide additional insured status for completed operations will not be accepted. In no case shall any additional insured endorsement exclude coverage for Barton Malow Company's or Owner's own negligence nor limit coverage for Barton Malow Company or Owner only to potential liability incurred solely as a result of Barton Malow Company's or Owner's acts or omissions. Furthermore, nothing in the additional insured endorsement shall limit Barton Malow Company's or Owner's products-completed operations coverage to only those liabilities arising from Contractor's "ongoing operations".

4.4. Contractor will furnish, before any work is started, certificates of insurance and copies of any additional insured endorsements for Contractor's liability policies showing the required coverages. Receipt by Barton Malow Company of a non-conforming certificate of insurance without objection, or Barton Malow Company's failure to collect a certificate of insurance, shall not waive or alter Contractor's duty to comply with the insurance requirements. Modifications to these insurance requirements will not be effective unless made in a writing executed by an authorized representative of Barton Malow Company. Upon written request by Barton Malow Company, Contractor will provide copies of its insurance policies.

4.5. Evidence of the required insurance is to be provided to Barton Malow Company on ACORD Certificate Form 25-S and must indicate:

4.5.1. Any coverage exclusions or deviations from the 1988 ISO commercial general liability form or subsequent versions;

4.5.2. A Best's rating for each insurance carrier at A minus VII or better;

4.5.3. That the issuing insurance company will provide thirty (30) days written notice of cancellation to the certificate holder and the words "endeavor to" and "but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or representatives" do not apply or have been removed;

4.5.4. That additional insured endorsements have been provided as required under the Contract Documents; and

4.5.5. Any deductibles over $10,000 applicable to any coverage.

4.6. All coverage must be primary and not excess over or contributory with any other valid, applicable, and collectible insurance or self-insurance in force for Barton Malow Company, Owner, or other additional insureds.

4.7. Contractor will provide full coverage for all of Contractor's equipment, property and tools used in the Work.

4.8. Contractor shall waive, and shall require (by endorsement or otherwise) its insurers providing the coverage required by these insurance requirements to waive, subrogation rights against Barton Malow Company, Owner, and all other additional insureds for losses and damages incurred and/or paid under the insurance policies required by these insurance requirements or other insurance applicable to Contractor or its Subordinate Parties, and will include this same requirement in contracts with its Subordinate Parties. If the policies of insurance referred to in this paragraph require an endorsement to provide for continued coverage where there is a waiver of subrogation, the owners of such policies will cause them to be so endorsed.

4.9. Contractor will send or fax a copy of these insurance requirements to its agent when an insurance certificate is requested to assure that the policies comply with the insurance requirements.

4.10. If Contractor requires its Subordinate Parties to provide additional insured endorsements in favor of Contractor, those endorsements shall be extended to Barton Malow Company, Owner and all other required additional insureds.

4.11. Contractor's duty to provide the insurance coverage set forth in these insurance requirements is a severable obligation from Contractor's indemnification obligations under the Contract Documents. Nothing in these insurance requirements shall be deemed to limit Contractor's liability under the Agreement.

4.12. If these insurance requirements are used in conjunction with a Project where an Affiliated Company of Barton Malow Company is acting as Construction Manager, Design Builder or otherwise (the "Construction Entity"), the term "Barton Malow Company" as used in these insurance requirements shall be deemed to be replaced with the name of the Construction Entity, and the additional insured requirements of Section 4.3 above shall be amended to include "Barton Malow Company", and all partners and/or members of the Construction Entity as applicable. "Affiliated Company" means any entity in which Barton Malow Company has an ownership interest.

END OF DOCUMENT PRO 15-14

4. BOND REQUIREMENTS

4.1. PERFORMANCE BONDS AND PAYMENT BONDS

4.1.1. Troy School District will, require Contractor to furnish a Performance Bond and a Payment Bond, in amounts equal to the Agreement price, by a qualified surety naming both the Owner and CM as Obligees. All sureties providing bonds on this Project must be listed in the Department of Treasury's Circular 570, entitled "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" with the bond amounts less than or equal to the underwriting limitation indicated in the Circular, and/or must have an A.M. Best rating of A – VII or better. Bonds shall be duly executed by the Contractor, as principal, and by a surety that is licensed in the state in which the Work is to be performed.

4.1.2. The Contractor shall deliver the required bonds to CM prior to execution of the Agreement. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder, at a minimum, shall submit evidence to the satisfaction of CM that such bonds will be furnished prior to commencement of on-site Work. In no event may the Contractor commence on-site Work without the required bonds properly issued and delivered.

4.1.3. Performance Bond and Payment Bond unmodified form AIA Document or A312 (1984 Edition) must be used for this Project.

4.1.4. The Bidder's proposed surety must be acceptable to the Owner and CM. If, at any time, after acceptance of the Contractor's bonds, the surety fails to meet the stated criteria Contractor must, as a precondition to continuing Work and receiving further payments, replace the bonds with bonds from a surety that meets the stated criteria.

4.1.5. The Performance and Payment Bond penal sums (i.e., the Agreement price) must be listed as a separate line item in the schedule of values.

4.1.6. In the event of a Change Order, the penal sum of any required Performance and Payment Bonds shall be adjusted to equal the adjusted Contract Price. CM or Owner shall have the right to request submission of bond riders, issued by the original qualified surety, evidencing that such adjustments to the penal sum of the bonds have been accomplished. Notwithstanding the foregoing, in the next pay application after the Agreement price has been increased by twenty-five percent (25%) or more, as a condition precedent to payment, Contractor shall deliver a bond rider issued by the original qualified surety evidencing that the appropriate adjustment in penal sums has been accomplished.

END OF SECTION 00500

SECTION 00810
ON-SITE PROJECT SAFETY AND LOSS CONTROL PROGRAM

1 SUBCONTRACTOR'S SAFETY REQUIREMENTS

1.01 Generally the Subcontractor

1.01.1 is responsible for its own Safety Program for Work on this Project that is at least as stringent as the requirements set forth in this section of the Project Manual.

1.01.2 shall provide a safe workplace and shall otherwise take all precautions for the safety of Subordinate Parties and persons and property in or near the premises where Work is being performed.

1.01.3 shall comply with all applicable federal, state and local laws, rules and regulations, including, but not limited to, applicable provisions of the Occupational Safety and Health Act ("OSHA") and/or the governing state law.

1.01.4 shall comply with all requirements stated in the Site Specific Safety Instructions (SSSI) form or elsewhere in the Contract Documents.

1.01.5 shall ensure that its employees understand and comply with applicable safety and health programs, rules, and regulations.

1.01.6 will assign an individual to act as Safety Representative who will have the responsibility of resolving safety matters, and act as a liaison among Subcontractor, CM and the Owner. The Safety Representative must be a person who is capable of identifying existing and predictable hazards in surroundings that are unsanitary, hazardous or dangerous to employees, and has the authority to take prompt corrective measures to eliminate them. The Safety Representative must meet the standards for a Competent Person under applicable law when required (scaffolding, confined spaces, etc.). The Safety Representative must be on site full time. The Safety Representative or an alternate must attend periodic safety meetings as directed by CM. The safety representative must have completed the OSHA 30 hour Construction Training Course.

1.01.7 shall ensure that its site supervisors and/or Safety Representative attend a pre-construction meeting where planning for safe execution of the project will be addressed.

1.01.8 is fully responsible for all Hazardous Materials it creates or releases in connection with, or brings to, the Project. Subcontractor shall immediately report to CM any Hazardous Materials that it discovers or which are released at the Project.

1.01.9 Minimum training for on-site employees shall include basic safety orientation, task-specific safety instruction, weekly Tool Box Talks, and other periodic safety meetings. Subcontractor shall document all such training.

1.01.10 shall self-inspect its areas of control to assure compliance with the safety requirements.

1.01.11 All on-site employees of either Subcontractor] or its Subordinate Parties are required to report any unsafe act or condition and any work-related injuries or illness immediately to a supervisor. If the act or condition can be safely and easily corrected, the employee or supervisor should make the correction.

1.01.12 shall notify CM immediately of all injuries requiring clinical attention and all property damage potentially in excess of $1,000.

1.01.13 shall have emergency procedures to deal with the immediate removal and treatment, if necessary, of any employee who may be injured or become ill. Subcontractor] shall keep on the Project site a first-aid kit supplied according to current regulations, and shall have on-site a person trained to administer first aid.

1.01.14 shall inform CM of the arrival of any federal or state inspector or compliance officer prior to touring the site. Any reports, citations, or other documents related to the inspection shall be provided promptly to Barton Malow.

1.01.15 shall have a written Substance Abuse Policy. The use or possession of illegal drugs or the use of alcohol while performing Work on the Project are strictly prohibited and will lead to immediate removal from the Project.

1.01.16 shall be responsible for payment of all safety-related citations, fines and/or claims arising out of or relating to its Work levied against the Owner, Architect, CM, or their employees or affiliates.

1.01.17 CM has the right to require that Subcontractor H submit monthly its hours worked and incident rates for the Project.

1.02 Additional CM Requirements

1.02.1 Work crews shall conduct a Job Hazard Analysis (JHA,) discussion (i.e. Huddle) to plan for safe performance before beginning any work task. Subcontractor is required to prepare a written record of each JHA.

1.02.2 All workers, management, and visitors shall wear approved hard hats while on site, outside the trailers. Cowboy-style hard hats are prohibited. Hardhats must not be removed to use welding shields. Welding shields must attach to hardhats or be hand held.

1.02.3 Sleeved shirts (minimum of four inches), long pants, and durable work boots are required minimum clothing.

1.02.4 Personal cell phones are not to be used on construction sites except to report an emergency or on approved break time. Use of business cell phones must not interfere with jobsite safety.

1.02.5 Personal radios or music players are not permitted.

1.02.6 All persons working at elevations of six feet or greater must have 100% continuous fall protection. Engineering controls are preferred, but personal fall arrest systems are also permissible. An exception is permitted for safe use of ladders up to 24 feet long.

1.02.7 Subcontractor is responsible to repair or restore any barricade that it modifies or removes.

1.02.8 Class II III (household) stepladders are prohibited; metal ladders are strongly discouraged.

1.02.9 All scaffolds must be inspected daily and before each use for safety compliance. Scaffold inspection tags must be used. Scaffolds shall never be left in an unsafe condition and must be removed/disabled immediately if not to be used again.

1.02.10 All persons operating cranes must be certified as crane operators by the National Commission on the Certification of Crane Operators (NCCCO), Crane Institute Certification (CIC) or Operating Engineers Certification Program (OCEP). Daily written crane inspection reports must be prepared by the operator and kept with the crane, available for inspection.

1.02.11 Riding the headache ball is prohibited.

1.02.12 All dozers, loaders, tractors and end loader backhoes must have functioning backup alarms.

1.02.13 Keep equipment at least 15 feet from energized power lines.

1.02.14 Electrical, pneumatic, and other energy systems that could be accidentally energized or started up while work is in process must be locked out (not merely tagged out).

1.02.15 Only fire retardant materials may be used to build shanties or other temporary enclosures inside of buildings finished or under construction. Shanties shall be continually policed by their occupants to prevent the accumulation of waste or other combustibles.

1.02.16 Engineering controls must be used to restrain silica dust per applicable law. Dry cutting without engineering controls is prohibited.

1.02.17 The Contractor is required to design and implement a Stretch and Flex program for their employees. The purpose of the program is to gently condition the muscles and tendons for the workers before they engage in their duties in order to avoid injury. All contractors of any tier shall ensure that all employees participate in stretching exercises at the beginning of the work

day. It is recommended that you consult with your insurance carrier, licensed physician or other medical personnel to develop suitable stretches for your work crew.

1.02.18 The Contractor is required to implement a glove program. All workers performing construction work must wear appropriate protective work gloves. When not performing work gloves must be kept available for immediate use. Cut resistant work gloves are required for any operation with sharp material or cut potential.

2 Subcontractor's SAFETY SUBMITTALS

2.01 Subcontractors shall provide copies of the following written safety submittals to CM at the times indicated:

Submittal	**Timing**
Site-specific Safety Program, including substance abuse policy, hazard communication program, and Material Safety Data Sheets (MSDS)	Before on-site work begins
Tool Box Talk Reports	Weekly
Incident Reports (OSHA form 301or equivalent)	Within 24 hours of incident
Pre Task/Daily Reports	Daily
Stretch and Flex program	Before on-site work begins

2.02 Barton Malow's receipt of the Safety Program or other submittals from Subcontractor does not constitute approval of the Program or submittal or permission to deviate from the requirements of the Contract Documents and applicable law.

2.03 Subcontractor will allow inspection of, and CM may request copies of, any and all safety-related documents and records in its possession relating to the Project.

3 CM RIGHTS

3.01 **Safety Hazard Notifications** may be issued to the Subcontractor when an unsafe act or condition is reported or observed. CM shall not be required to supervise the abatement or associated reprimand of unsafe acts or conditions within a Subcontractor's scope of work as this is solely the responsibility of Subcontractor. Nevertheless, CM has the right, but not the obligation, to require Subcontractor to cease or abate any unsafe practice or activity it notices, at Subcontractor's sole expense.

3.02 Contractor/Subcontractor's failure to comply with the contract safety requirements will be considered a default of the Agreement, and may result in remedial action including, but not limited to, withholding of payment of any sums due or termination.

3.03 CM's failure to require the submission of any form, documentation, or any other act required under this Section, 00810, of the Project Manual shall not relieve the Subcontractor from any of its safety obligations.

3.04 Nothing in this Section or in this Agreement makes CM responsible or liable for protecting Subcontractor's employees and other Subordinate Parties or assuring or providing for their safety or preventing accidents or property damage.

3.05 All requirements referenced in this Section 00810 are binding on Subcontractor and all of its Subordinate Parties, even where such requirements may exceed the standards of applicable law.

END OF SECTION 00810

SECTION 00840
HAZARDOUS MATERIALS

1. DEFINITION OF HAZARDOUS MATERIALS

1.1. A “Hazardous Material”, as used in this Project Manual means asbestos; asbestos containing material; lead (including lead-based paint); PCB; molds; any other chemical, material, or substance subject to regulation as a hazardous material, hazardous substance, toxic substance, or otherwise, under applicable federal, state, or local law; and any other chemical, material, or substance that may have adverse effects on human health or the environment.

2. AWARENESS OF HAZARDOUS MATERIALS

2.1. Each Contractor shall be constantly aware of the possible discovery of Hazardous Materials. Should Contractor encounter any Hazardous Material or suspected Hazardous Material, the Contractor shall immediately stop Work in the area affected and report the condition to CM.

2.2. If the Contractor encounters any Hazardous Material or suspected Hazardous Material, the Contractor agrees to immediately initiate the required procedures of the Environmental Protection Agency (EPA), and/or state or local agencies having jurisdiction to protect any and all persons exposed to the affected areas or adjacent areas affected thereby

2.3. Contractor is fully responsible for all Hazardous Materials it creates or releases in connection with, or brings to, the Project

2.4. Each Contractor shall be responsible to bind ALL of its personnel and its Subordinate Parties to the provisions in the contract documents related to hazardous materials and to instruct each employee of its own duty to report any and all suspected Hazardous Materials and to comply with all applicable laws.

2.5. ABSOLUTELY NO MATERIAL SHALL BE BROUGHT ON OR TO THE PROJECT SITE THAT DOES NOT HAVE A MANUFACTURER'S LABEL STATING CONTENTS.

2.6. The Contractor shall comply with all applicable federal and state laws, rules, ordinances and regulations regarding transportation, storage, spills, releases and disposal of Hazardous Materials.

2.7. No asbestos or asbestos-containing material will be brought to the jobsite or incorporated into the Work by Contractor or its Subordinate Parties.

END OF SECTION 00840

SECTION 00880
REGULATORY REQUIREMENTS

1. STANDARDS, CODES AND REGULATION

   1.1. All Work is to comply with the rules and regulations of governing bodies having jurisdiction.

   1.2. Standards, codes and regulations published by Manufacturer's associations, governmental agencies and other regulatory authorities form a part of these Specifications as minimum requirements. Such references include the latest issue and legal requirements in force.

   1.3. Where differences occur between the Contract Documents and such standards, the strictest requirements shall take precedence.

   1.4. Supply all materials and perform all Work in accordance with the Manufacturer's specifications and installation procedures, and in conformance with published Trade and Manufacturers' association standards, unless specifically noted otherwise in the Contract Documents.

2. PERMITS AND FEES

   2.1. The Troy School District will obtain and pay for the General Building Permit.

   2.2. Other than the general building permit, Contractor shall provide and pay for all other permits, assessments, governmental fees, bonds, connection charges, licenses and inspection fees and any other charges necessary for the proper execution and completion of the Contractor's Work.

   2.3. Contractor is to provide, pay for and coordinate all other permits, fees, inspections, and city, county, state, federal and governing authority approvals required for the successful completion of the Work contained within its respective Bid Category and deliver required certificates of inspection and approvals to CM.

   2.4. This Project is under but not limited to the jurisdiction of the

   - MICHIGAN DEPARTMENT OF LABOR FOR MECHANICAL AND ELECTRICAL
   - STATE OF MICHIGAN FIRE MARSHAL DIVISION
   - MICHIGAN DEPARTMENT OF PUBLIC AND (COUNTY) DEPARTMENT OF PUBLIC HEALTH
   - Site water and sewer utilities are under the jurisdiction of the COUNTY DRAIN/ROAD COMMISSION authorities

3. TAXES

   3.1. This Project is subject to all applicable state Sales Tax and/or Use taxes, and Bidder must include such taxes in its Bid Proposal. All other taxes applicable to the project at the time of the bid are to be included in the bid amount and will be the responsibility of Bidder.

END OF SECTION 00880

SECTION 01140
USE OF PREMISES

1 RULES AND ENFORCEMENT:

1.1. Contractor and its Subordinate Parties shall be subject to rules and regulations for the conduct of the Work as stated herein and as the Owner or CM may establish.

1.2. Willful disregard of the following will be grounds for requiring the offending person(s) to be removed from the Project, and may subject the Contractor to termination under the Agreement.

2 USE OF PREMISES AND DELIVERIES

2.1. ACCESS TO WORK:

2.1.1. Before starting the Work, Contractor shall ascertain from CM what entrances, routes or roadways shall be used for access to the Work, and use only those designated for movement of personnel, materials and vehicles to and from the Project site.

2.1.2. Close coordination is required of Contractor with the Owner, CM, other contractors, the city and others having an interest in the Project to assure that Work on the site, access to and from the site and the general conduct of operations is maintained in a safe and efficient manner, and that disruption and inconvenience to existing streets and property is minimized.

2.1.3. Contractor is responsible to review the site and be familiar with all existing conditions within and around the Owner's property including local conditions and requirements.

2.2. ENTRANCES AND DRIVES

2.2.1. Specific entrances for material deliveries, equipment deliveries and worker access to the Project site will be as designated/directed by CM.

2.2.2. Selected entrances to the Project site will remain open for use during normal working hours.

2.2.3. At no time are vehicles to be parked, whether attended or not, in the Owner's entrances or drives.

2.2.4. Any material delivery which will tie up the Owner's entrances or drives shall be pre-scheduled with the Owner through CM.

2.2.5. Owner's deliveries and operations will take precedence over scheduling of construction deliveries.

2.3. ACCESS TO BUILDINGS:

2.3.1. Maintain free access to all buildings and areas of the site for designated vehicles, service vehicles and firefighting equipment, and at no time shall block off or close roadways or fire lanes without providing auxiliary roadways and means of entrance acceptable to the Owner and CM.

2.3.2. Maintain a clean and safe passageway for the Owner's operations and personnel in existing areas, and maintain clearances adjacent to and in connection with the Work performed. Fire hydrants must remain accessible at all times.

2.3.3. Give the Owner and the local fire department at least forty-eight (48) hours' notice of any such changes of routes.

2.4. SITE PARKING:

2.4.1. There is on-site parking for Contractors and their Subordinate Parties' employees.

2.4.2. Contractor, Subordinate Parties and their personnel will be allowed to park in the Owner's parking area. Each Contractor is responsible for providing transportation to and from the site, if required.

2.5. LOADING OF STRUCTURE: Each Contractor on behalf of itself and its Subordinate Parties shall not load or permit any part of a structure to be loaded with a weight that will endanger its safety.

2.6. USE OF OWNER'S EQUIPMENT: Contractors and their Subordinate Parties will not be allowed to use any Owner tools or equipment during the course of the Project.

2.7. USE OF EXISTING ELEVATORS

2.7.1. Contractor may subject to the approval of CM and Owner, use the existing elevator(s) designated by the Owner within the contract boundaries for movement of personnel and materials to a construction area.

2.7.2. In those cases where an elevator is to be shared with Owner services, the Owner's employees and services take priority over construction activities.

2.7.3. Contractor is responsible for proper conduct with regard to the use of the elevator. Any damage to the elevator due to oversize load, excess weight or other conditions is the individual Contractor's responsibility.

2.7.4. Use of the elevator(s) at times other than normal working hours shall be coordinated with CM and Owner.

2.8. USE OF EXISTING FACILITIES

2.8.1. Limit the usage of the occupied areas of the facility to that which is absolutely necessary for the installation of the Work. Parts of the facility not in the construction area are "off limits" unless a specific work task is being performed as designated by CM.

2.8.2. Use of the Owner's cafeteria, parking, telephones, toilet facilities, tools, equipment, or any other item or facility belonging to the Owner is not allowed unless specifically authorized by Owner and CM.

2.8.3. Restrict all Work activities associated within an area undergoing renovation to the boundaries indicated by the Contract Documents. Any means of access or egress from the stipulated boundaries shall be coordinated with CM and the Owner.

3 WORK HOURS:

3.1. Normal working hours are; 7:00 AM to 3:30 PM, Monday through Friday.

3.2. Work operations shall comply with all applicable laws, ordinances, and regulations, and not create a public nuisance nor disturb the peace.

3.3. Compensation to CM for supervisory staff due to abnormal working hours will be at the requesting Contractor's expense.

3.4. Whenever Contractor intends to depart from normal work hours, it shall notify CM in writing at least forty-eight (48) hours in advance. Failure of Contractor to give such timely notice may result in CM directing the removal or uncovering of the Work performed during such abnormal hours at Contractor's expense. Special arrangements can be made for emergency work or shutdowns as may be required.

3.5. Required off-hours work:

3.5.1. Contractors may be requested to work split shifts, weekends, off peak Owner loading periods, etc., to accommodate Owner's utility and service requirements, such as, but not limited to, medical gas systems, electrical power, HVAC systems, storm and sanitary lines.

3.5.2. All Work shall be bid on a straight time basis. Should premium time be required by the Owner, the cost for premium time labor, which may be required, is the Contractor's responsibility and is to be included in the base bid.

4 USE OF EXPLOSIVES: Is NOT permitted.

5 DUST, DIRT, NOISE: Each Contractor shall effectively confine or eliminate dust, dirt and noise to the actual construction area and in compliance with all applicable laws, rules and regulations.

6 BEHAVIOR AND CONDUCT: The Owner and CM expect Contractors and their Subordinate Parties to exercise common sense and good judgment, and to conduct themselves in a manner which would be a credit to the Owner. Without limiting other applicable provisions of the Contract Documents, Contractor shall not engage in the following:

6.1. Conduct that interferes with Work or work of others.

6.2. Conduct that interferes with or is detrimental to safety, well-being of the owner, their operations and/or good reputation.

6.3. Unauthorized use of confidential information.

6.4. Discourtesy toward Owner's staff, visitors and the general public (including abusive, vulgar or other language.)

6.5. Soliciting, canvassing, posting, or distributing literature or materials for any purpose while on the job site.

6.6. Disregard of safety, sanitation, or security laws, rules and regulations.

6.7. Stealing.

6.8. Gambling.

6.9. Possession and/or use of narcotics or intoxicants.

6.10. Threats or abuse of others.

6.11. Disorderly conduct or fighting.

6.12. Playing of loud music.

6.13. Falsification of information.

6.14. Unauthorized travel of Contractor's employees outside the designated project Work areas.

6.15. Discriminating behavior.

6.16. Possession and/or use of weapons or firearms.

6.17. Sexual or Ethnic harassment.

6.18. Smoking: Contractors and their Subordinate Parties shall be responsible for adhering to the smoking policies and regulations of the Owner and the Owner's facilities.

7 TEMPORARY PARTITIONS:

7.1. Partition construction shall provide a fire-resistant classification approved by the authorities having jurisdiction. Openings in such partitions shall be protected by fire doors consistent with the rating of the partition. Any trade creating penetrations through the temporary partitions shall fire stop openings to match the rating of the wall.

8 PROTECTION OF FACILITIES

8.1. Each Contractor on behalf of itself and its Subordinate Parties shall be responsible for all damage to the Project including the existing buildings and grounds arising or resulting from its operations under the Agreement. Repair or replacement of damaged items shall be to the satisfaction of the Owner and CM.

8.2. Each Contractor shall provide and maintain proper shoring and bracing for existing underground and aboveground utilities, foundations, structure and systems encountered during its Work and shall

8.2.1. protect the project, or any part thereof, and surrounding areas from collapse or movement, or any other type of damage until such time as they are to be removed, incorporated into the new Work or can be properly supported or backfilled upon completion of new Work.

8.2.2. limit disruptions to a maximum of four (4) hours.

8.2.3. prior to beginning any Work that may affect underground facilities, contact MISS DIG and utility companies for the location of all existing underground services.

8.2.3.1. Provide documentation of such contact to CM.

8.2.3.2. If necessary, Contractor shall pay for layout and locating of existing utilities.

8.3. Utilities and/or other services which are shown, or not shown but encountered, shall be protected by the Contractor from any damage arising or resulting from Work, unless or until they are abandoned. If the utilities or services are damaged from Contractor's Work, Contractor shall immediately repair any damage and restore the utilities and services to an equal or better condition than that which existed prior to the damage. Contractor will be responsible for all liabilities, expenses, lawsuits or claims arising or resulting from such damage and will defend, hold harmless and indemnify Owner and CM from any claims or lawsuits or other expenses.

8.4. Each Contractor on behalf of itself and its Subordinate Parties shall be responsible for all damage to the Project and surrounding areas including the existing building and grounds arising out of or resulting from their performance of the Work. Repair or replacement of damaged items shall be to the satisfaction of the Owner and CM.

8.5. Preservation of existing trees and other vegetation on the site to the maximum extent possible is required.

8.5.1. Each Contractor must plan its Work and instruct its Subordinate Parties to conduct their operations to avoid damage to trees and vegetation (provide barriers as required.)

8.5.2. Indiscriminate driving about the site, disposing of waste, storage of materials upon or against trees or any other activity which is harmful to trees or vegetation will not be tolerated.

8.5.3. Any case of damage to any tree shall be reported to CM immediately so that professional repairs can be made. The cost of such required repairs or treatment shall be charged to the responsible Contractor.

9 OWNER'S OPERATIONS & INTERRUPTION OF OCCUPANCY /SEQUENCING

9.1. The Owner shall have the option to curtail or delay any activity that affects its operations. Should a Contractor be asked to stop its Work, the Contractor shall do so immediately and proceed with other activities with no additional cost to the Owner or CM.

9.2. The Owner may occupy the premises during the entire period of construction to conduct operations.

9.3. Each Contractor is responsible to plan, coordinate and execute its Work in such a manner that there will be no disruption of or the least disruption to the Owner's operations. If an interruption of operations is unavoidable, then this Work will be scheduled with the Owner through CM.

9.4. Contractors is responsible to provide temporary utilities and systems to maintain services to the facility while Work is being performed.

9.5. No interruptions to Owner's power, lighting, signal, or alarm circuits will be permitted without the express written permission of the Owner through CM. Arrangements for interruptions shall be made with the Owner at least forty-eight (48) hours prior to the interruption and shall be made at such time and duration as authorized by them. Temporary feeders, transformer jumpers, connections, circuits, etc., shall be used as required to accomplish the above at no additional cost to the Owner and CM.

10 MATERIAL STORAGE

10.1. All Contractors are required to provide and pay for off-site storage facilities as required for their Work.

10.2. All Contractors will not be allowed on-site storage facilities. Material, equipment and tools, shall not be stored on-site in excess of five (5) working days prior to installation or use without CM's approval.

10.3. Storage of combustible materials within or adjacent to the building is prohibited.

10.4. All Contractors shall

10.4.1. Stock the job with sufficient materials to maintain progress and schedule and without interfering with the Work or storage of others.

10.4.2. Assume full responsibility for the protection and safekeeping of products under their control which are stored on the site.

10.4.3. Move any stored products under their control, which interfere with operations of the Owner or separate contractors as directed by CM.

10.4.4. Provide sufficient protection for its materials and equipment from damages by weather or construction work or other hazards.

10.4.5. Remove all debris and leave the area in a clean and orderly condition during progress of Work and upon completion of the Work.

10.4.6. Submit a receipt of shipment for all equipment stored on-site or off-site to CM. No materials or equipment shall be removed from the site without the permission of CM

END OF SECTION 01140

SECTION 01250
CHANGES IN THE WORK

1 SUMMARY

1.01 This section describes the following requirements including:

1.01.1 Types of Change Documentation

1.01.1.1 PCO – Potential Change Order

1.01.1.2 CO – Change Order

1.01.2 Compensation of Overhead and Profit for Changes in the Work

1.01.3 Itemization of Cost of Changed Work

1.02 This section is not intended to include RFI's, ASI's (Architects Supplemental Instructions), or other documents that clarify the work but have no substantive cost or schedule impact to the work.

2 TYPES OF CHANGE DOCUMENTATION

Changes to the work which may involve a change in the contract price or schedule will be accompanied by the Barton Malow form entitled "PCO- Quotation Only". In the event that the timing does not allow the For Quote Only process, then CM will issue its form entitled "PCO–Notice to Proceed. "

2.1. PCO- NOTICE TO PROCEED AND FOR PCO- QUOTATION ONLY FORMS

2.1.1. A PCO- Notice to Proceed is used when Work must be performed with swiftness and authorization to proceed by Change Order is inappropriate due to time restrictions. In order for a PCO- Notice to Proceed to be valid, it must be signed by CM. The terms for establishing the additional cost and processing of the PCO- Notice to Proceed into a Change Order shall be identified prior to its release by CM.

2.1.2. If a change results in a change in cost, CM will issue a PCO with the supporting change documents.

2.1.3. Contractor shall prepare a detailed cost quotation for the PCO. This quotation shall include an itemized takeoff of labor, equipment and material with a unit cost for each item together with backup and breakdown documentations satisfactory to CM. The PCO must be returned as directed

2.1.4. Contractor shall sign and date the PCO and submit it with proper backup. The PCO will then be reviewed, evaluated, negotiated and then, when acceptable, processed

2.1.5. The PCO- Quotation Only is a document used for processing Contractor's quotations and is **not** a Change Order. Therefore, completion of the PCO- Quotation Only does **not** release the Work to begin.

2.1.6. PCO's will precede a Change Order. Contractors shall receive an approved PCO- Notice to Proceed or an executed Change Order before starting Work. Any changed Work performed by Contractor without a properly executed PCO- Notice to Proceed or a properly executed Change Order is at Contractor's sole risk and expense. BILLINGS AGAINST CHANGES WILL NOT BE ACCEPTED AFTER A PCO- NOTICE TO PROCEED OR FOR QUOTE ONLY IS ISSUED, BUT ONLY AFTER A CHANGE ORDER HAS BEEN PROCESSED AND SIGNED BY ALL PARTIES.

2.2. CHANGE ORDER

2.2.1. Change Orders will be issued by CM. CM will first issue the Change Order to the Contractor for signature. The Change Order will then be returned to CM. Once all appropriate signatures are secured, an executed copy will be sent to the Contractor**.**

2.2.2. Once the Change Order has been processed and signed by all parties, the Contractor may invoice for payment on the completed portion of Work.

2.2.3. Agreement on a Change Order shall constitute a final settlement of all matters relating to the changed Work that is the subject of the Change Order.

3. COMPENSATION OF OVERHEAD AND PROFIT FOR CHANGES IN THE WORK

3.1. CONTRACTOR'S OVERHEAD AND PROFIT

3.1.1. For changes resulting in increase of cost:

3.1.1.1. Overhead and profit for the Contractor shall not exceed the following when change Work is performed by

3.1.1.1.1. Contractor itself: fifteen percent (15%).

3.1.1.1.2. Contractor subordinate party: five percent (5%)

3.1.1.2. Overhead and profit for the subordinate party shall not exceed the following when change Work is performed by

3.1.1.2.1. Subordinate party itself: fifteen percent (15%)

3.1.1.2.2. Contractor to the subordinate party: five percent (5%)

3.1.2. For changes resulting in reduction of cost

3.1.2.1. Deductive costs shall include commensurate deductive credits for overhead and profit based on the percentages stated above.

3.1.3. Contractor's and Subordinate Party's overhead and profit shall include cost (at the Project Site, home office and otherwise) of supervision, telephone, travel, copying, administrative services, office, power, light, tools, jobsite vehicles, and all other general expenses including bond premiums. In no event shall these items be charged as cost of the Changed Work.

4. ITEMIZATION OF COST OF CHANGED WORK

4.1. EXTRA WORK TICKETS

4.1.1. If extra work is to be completed above and beyond the terms of the contract, as determined by (and approved in advance by) the CM, the Contractor is required to:

4.1.1.1. Provide an Extra Work Order ticket to the CM within three (3) days of completing the work.

4.1.1.1.1. Extra Work Order tickets will be rejected if they are not turned in to the CM within three (3) days of completing the work.

4.1.1.1.2. Extra Work Order tickets are to be completed in triplicate and a copy is to be left with the CM.

4.1.1.1.2.1. The CM will sign all copies of the Extra Work Order tickets and return two (2) to the Contractor in a prompt manner, keeping one for record.

4.1.1.1.3. A copy of the signed ticket(s) must accompany the Request for Change Order(s) quote from the Contractor. A change order will not be processed and the Request for Change Order(s) will be rejected if there is no signature from the CM.

4.1.1.2. Provide the CM with a Request for Change Order for the extra work within ten (10) days of receiving the signed ticket.

4.1.1.2.1. The Request for Change Order must be accompanied by a copy of the signed Extra Work Order ticket from the Contractor.

4.1.1.2.2. The Request for Change Order will be rejected and no PCO or Change Order will not be processed if the quote is not received within ten (10) days of the date signed by the CM.

4.2. CORRELATION WITH CONTRACTOR'S SUBMITTALS

4.2.1. Contractors shall

4.2.1.1. Revise the Schedule of Values and Request for Payment forms to record each Change Order as a separate item of Work, and to record the adjusted contract price.

4.2.1.2. Revise the Construction Schedule to reflect each change in Contract Time approved by a Change Order.

4.2.1.3. Revise sub-schedules to show changes for other items of Work affected by the changes.

4.2.1.4. Enter and revise Record Documents to reflect changes

4.3. COST OF THE CHANGED WORK

4.3.1. The "Cost of the Changed Work" shall be approved by CM and shall mean the costs necessarily incurred by the Contractor in the proper performance of the Changed Work. Such rates shall not be higher than those customarily paid at the place of the Project. The Cost of the Changed Work shall only include those items set forth below.

WAGES OF LABOR	Wages of construction workers directly employed by Contractor to perform the construction of the changed Work at the site
PAYROLL MARKUP	The amount approved by CM and Owner which covers the costs paid by the Contractor for taxes, insurance, contributions, assessments, and benefits required by law or collective bargaining agreements and for personnel not covered by such agreements, customary benefits such as sick leave, medical and health benefits, holidays vacations and pensions, provided that such costs are based on the wages and salaries of labor performing the changed Work.
COST OF EQUIPMENT, MATERIALS, AND SUPPLIES	Costs of materials, equipment and supplies to be incorporated into the changed Work less all savings, discounts, rebates and credits accruing to the Contractor.
RENTAL CHARGES FOR EQUIPMENT NOT OWNED BY CONTRACTOR	Rental charges for equipment not owned by Contractor that is necessary for completion of the Changed Work. Rates and quantities rented must be approved in advance by CM.
TAXES	Sales or use taxes imposed by a governmental authority which are directly attributable to the changed Work and for which the Contractor is liable.
SUBORDINATE PARTY COSTS	Payments made to the Contractors for proper execution of Changed Work, subject to the limits set forth above for overhead and profit.

4.2.2. In no event shall the Cost of Changed Work include:

4.2.2.1. Salaries or wages of persons other than those directly performing the changed Work, including Contractor's personnel stationed at the principal office;
4.2.2.2. Expenses of the Contractor's principal office and offices other than the site office, except as provided above;
4.2.2.3. Overhead and general expenses of any nature, except as set forth above;
4.2.2.4. Capital expenses of Contractor, including interest on the Contractor's capital employed for the Changed Work;
4.2.2.5. Rental costs for machinery or equipment, except as allowed above, or tools of any kind, unless specifically identified and approved in advance in writing by CM;
4.2.2.6. Costs due to the negligence or failure to perform of the Contractor or its Subordinate Parties;
4.2.2.7. Costs designated above as being included in Overhead and Profit
4.2.2.8. Any cost not specifically described above, or otherwise approved in advance and in writing by CM and Owner.
4.2.2.9. Any bond premiums of portion of increased bond costs directly attributable to the changed Work.

4.3. QUOTATION FORMAT

Based on the above, the following formula will be utilized by all of the Contractors.

Number of PCO_____ _____
Date of PCO_____ _____
Description of Change _____
_____
_____
_____

Cost of Changed Work

Labor:				
Carpenter	(No. of Hrs. x Rate)	xxx.xx		
Labor	(No. of Hrs. x Rate)	xxx.xx		
Ironworker	(No. of Hrs. x Rate)	xxx.xx		
	Subtotal		xxx.xx	
	OH&P @ 15%		xxx.xx	
Equipment, Materials, Supplies:				
Ace Hardware	xxx.xx			
Acme Products	xxx.xx			
Concrete Supplier		xxx.xx		
		xxx.xx		
	Subtotal		xxx.xx	
	OH&P @ 15 %		xxx.xx	
	Subtotal (1)			**xxx.xx**
Contractor Costs				
ABC Welding	xxx.xx			
XYZ Resteel		xxx.xx		
	Subtotal		xxx.xx	
	OH&P @ 5 %		xxx.xx	
	Subtotal (2)			**xxx.xx**

TOTAL QUOTATION AMOUNT

Total Quotation (Subtotal 1 plus Subtotal 2)	**xxx.xx**

END OF SECTION 01250

SECTION 01290
PAYMENT PROCEDURES

1. SUMMARY

1.1. This Section describes the following requirements including:

1.1.1. Schedule of Values

1.1.2. Application for Payment Process

1.1.3. Reduction of Retention

1.1.4. Payment for Materials Stored Off-site

1.1.5. Waivers of Lien and Sworn Statements

2. PAYMENT PROCEDURES

2.1. SCHEDULE OF VALUES

2.1.1. Once the Agreement is awarded, each Contractor must submit a Schedule of Values for its entire Work to CM for approval. This Schedule of Values must be submitted either within fifteen (15) days of award or fifteen (15) days prior to the first payment application deadline (per the Application for Payment Schedule), whichever comes first. The Schedule of Values must include labor and material line items for each portion of the Work (larger portions of Work such as concrete, curtainwall, drywall, mechanical, and electrical shall be broken down by elevation, floor, and areas appropriate), the Contractor shall separate bond costs, and general conditions line items as appropriate.

2.1.2. The Schedule of Values will be submitted in a format as prescribed by, and to the level of detail specified by, CM.

2.1.2.1. The sum of the parts of the Schedule of Values shall equal the contract price.

2.1.2.2. The minimum level of breakdown and order on the application for payment will be:

2.1.2.2.1. Bond costs, if applicable

2.1.2.2.2. General conditions line item(s)

2.1.2.2.3. Division 1 cost breakdown as required

2.1.2.2.4. Costs associated with preparation of closeout paperwork and documentation

2.1.2.2.5. Major portions of the Work shall be broken down into labor and material line items for specific areas of the facility

2.1.2.2.6. A listing of approved and executed Change Orders to the Contract, if any, in sequential order.

2.1.2.3. Schedule of Values items shall have a direct and understandable relation to the Project master construction schedule.

2.1.2.4. Overhead and profit shall be listed as a separate line item on the schedule of values.

2.1.3. The Schedule of Values, unless objected to by CM, Owner or Architect, shall be the basis for the Contractor's application for payments.

2.1.4. CM shall have the right to require the Contractor to alter the value or add/delete categories listed on the Schedule of Values at any time for the following reasons:

2.1.4.1. The Schedule of Values appears to be incorrect or unbalanced.

2.1.4.2. A revision of the Schedule of Values is required due to the Contractor revising the sequence of construction or assembly of building components that in turn invalidates the Schedule of Values.

2.1.4.3. Change Orders are issued to the Contractor and shall be incorporated into the Schedule of Values as a separate line item at the bottom of the Schedule of Values.

2.1.5. The Contractor is required to correlate the documentation for payment of stored materials requested in the application for payment against the agreed upon breakdown of the Schedule of Values as described in Payment for Stored Materials. CM reserves the right to not process the application for payment if this correlation has not been submitted in conjunction with the application.

2.2. APPLICATION FOR PAYMENT PROCESS

2.2.1. Step 1: JOB-SITE INSPECTION - DRAFT PAYMENT REQUEST

2.2.1.1. The Contractor shall

2.2.1.1.1. have a representative walk the Project site with CM's representative on or before the tenth (10^{th}) of the month,

2.2.1.1.2. invoice for Work from the tenth (10^{th}) of last month to the tenth (10^{th}) of the present month.

2.2.1.1.3. submit during the review, the itemized rough draft of the Application and Certificate for Payment (AIA Documents G702 and G703 Continuation Sheet) identifying the Work completed, if any, during the current calendar month; shall review same with CM and obtain a preliminary approved copy of the draft for official submission

2.2.1.1.4. Contractor's pay application shall only reflect Work completed through the date of submission. In no event will payments be authorized for forecasted Work.

NOTE: No payment shall be issued to a Contractor for materials stored off-site unless supported by proper documentation as required by CM (upon advance notification of such requests only) as described in Part 3 Payment for Stored Materials.

2.2.2. Step 2: PAYMENT REQUEST PREPARATION/SUBMISSION

2.2.2.1. With the information agreed upon in Step 1, the Contractor will prepare a formal application for payment request.

2.2.2.2. Final electronic copies are due to CM on or before the fifteenth (15^{th}) of the month.

2.2.2.3. Late or incomplete application packets will not be accepted.

2.2.2.4. The payment request will be made on an Application and Certificate for Payment form (AIA documents G702 and G703).

2.2.2.5. Before submitting these documents to CM, each request for payment must be signed by a duly authorized agent of the Contractor and notarized.

2.2.2.6. The Contractor must include with each request for progress payment a waiver of lien for all previous payments, Contractor's sworn statement and any necessary backup data as described in Part 4, Waivers of Lien and Sworn Statements.

2.2.2.7. In addition, at submission of the final pay application Contractor shall provide unconditional final waivers of lien for all Subordinate Parties, as well as all close out documentation and all additional back up data described in Part 4, Waivers of Lien and Sworn Statements.

2.2.2.8. In requests for payment which follow the execution of a Change Order in excess of twenty-five percent (25%) of the Agreement price, Contractor must present a bond

rider evidencing that the penal sum of any required payment and performance bonds have been increased to one hundred percent (100%) of the adjusted Agreement price, or such other percentage as set forth in Section 00200 of the Project Manual, Instructions to Bidders. Submission of the required back-up data is a condition precedent to payment.

2.2.3. Step 3: CHECK DISTRIBUTION

2.2.3.1. CM will issue individual checks to each Contractor. The Contractor will receive the waiver of lien with the check and will be required to sign three (3) originals of the waiver upon receipt of the check each month (see Part 4).

2.2.3.2. The Contractor shall provide all supporting documentation substantiating the Contractor's right to payment as the Owner, CM and the Architect may require.

2.3. REDUCTION OF RETENTION

2.3.1. CM shall be entitled to withhold ten (10%) percent of each payment due to a Contractor until Substantial Completion of the Contractor's Work.

2.3.2. The Contractor, when requesting a reduction of retention, shall submit to CM, an AIA G707, Consent of Surety to Reduction In or Partial Release of Retention form in Section 01600 Forms.

2.3.3. Within thirty (30) days after Certificate of Substantial Completion has been issued for all portions of its Work, the Contractor's retention may be reduced to a sum as CM/the Architect may determine is suitable to protect CM and the Owner for all incomplete Work and any unsettled claims.

2.3.4. Notwithstanding the foregoing, payment of retention shall be subject to all other conditions precedent that applies to payment as set forth in the Contract Documents.

3. PAYMENT FOR MATERIALS STORED OFF-SITE

3.1. PAYMENT FOR MATERIALS STORED OFF-SITE

3.1.1. The Contractor, if intending to use an off-site storage area or facility for stored materials, shall submit a written request to the CM and obtain approval prior to submitting the first application for payment as described in Part 2 Applications for Payment.

3.1.2. Payments will be made for materials properly stored off site.

3.1.2.1. "Properly stored" shall mean in an insured warehouse with the Owner and CM being named as insureds, and all material identified as property of the Owner.

3.1.2.2. The Contractor is responsible for all associated off site storage costs, transportation, insurance, including insurance coverage for stored material, while in transit, unless Contractor obtains written documentation that the material is covered during transit under a Builder's Risk Policy applicable to the Project.

3.1.2.3. Contractor shall provide CM and the Owner verification in writing for all material so stored. Such materials shall be protected from diversion, destruction, theft, and damage to the satisfaction of CM, Owner and the Lender (if any), specifically marked for use on the Project, and segregated from other materials at the storage facility.

3.1.2.4. The Contractor bears all risk of loss to materials and equipment stored off site.

3.1.3. Contractor is to provide supporting documentation in the form of invoices, insurance policies, and any other pertinent documentation as requested by CM or Owner for items the items stored off-site. Documentation shall include the following:

3.1.3.1. Detailed description of the material including quantities that will serve as a material description for the billing and as information to file a claim with an insurance company.

3.1.3.1.1. Stored Materials - Each item must be identified as to manufacturer, model number, and serial number, if applicable, or other identifiers should be listed for each item. Each listing must be accompanied by invoices, shipping tickets, consent of surety, and any other applicable supporting documentation.

3.1.3.1.2. Stored Manufactured Building Materials - Each item must be identified as to type, manufacturer's number or designation, and should also list the number of cartons and the contents therein storage. Each listing must also be accompanied by supporting documents including all invoices, shipping tickets and consent of surety.

3.1.3.1.3. Stored Fabricated Materials - A listing specifying the number of pieces, items, and marks as may be applicable to the particular type of items. Photographs should accompany the request.

3.1.3.2. Individual itemized costs of materials and the total cost value, which shall not exceed the Contractor's subcontractor or material supplier cost. The total cost value shall be supported by the Contractor's subcontractor or material supplier invoices for the stored material.

3.1.3.3. Estimated cost value for those materials that are fabricated by the Contractor's subcontractor or material supplier.

3.1.3.4. The location where the material is physically stored, including the warehouse address and storage location within the warehouse, such as bin number, aisle number or other designation. All material shall be segregated and marked.

3.1.3.5. Copies of the insurance policies that cover the stored materials and that name CM and the Owner as insureds. The limit of the insurance policy shall be equal to or greater than the replacement value of the stored materials.

3.1.4. When Applications for Payment include products stored off the Project Site or stored on the Project Site but not incorporated in the Project, for which no previous payment has been requested, a complete description of such product shall be attached to the application.

3.1.5. Contractor shall submit a certificate of title listing the Owner's ownership in the off-site stored materials equal to the amount paid effective at the time funds are delivered.

3.1.6. If the size, quantity, and/or type of material or product is such that a bonded warehouse is deemed unsuitable, then, with CM's approval, the Contractor may elect to prepay its subcontractor or supplier for certain material and products which are to remain on and be stored on that subcontractor/supplier's premises until needed by the Project. In such event, the Contractor shall enter into a security agreement with the subcontractor/supplier under which the Contractor shall be granted a security interest in and to all such material and products fabricated and/or to be supplied by the subcontractor/supplier for this Project and stored on the subcontractor/supplier's premises. This Security Agreement shall be a part of the financing statement, which shall be presented to a filing officer for filing pursuant to the Uniform Commercial Code. All expenses incurred in obtaining this security agreement shall be at Contractor's sole cost and expenses, and shall not accrue to the Owner, CM, Architect, nor the Project. A copy of each and every security agreement shall be filed with CM with the first Application for Payment which requests payment for such material or products.

3.1.7. All payment requests for off-site stored materials must be accompanied using the "Payment Request for Stored Materials" and a "Subcontractor Affidavit for Stored Materials." Payment requests for stored materials not complying with the foregoing requirements will not be approved. Contractors are to notify the CM in ample time to conduct verification procedures.

3.1.8. Contractors may not apply the cost of materials stored off-site towards a reduction in the retention amount.

3.1.9. Representatives of CM and Owner shall have the right to make inspections of the storage areas at any time.

4. WAIVERS OF LIEN AND SWORN STATEMENTS

4.1. WAIVERS OF LIEN

4.1.1. The Contractor's first Application for Payment will be based upon 100 percent of the value of Work installed. The first payment, amounting up to 90 percent of application, will be made to the Contractor without supporting documentation. Subsequent Applications for Payment must be accompanied by lien waivers from the Contractor, its Subordinate Parties or receipted invoices covering payment to the Contractor for previous calendar month period. Lien waivers must be unconditional and must show the amount paid.

4.1.2. An "Acknowledgment of Payment and Partial Unconditional Release" will be distributed with the check to each Contractor by CM for payment of the previous month's application. The Waiver of Lien is to be signed by an authorized representative of the Contractor. Under no circumstances will payment be released until the completed "Acknowledgment of Payment and Partial Unconditional Release" has been submitted and signed by the Contractor from the previous month.

4.1.3. Final payment will not be made until a "Final Release Subcontractor/Materialman has been submitted. This will also be distributed by the CM for Contractor signature and must be returned by the Contractor. The Final Release must be signed by an authorized representative of the Contractor and must be notarized.

4.1.4. Final unconditional waivers will be required for all of Contractor's Subordinate Parties listed on Contractor's sworn statement. These final waivers must be submitted along with the final release, before payment can be made.

4.2. SWORN STATEMENTS

4.2.1. The appropriate number of original "Sworn Statements" must be completed to the satisfaction of CM, signed and notarized by an authorized representative of the Contractor and submitted with the Contractor's Application for Payment, monthly to the CM.

4.2.2. The Contractor's Subcontractor's sworn statements, waivers and other supporting documentation will be required with each pay application.

END OF SECTION 01290

SECTION 01310
MEETINGS

1. GENERAL

1.1. DESCRIPTION OF REQUIREMENTS

1.1.1. The CM shall schedule, chair, and administer all periodic meetings throughout the progress of the work for the purpose of coordinating and expediting the Work. Such meetings shall be held at the job site bringing together responsible representatives of active Contractors for the purpose of planning, assessing progress and discussing problems of mutual concern. Each Contractor, and its Subordinate Parties' representative attending the meetings shall be authorized to act on behalf of and make decisions/commitments for the entity each represents, the decisions made at the meetings and each Contractor who should be in attendance will be held responsible for information and directions given at the meeting.

1.1.2. The CM will prepare and distribute the minutes of all meetings, if CM determines minutes are required. If the attendees do not object in writing to any part of the meetings within ten (10) days of distribution of the minutes, the minutes shall be accepted as written.

1.1.3. The scope of meetings include, but are not limited to:

1.1.3.1. Preconstruction Meeting

1.1.3.2. Job Progress/Coordination Meetings

1.1.3.3. Other Meetings

2. TYPES OF MEETINGS

2.1. PRECONSTRUCTION MEETING (KICK-OFF)

2.1.1. A Preconstruction (kick-off) meeting will be conducted with representatives of all the Contractor**s** within fifteen (15) days after the Agreement is awarded at the jobsite or as designated by the CM. The agenda may include:

2.1.1.1. Discussion on major subcontracts and suppliers

2.1.1.2. Major and/or critical work sequencing regarding the project schedule

2.1.1.3. Project coordination and designation of responsible personnel

2.1.1.4. Procedures and processing of field instructions, requests for proposal, submittals, change orders, applications for payment, etc.

2.1.1.5. Quality assurance/control issues

2.1.1.6. Adequacy of distribution of contract documents

2.1.1.7. Procedures for maintaining record documents

2.1.1.8. Use of premises, office, work and storage areas and other CM requirements

2.1.1.9. Construction facilities/temporary utilities

2.1.1.10. Safety and security procedures

2.1.1.11. Other administrative procedures

2.1.1.12. Review of Owner expectations

2.2. JOB PROGRESS/COORDINATION MEETINGS

2.2.1. On-site project coordination/progress meetings will be held on a bi-weekly basis or as appropriate throughout the life of the Project. The [CM/Owner] will set the agenda for the Project progress meeting. At a minimum, each Contractor shall be prepared to discuss the following**:**

2.2.1.1. Actual vs. scheduled progress for the prior two-week period

2.2.1.2. Planned construction activities for the next four weeks

2.2.1.3. Problems with, revisions to and corrective measures and procedures to regain the construction schedule, if required

2.2.1.4. Review of off-site fabrication, delivery schedules

2.2.1.5. Document clarification requests

2.2.1.6. Coordination items with other Contractors

2.2.1.7. Changes in the work affecting cost and/or time

2.2.1.8. Submittals and shop drawings

2.2.1.9. Field observations, problems, conflicts

2.2.1.10. Quality control issues and non-conformance resolutions

2.2.1.11. Safety issues

2.3. OTHER MEETINGS

2.3.1. QUALITY ASSURANCE MEETINGS - CM may conduct quality assurance/quality control meetings as necessary during the progress of the Work. CM will set the agenda for the quality meeting. At a minimum, the Contractor shall be prepared to discuss the following:

2.3.1.1. Testing and inspection procedures

2.3.1.2. Tolerance requirements

2.3.1.3. Quality samples

2.3.1.4. Reporting of non-conformance items

2.3.1.5. Corrective actions assigned

2.3.1.6. Disposal of non-conforming items

2.3.1.7. Job procedures

2.3.2. SAFETY MEETINGS - Refer to Section 00810 Safety and Loss Control Program for more information.

2.3.3. INSPECTIONS TOURS - Formal inspections/tours may be made of the Project progress by the Owner, Architect, local, state or federal officials, insurance representatives, or others as the occasion warrants and as scheduled by CM. If requested by CM, each Contractor shall be prepared to show and explain Work throughout the building to the inspecting parties, in addition to providing Work in compliance with these inspections.

2.3.4. CHANGE REQUEST MEETINGS - Upon issuance of a major Proposal Request (a.k.a. bulletin), CM may conduct a meeting as necessary with all significant Contractors to review its contents and determine cost, delivery and schedule impacts. At a minimum, the Contractor shall be prepared to discuss the following:

2.3.4.1. Impact of out-of-sequence work

2.3.4.2. Identification of pertinent long-lead material and system impact

2.3.4.3. Alternative recommendations

2.3.4.4. Evaluation of approximate cost magnitude

2.3.4.5. Evaluation of impact on completion

2.3.4.6. Alternate sequencing

2.3.4.7. Due date for Contractor pricing and scheduling impact

END OF SECTION 01310

SECTION 01320
COMMUNICATIONS

1. SUMMARY

1.1. This Section describes the following requirements including:

1.1.1. Meetings / Communications

1.1.2. Contractor Correspondence

1.1.3. Contractor's Daily Report

1.1.4. Request for Information (RFI)

2. METHODS OF COMMUNICATION

2.1. MEETINGS (previous Section 01310 – Meetings)

2.1.1. The CM shall schedule, chair, and administer all periodic meetings throughout the progress of the work for the purpose of coordinating and expediting the Work. Such meetings shall be held at the job site office bringing together responsible representatives of active Contractors for the purpose of planning, assessing progress and discussing problems of mutual concern. Each Contractor, and its Subordinate Parties' representative attending the meetings shall be authorized to act on behalf of and make decisions/commitments for the entity each represents, the decisions made at the meetings and each Contractor who should be in attendance will be held responsible for information and directions given at the meeting.

2.1.2. The CM will prepare and distribute the minutes of all meetings, if CM determines minutes are required. If the attendees do not object in writing to any part of the meetings within ten (10) days of distribution of the minutes, the minutes shall be accepted as written.

2.1.3. The scope of meetings include, but are not limited to:

2.1.3.1. Preconstruction Meeting

2.1.3.2. Job Progress/Coordination Meetings

2.1.3.3. Other Meetings

2.1.3.3.1. Quality Assurance

2.1.3.3.2. Safety

2.1.3.3.3. Inspection Tours

2.1.3.3.4. Change Request

2.2. CONTRACTOR CORRESPONDENCE

2.2.1. All field and/or construction correspondence and/or communications must be directed through CM. All correspondence should list the following as appropriate:

2.2.1.1. Project Name: **Troy School District – 2013 Bond Program – Series 2, Bid Package 21A –general trades items at Costello, Martell, Morse and Leonard**

2.2.1.2. CM Job#: 140077

2.2.1.3. Architect Job#: 13157B.1, 13158A.1, 13167A.1, 13173A.1, 13175E, 13178A

2.2.1.4. Contractor Contact Information

2.2.1.5. Subject: clearly indicate subject matter of correspondence

2.3. CONTRACTOR'S DAILY REPORT

2.3.1. Each Contractor will prepare and distribute daily to CM a comprehensive daily report to include pre-task planning and maintain it during the entire project period. The daily report shall be

submitted to CM's superintendent by the end of the day for that day's Work. Each Contractor is responsible for specifically alerting CM to items which could result in claims or delays.

2.3.2. Each Contractor may provide its own daily report if it covers the same issues as addressed in CM's Contractor Daily Report / Pre-Task Plan form. The CM suggested report form will be provided to the Contractor and is in Section 01600 - Forms.

2.4. REQUEST FOR INFORMATION (RFI)

2.4.1. The Request for Information (RFI) is in Section 01600 Forms.

2.4.2. In the event that a clarification is required due to a question raised by the Contractor pertaining to the Contract Documents, the Contractor shall submit a Request for Information (RFI) to the CM, which will be forwarded to the Architect. The RFI should be sufficiently detailed to accurately describe the problem and provide a possible solution.

2.4.3. The Architect will return the RFI to CM as expeditiously as possible with its reply. In some instances, the Architect may issue its reply to the RFI on other documents, in which case, the RFI will simply reference these documents.

2.4.4. The RFI will be returned to the Contractor by CM. The Contractor is responsible to give proper notice as set forth in the Contract Documents if a response will cause the Contractor to incur additional expense or expend additional time which could impact the schedule. If extra work or an additional cost may exist due to the clarification, CM may issue a PCO- Quotation Only or PCO-Notice to Proceed to the Contractor.

END OF SECTION 01320

SECTION 01330
SUBMITTALS

1 SUMMARY

1.1. This Section describes the following requirements including:

1.1.1. Scope

1.1.2. Submittal Register

1.1.3. Submittal Requirements

1.1.4. Submittal Process and Responsibilities

1.1.5. Re-submission Requirements

2 SCOPE

2.01 Where requirements of this Section vary from the requirements of the General Conditions, this Section's requirements shall take precedence.

2.02 CM will prepare and submit a submittal register/schedule including close-out documentation for Contractor's use in preparing submittals required for the Project. Contractors shall complete the submittal schedule/register showing the dates for submission, lead times required and their expected delivery dates to maintain and follow the construction schedule. Dates for submission noted by Contractor must assume re-submittals will be required. Submittals received on the date scheduled will be processed as specified. CM/Owner/Architect will not be held responsible for delays due to receiving submittals after the date indicated in the Contractor's submittal schedule.

2.03 Submittals shall be submitted based on each technical specification section. Submittals containing information about more than one specification section will be returned for re-submittal.

2.04 Contractor is responsible to provide all submittals required under the Contract Documents, whether or not listed in the submittal register.

2.05 Furnish approved copies of shop drawings, diagrams, templates, catalog cuts, technical data, etc. to others for the purposes of coordination of this Work.

2.06 Coordination: Each Contractor shall coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

2.06.1 The Contractor, by providing the submittal assures the product or system submitted is available and deliverable in accordance with the schedule requirements.

2.06.2 Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.

2.06.3 Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

2.06.4 CM reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

2.06.5 Coordinate each submittal as required with all trades and with all public agencies involved.

2.06.6 Secure all necessary approvals from public agencies and others; signify by stamp or other means that all required approvals have been obtained.

2.06.7 Material Compliance Certificate:

2.06.7.1 The following forms are available upon request from the CM:

2.06.7.1.1 Material Compliance Certificate

2.06.7.1.2 Approved Submittal List for Material Compliance Certificate Use

2.06.7.2 Contractors may choose to complete the *Material Compliance Certificate* form which will serve as the Contractor's official submittal document and must meet all general submittal requirements. Only approved submittals listed on the *Approved Submittal List for Material Compliance Certificate Use*, prepared by CM, will be reviewed in this format.

2.06.7.3 Items available to utilize the Material Compliance Certificate can include a submittal that establishes a level of quality by complying with the manufacturer and manufacturer's designated identifier as called for in the Contract Documents. The Contractor is committed to using this exact specified component. This Certificate is contractually binding.

2.06.7.4 This form can be used for multiple submittal items. The Architect/Engineer will review and approve the Material Compliance Certificate in the same manner as a standard submittal.

2.06.7.5 In the event additional information would be required after submission and/or approval of the Material Compliance Certificate, the Contractor must provide this information promptly through the standard revision process.

3. SUBMITTAL REQUIREMENTS

3.1. GENERAL

3.1.1. Each submittal shall show Contractor's review stamp, with handwritten signature, certifying review of the submittal, verification of field measurements and compliance with the Contract Documents.

3.1.2. Each submittal shall be accompanied with a Submittal Transmittal Form. The following information shall be furnished by the Contractor on the submittal transmittal form:

3.1.2.1. Original Date of submission and Revision Date(s).

3.1.2.2. Project name and Architect's and the CM's project number

3.1.2.3. Names of:

3.1.2.3.1. Contractor

3.1.2.3.2. Second-Tier Contractor (if applicable)

3.1.2.3.3. Supplier

3.1.2.3.4. Manufacturer

3.1.2.4. Identification of product or material

3.1.2.5. Technical Section number, clearly identified. On multiple submittals, a separate transmittal should be completed for each specification section on items being submitted.

3.1.2.6. Reference to construction drawings by drawing number

3.1.2.7. The quantity of each Shop Drawing, Product Data or Sample submitted

3.1.2.8. Notification of deviations from Contract Documents

3.1.2.9. For Shop Drawings, show relationship to adjacent structure or materials

3.1.2.10. For Shop Drawings, show field dimensions, clearly stated as such.

3.1.2.11. Applicable standards such as ASTM or Federal Specifications.

3.1.2.12. Other pertinent data

3.1.2.13. Submittals not so transmitted will be returned un-reviewed. Re-submissions shall be so noted on the transmittal.

3.1.3. Unless noted otherwise on the submittal, all submissions will be considered to be "as specified."

3.2. REQUIRED QUANTITIES OF SUBMITTALS (ELECTRONIC REVIEW VERSION)

3.3.1. In general, all submittals, except color or physical samples, are to be posted electronically in PDF document form for CM and the Architect/Engineer to electronically review and approve. CM will use Submittal Exchange as a posting site for the facilitation of this review and approval process. The following number of originals and copies will be required for each type of submittal.

	Required submit quantities:		
Submittal Type:		**Electronic[1]**	**Other**
.1 Shop Drawings – Structural Steel and all MEP		**1**	
.2 Shop Drawings – all other		**1**	
.3 Product Data – Structural Steel and all MEP		**1**	
.4 Product Data – all other		**1**	
.5 Samples		**1**	**4**
.6 Certificates[2]		**1**	
.7 Warranties / Guarantees[2]		**1**	
.8 Test Reports[2]		**1**	
.9 Close-Out Material: O & M Data[2]		**1**	

NOTES :
[1] ALL electronic submittals shall be in PDF format
[2] Items #6-9 above are to be submitted together as part of the Close-Out Packet when requested by CM

3.3.2. All submittals will be reviewed electronically via Submittal Exchange, and an electronic submittal transmittal is required. Reviewed versions will be posted back to Submittal Exchange. CM will notify Contractor of the posting and availability for Contractor to download the reviewed version. Paper copies will not be returned to the Contractor.

4. TYPES OF SUBMITTALS

4.1. SHOP DRAWINGS

4.1.1. Provide Shop Drawings as complete submittals (no partial sets) on original drawings or information prepared solely by the fabricator or supplier. In no instance shall the Contract Drawings be reproduced for Shop Drawing submittals.

4.1.2. Sheet sizes shall not exceed the size of the Contract Drawings or smaller than 8-1/2" X 11".

4.1.3. Each drawing shall have blank spaces large enough to accept three (3) 3" x 6" review stamps of the Contractor, the CM, and the Architect.

4.2. PRODUCT DATA

4.2.1. Modify Product Data sheets to delete information that is not applicable to the Project. Provide additional information if necessary to supplement standard information.

4.2.2. Product Data Sheets that are submitted with extraneous information not deleted and/or modified will be returned without review to the Contractor for re-submittal.

4.3. SAMPLES

4.3.1. Provide physical Samples to illustrate materials, equipment or workmanship, and to establish standards by which completed work may be judged as required by the technical section.

4.3.2. Provide Office Samples in sufficient size or as defined in the technical specifications and quantity to clearly illustrate full range of colors, textures, etc. available and the functional characteristics of the product or material.

4.3.3. Erect Field Samples or mock-ups as required by the technical sections and/or CM, at the Project site in a location designated by CM. Construct field samples complete, including Work of all trades required in finishing the Work. Provide Field Samples at the request of the Architect and/or CM where construction materials and/or methods deviate from the requirements of the intent of the Contract Documents or conventional construction practice.

4.4. CERTIFICATIONS

4.4.1. Certifications shall clearly identify the materials in reference and shall state that the material and the intended installation methods, where applicable, are in compliance with the Contract Documents for this project. Attach manufacturer's affidavits where applicable.

4.5. WARRANTEES/GUARANTEES

4.5.1. Provide warrantees and/or guarantees as required by the various technical sections and other Contract Documents on the Contractor's letterhead in accordance with the requirements of the documents.

4.5.2. Refer to Section 01700 for additional close-out information and requirements including the standard CM Contractor's Guarantee Form that must be signed, without modification, in order to receive final payment. A copy of this form is either found in Section 01600 or is available upon request.

4.6. OPERATING AND MAINTENANCE MANUALS

4.6.1. Provide operating and maintenance manuals/data as required by the various technical sections in accordance with the requirements of the documents.

5. SUBMITTAL PROCESS AND RESPONSIBILITIES

5.1. Contractor's RESPONSIBILITIES

5.1.1. After the CM's and Architect's review**,** within one (1) week of receipt, Contractor is to distribute copies of the reviewed submittal to any supplier/fabricators, second or lower tier Contractors or other Contractors that must coordinate with this work. Contractor must maintain one copy at the Project Site for reference use.

5.1.2. Do not begin Work which requires submittals until return of submittals with CM's and Architect's stamp and initials indicating review with direction to proceed from either CM or Architect.

5.1.3. Contractor's responsibility for errors and omissions in submittals is not relieved by CM's or Architect's review of submittals.

5.1.4. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by CM's or Architect's review of submittals unless CM and Architect give written acceptance of specific deviations.

5.2. CM'S RESPONSIBILITIES

5.2.1. CM's review is for general administrative purposes only and neither this review, nor any subsequent approval by CM of a submittal, shall relieve Contractor from its obligations to comply fully with the Contract Documents.

5.2.2. CM will make changes or notations directly on the submittals, identify such review with its review stamp, sign and forward acceptable submittals to the Architect.

5.2.3. After the Architect's review, CM will forward submittals to the Contractor and retain one copy.

5.3. ARCHITECT'S RESPONSIBILITIES

5.3.1. Architect will review submittals within fourteen (14) Days after receipt, checking only for conformance with the design compliance of the Project and compliance with information given

in the Contract Documents. If the submission is large and/or requires detailed or lengthy review by the Architect, additional time may be required.

5.3.2. Architect will return to CM without review any submittals not bearing the Contractor's or CM's review stamp or not showing that it has been reviewed by the Contractor and CM.

5.3.3. Architect will make changes or notations directly on the submittal, identify such review with its review stamp, obtain and record Architect file copy and return the submittal to CM.

5.4. RE-SUBMISSION REQUIREMENTS

5.4.1. For Shop Drawings: Review returned CM and/or Architect drawings and re-submit as specified. All changes made must be identified through bubbling or other approved method.

5.4.2. For Product Data and Samples Resubmit new data and samples as required.

END OF SECTION 01330

SECTION 01360
COORDINATION (GENERAL)

1 COORDINATION OF WORK/COOPERATION

1.01 All Contractors are required to review, discuss and coordinate their Work with the Work of other contractors, Owner and CM with regard to sequence, timing, built-in Work and equipment, layout, location, compatibility of materials and sizes and required clearances prior to beginning the work to avoid construction delays which impact the Owner's occupancy of the facility.

1.02 Each Contractor

1.02.1 Coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.

1.02.2 Make provisions to accommodate items scheduled for later installation.

1.02.3 Provide to all other trades all information (drawings, diagrams, templates, embedments, etc.) necessary for the coordination of the Work.

1.02.4 Layout and install its Work at such time and in such manner as not to delay or interfere with the carrying forward of the Work of others.

1.02.5 Verification and Acceptance of previous work

1.02.5.1 As Work under each Agreement commences, the condition of preceding Work under other agreements shall be verified and accepted by each subsequent Contractor when appropriate.

1.02.5.2 Report in a prompt manner any interferences, discrepancies or incompatibilities discovered to CM, whose decision as to the Contractor at fault and as to the manner in which the matter may be resolved, shall be binding and conclusive on Contractors involved. CM may direct layout/ location changes as required to make the entire work fit together. Reasonable changes of this nature will not entitle any Contractor to an increase in contract price.

1.02.5.3 Verification may, at CM's discretion, include a joint review by the subsequent Contractor, previous contractor(s), and CM to note any corrective Work required, similar items affecting the Work and particularly items which prevent acceptance by the subsequent contractors.

1.02.5.4 The verification review procedures and findings shall be submitted in writing by subsequent Contractors to the CM.

1.02.5.5 Any corrective work necessary to satisfy requirements of the Contract Documents shall be performed promptly by the previous Contractor to prevent delay to the work under the subsequent Contracts.

1.02.5.6 After corrective work is accomplished the subsequent Contractor shall furnish written acceptance of the work as noted above.

1.02.5.7 CM’s participation in a joint review under this paragraph shall in no event be deemed to constitute approval of any layout or other Work that fails to comply with the **Contract Documents**.

1.02.6 Observation of the Work by others shall not relieve Contractor from its responsibility for coordination, supervision, or scheduling and direction of the Work.

1.02.7 Failure of a Contractor to notify others and CM of a potential interference, incompatibility, or discrepancy and any failure to coordinate Work with that of others prior to installation and/or fabrication shall be at the Contractor’s risk.

END OF SECTION 01360

SECTION 01370
COORDINATION DRAWINGS

1. GENERAL REQUIREMENTS

1.1. Contractor if required by its Work scope, shall be responsible for developing coordination drawings and participating in coordination meetings as defined herein, and shall have included the cost for such Work in its Bid Proposal.

1.2. Coordination Drawings shall be utilized to establish installation sequence, resolve trade coordination issues prior to installation and to make the most efficient use of space allocated for systems such as mechanical/electrical/plumbing installations without sacrifice to systems performance. This is also required to determine inter-relationships and possible interference's between all of the trades' Work and the architectural or structural features.

1.3. Contractors are required to attend coordination meetings as required by CM. The representative(s) from each Contractor is required to be familiar with the Work and have the expertise and authority to answer questions and make decisions and changes to its systems at these meetings.

1.4. The coordination drawings may also be used by Contractor as part of its required shop drawing and as-built drawing submittals.

1.5. Each Bidder should anticipate that each floor may require several meetings. However, in the interest of time, multiple floors or areas may be reviewed in one meeting. Development of coordination drawings will be by area and floor with order of priority established by CM.

2. COORDINATION DRAWING PROCESS

2.1. The Electrical Contractor, following an HVAC coordination kick-off meeting, shall immediately begin Work and prepare 1/4" scale layout drawings of all ductwork and piping. These drawings shall also show registers, grilles, diffusers, and similar features. Contractor shall include locations of all valves, dampers and shall note any items requiring access for service and maintenance as well as access doors in inaccessible ceilings. Drawings shall also show the size, layout and routing of all metal and flex ductwork, re-heat coils, terminal units, filters, and major hangers and supports. Contractor shall provide notation for diffuser boot sizes and heights and any other special features. Contractor shall provide cross sections and additional details through areas where clearances are tight and further detail as appropriate and/or required. Where piping or ductwork has external insulation, Contractor shall note or show locations and thickness. Contractor shall indicate bottom elevation of duct, pipes and equipment and elevation changes, to be measured to the lowest point including insulation and hangers where applicable.

2.2. In areas where no HVAC work occurs, but where other mechanical and electrical installations are installed, the Electrical Contractor will issue or note on transparencies indicating "No HVAC Work Required".

2.3. Within fifteen (15) working days of issuance, the Electrical Contractor shall have completed layout drawings and provide to CM. At this time, all Contractors shall attend a Coordination Kick-Off Meeting at which time the first distribution of HVAC prints is made and procedures and schedule are reviewed.

2.4. As layout drawings for HVAC Work for subsequent areas are completed, the Electrical Contractor shall provide prints of the completed layout drawings to CM. CM will in turn distribute prints to each required Contractor to include Plumbing, Fire Protection and Electrical Work. Respective Contractors shall then layout their own routings. Drawings shall include other major items such as valves, access panels, switch panels, pull boxes also noting items requiring access for service and maintenance, etc. as well as access doors in inaccessible ceilings.

2.5. Information for specific trades is required but not limited to the following:

2.5.1. Plumbing - Size, layout and routing of piping, valves, boxes, supports, etc., for <u>all</u> utilities regardless of material size. Show or note all pipe sizes and working clearances around valves, etc. For pitched piping, identify bottom elevations at key points and at least every column line. Note thickness and location of all external insulation. Bottom elevations shall be measured to the lowest point including hangers and insulation where applicable.

2.5.2. Sprinkler Piping - Size, layout and routing of mains and branch piping, hanger and supports, valves, working clearances, and bottom of pipe and bottom of hanger support elevations. Sprinkler head locations shall be shown on ceiling plans. For pitched piping, identify bottom elevation at key points and at least at every column line.

2.5.3. Electrical - Size, layout and routing and size of conduit and wire 2" or larger for normal and emergency power distribution systems, 1-1/2" or larger for communication systems telephone, nurse call, physiological monitoring, etc., include all systems specified, boxes larger than 4" x 4" x 4", hangers, supports, and electrical fixtures including lights, speakers, detectors, sensors, cable trays, raceways, etc. Size and clearance of ceiling and above ceiling mounted items shall be noted as a depth from finished ceiling to top of fixture or top of clear area required. Provide bottom elevations of conduits and equipment. Bottom elevation shall be measured from the lowest point, including hangers.

2.5.3.1. Within four (4) feet of all panels, or areas where more than 4 conduits, regardless of size, are routed or grouped together, identify an easement or right-of-way for the groups of conduit.

2.5.3.2. Also show all wall mounted items located within 12" of the ceiling plane.

3. EXECUTION

3.1. In the preparation of all coordination drawings, 1/2" scale details as well as cross and longitudinal sections are required to fully delineate all conditions. Particular attention shall be given to the locations, size and clearance dimensions of equipment items, shafts, corridors and similar features.

3.2. After completion of the final coordination drawings, minor changes in duct, pipe or conduit routings that do not affect the intended function may be made as required to avoid space conflicts, when mutually agreed to by all parties involved. However, items may not be re-sized or exposed items relocated without CM's written approval. No changes shall be made by Contractors in any wall or chase locations, ceiling heights, door swings or locations, windows or other openings, or other features affecting the function or aesthetic effect of the building. If conflicts or interference's cannot be satisfactorily resolved, Contractors shall notify CM who will, in turn, obtain a decision from the Architect.

3.3. Other Contractors responsible for supplementary composite drawings, as indicated herein, shall make similar distribution to that described in item 1.03 Paragraph E. All trades desiring additional prints of such drawings, beyond the basic distribution indicated above, shall arrange for and pay the cost of same.

3.4. Record copies of final drawings shall be retained by CM and each Contractor as working reference. All shop drawings, prior to their submittal to CM shall be compared with the final drawings and developed accordingly by the Contractor responsible. Any revision to the drawings which may become necessary during the progress of the Work shall be noted to and by all Contractors and shall be neatly and accurately recorded on the record copies. Each Contractor shall be responsible for the up-to-date maintenance of its own record copies of the final drawings, and any subsequent changes thereto shall be utilized by CM and each Contractor in the development of As-Built/Record drawings described in Section 01720 of the Project Manual.

3.5. The HVAC drawings need not be submitted as a whole, but they shall be submitted in all cases per CM's project master construction schedule and in ample time to avoid construction delays. The coordination drawings of all trades may lack complete data in certain instances pending receipt of shop drawings, but sufficient space shall be allotted for the affected items. When final information is received, such data shall be promptly inserted on the final drawings.

3.6. No extra compensation will be paid for relocating any duct, pipe, conduit, or other material that has been installed without proper coordination between all Contractors involved. If any improperly coordinated Work, or Work installed that is not in accordance with the approved coordination composites, necessitates additional Work by the other Contractors, the costs of all such additional Work shall be solely borne by the Contractor responsible.

3.7. All changes in the Scope of Work due to revisions formally issued and approved shall be shown on that trade's final drawings and thoroughly coordinated with the other trades.

3.8. All Work on the coordination composite drawings shall be performed by competent draftsmen and shall be clear and fully legible. CM shall be sole judge of the acceptability of the drawings. All drawings shall be drawn dimensionally and graphically correct.

3.9. In general and before the first meeting the following guidelines shall be followed:

3.9.1. All trades shall coordinate with the Electrical Contractor for the size, height and clearance requirements for recessed or semi recessed light fixtures, recessed speakers/detectors, and other electrical ceiling devices.

3.9.2. Sprinkler heads shall be centered in the center of lay-in ceiling tiles unless approved shop drawings note otherwise.

3.9.3. All elevations shall be based on height above finished floor using established benchmarks.

3.9.4. Standard suspended ceiling systems require 3" minimum clearance for materials and installation.

3.9.5. Review of other drawings may be necessary for special structural and suspended equipment requirements.

3.9.6. All trades to hang work as high as possible in above ceiling areas, allowing access to equipment for maintenance, repairs, connections, filters and removal without demolition of other Work.

3.10. Coordination drawings submitted during this process are not considered shop drawing submittals. The coordination drawings may be part of the required shop drawing submittal, but are made separate from the distribution specified in this section.

END OF SECTION 01370

SECTION 01400
QUALITY REQUIREMENTS

1. DOCUMENT CONTROL PROCEDURE

   1.1. Each Contractor is to provide CM its document control procedure to include drawing submittals and surveillance. In the absence of such a procedure, the Contractor will use the following procedure for document control.

   "A log is maintained identifying the drawing revision status, issue date and distribution (internal and external). The transmittal issuing the changed documents will indicate what changes are made and indicate that the documents are approved for use. Contractor meetings include a review of approved drawings. The review is documented in the meeting minutes. Superintendent surveillance activities include monitoring Contractor drawing use."

2. QUALITY CONTROL

   2.1. Each Contractor is responsible to provide the Owner with a completed quality product for its Work. Each Contractor shall be responsible for any costs associated with re-testing and re-performing the Work as a result of the Contractor's poor performance or workmanship or other failure to comply with the Contract Documents.

   2.2. All Work shall be done by persons qualified in their respective trades, and the workmanship shall be first-class in every respect. **Each Contractor is responsible for ensuring employees are appropriately trained.** All materials and equipment furnished shall be the best of their respective kinds for the intended use and unless otherwise specified, same shall be new and of the latest design.

   2.3. The Contractor shall provide CM, Owner and Architect access to the Work in preparation and progress wherever the Work is located at all reasonable times.

   Note: CM and the Architect will have the authority to reject Work that does not conform to the Contract Documents or may require special inspection or testing, whether or not such Work is to be then fabricated, installed or completed. The Architect shall make all decisions with respect to questions concerning the quality or fitness of materials, equipment and workmanship.

   2.4. Failure by a Contractor to conduct its operations, means and methods and coordinate proper sequencing of the Work may cause the Troy School District to withhold payment or any other means deemed necessary to correct non-conforming Work.

3. NOTIFICATIONS AND CORRECTIONS OF NON-CONFORMANCE

   3.1. CM and the Architect may conduct observations/evaluations of the Contractor's Work. CM and/or Architect's reviews do not relieve the Contractor from compliance with the Contract Documents or necessary corrections for deficiencies thereof. Contractors whose Work does not meet the standards set by the Contract Documents will be notified by representatives of the CM using a Corrective Action Report. The Contractor, upon receipt of the Corrective Action Report, shall complete and return the form and provide the corrective actions necessary in a timely manner as outlined.

   3.2. The **Corrective Action Report (CAR) (CON 18.2)** is in Section 01600 Forms.

4. CONTRACTOR PERFORMANCE EVALUATION

   4.1. CM will be evaluating Contractor's performance and will provide feedback during the life of the Project, on Contractor's performance, for the purpose of improving CM's Contractor selection process for future project endeavors.

   4.2. This Contractor Performance Evaluation form is generated by the CPS Database.

END OF SECTION 01400

SECTION 01450
TESTING AND INSPECTION SERVICES

1. CONTRACTOR'S RESPONSIBILITIES

1.1. The testing firm will report directly to the Troy School District. Copies of test and inspection reports will be furnished to the appropriate Contractors. The laboratory and its representatives will be instructed to promptly call to the attention of the Contractor any instance of non-compliance with the requirements of the Contract Documents. Failure to so notify the Contractor shall not relieve the Contractor of any of its responsibilities for compliance or making good workmanship or materials which are not in compliance with the requirements of the Contract Documents.

1.2. Each Contractor shall cooperate with the testing firm and provide labor to assist and lifts, ladders or other means to permit full access for testing firm and to assist with sample preparations where applicable.

1.3. The Contractor is responsible to pay the cost of additional testing in the event that additional testing of the Contractor's materials, installation, and other Work is required by the independent testing laboratory because of test results not in compliance with the Contract Documents and/or additional testing required as a result of Contractor's negligence or poor workmanship.

2. CONTRACTOR RESPONSIBILITIES

2.1. CONTRACTOR SHALL:

2.1.1. Notify CM sufficiently in advance of operations (24-hours minimum) to allow for laboratory assignment of personnel and scheduling of tests.

2.1.1.1. When tests or inspections cannot be performed after such notice, reimburse Troy School District for all expenses incurred arising out of or resulting from Contractor's negligence.

2.1.2. When the Contractor is providing the testing and prior to start of Work, submit testing laboratory name, address, and telephone number, and names of full time registered engineer and responsible officer. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards (NBS) during most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.

3. RE-TEST RESPONSIBILITY

3.1. Where the results of required inspections, tests, or similar services prove unsatisfactory and do not indicate compliance with the requirements of the Contract Documents, the re-tests shall be the responsibility of the Contractor regardless of whether the original test was the Contractor's responsibility.

3.2. Re-testing of Work revised or replaced by the Contractor is the Contractor's responsibility where required tests were performed on original Work. All costs and fees for re-testing shall be paid by the Contractor.

3.3. Schedule delays and costs which are the result of non-conforming work or remedy will be the responsibility of the offending Contractor.

END OF SECTION 01450

SECTION 01500
INTERIM LIFE SAFETY PLAN

1. PURPOSE AND POLICY

1.1. **PURPOSE:** To provide interim life safety measures during a construction Project. To protect Owner personnel, visitors, [patients] and property from fire and injury during remodeling or construction. This policy is used wholly or in conjunction with the safety program in the Project Manual.

1.2. **POLICY:** During a construction Project it shall be the responsibility of the Director of Facilities (or designee**)** and CM (through trade Contractors) to maintain compliance with the Life Safety Code NFPA Section 101. Compliance will be through the implementation of the following:

2. NOTIFICATIONS

2.1. Contractor shall communicate with and coordinate through CM for all changes to Life Safety measures including changes to: egress, the fire suppression system, the fire alarm system or any other Life Safety related changes to the construction site. Contractor is required to simultaneously notify the appropriate Owner personnel / departments: Owner's PM, Security, Facilities, Safety, Local and/or sate fire, 911 emergency services, etc.

2.2. Advanced notification using the appropriate form shall be submitted not less than twenty-four (24) hours in advance of the work. Forms can be obtained through CM.

SHUTDOWN REQUEST TYPE	FORM NAME [VERIFY WITH OWNER'S REQUIREMENTS]	SUBMIT FORM IN ADVANCE OF PROPOSED WORK BY:	SUBMIT FORM TO:
CHANGE IN EGRESS:	Submit egress plan of existing exiting and proposed change	3 Weeks	CM; CM to schedule a review meeting with the Owner and Architect for final approval
Change in Fire Suppression	Sprinkler Shut-Down Request	1 Week	CM for initial review 5 days prior; upon approval from CM simultaneously submit to CM, Safety, Security, OTHERS
Change in Fire Alarm	Fire Alarm Shut-Down Request	1 Week	CM for initial review 5 days prior; upon approval from CM simultaneously submit to CM, Safety, Security, Owner's Insurance Agency, State and/or Local Fire Department, ,VERIFY OTHERS
Mechanical Piping, HVAC or Electrical Shut-Down	Utility Shut-Down Request	1 Week	CM for initial review 5 days prior; upon approval from CM simultaneously submit to CM, Safety, Facilities, Security, OTHERS

3. INTERRUPTION OF EXIT - EGRESS CORRIDOR

3.1. Should construction of temporary structures for egress/exit be necessary:

3.1.1. Contractor will review with and obtain approval from CM any changes to the means of egress. This review and approval shall include the Owner and Architect to confirm appropriate travel distances to exits are maintained/established.

3.1.2. Contractor shall obtain approval from the appropriate agency for any planned temporary exiting structure prior to construction/implementation.

3.1.3. All Contractors shall be responsible for maintaining temporary egress/exits:

3.1.3.1. Each Contractor is responsible to protect, kept free of restrictions or obstructions, and maintain in full use all entrances to and exits from existing buildings and the construction site at all times. The safety and well-being of all persons must be of prime concern.

3.1.3.2. Contractor shall maintain and not disturb any temporary construction, including stairs, ramps, protected walkways, railings, lights and direction signage as required to maintain adequate exiting from the existing building.

3.2. Should an alternate egress route be necessary:

3.2.1. Contractor shall submit the appropriate forms to CM so all affected departments will be notified. Contractor shall not begin any work associated with a change in egress until the Owner has verified its internal departments are notified and prepared for the change.

3.2.2. Contractor shall install and maintain temporary exit signage and Contractor shall install and maintain temporary directional signage prior to starting Work associated with the change in egress..

4. INTERRUPTION OF THE SPRINKLER SYSTEM

4.1. Refer to the above matrix for advanced notification times and shut-down request distribution.

4.2. Priority will be given to localized interruption of these systems on first shift Monday through Friday when full staff is available when any shut down is necessary:

4.3. Contractor will provide an organized fire watch until the system is fully functional.

5. INTERRUPTION OF FIRE/SMOKE DETECTION AND ALARM SYSTEM

5.1. Refer to the above matrix for advanced notification times and shut-down request distribution.

5.2. Contractor shall maintain the operation of the total fire detection/alarm during the construction.

5.2.1. It is acceptable for the Contractor to place a thin plastic cover over the detector head during high dust producing activities with Contractor's prompt removal upon completion of the work.

5.2.2. At all other times the system will be returned to normal operating status.

5.3. Should the fire/smoke detectors and alarms systems be interrupted:

5.3.1. Contractor will provide an organized fire watch until the system is fully functional.

5.3.2. Temporary alarm pull stations will be established as a minimum should the interruption last more than twenty-four (24) hours.

6. CONSTRUCTION SITE MAINTENANCE

6.1. For interior construction. Contractor **shall:**

6.1.1. Refer to the above matrix for prior notifications.

6.1.2. Maintain existing Fire/Smoke Barriers and compartments.

6.1.3. Provide and maintain temporary partitions adjacent to functioning departments that are a UL rated 2-hour assembly and smoke/dust tight and non-combustible. Provide documentation of the UL rated assembly type to CM prior to constructing this Work.

6.1.4. Maintain temporary enclosures, fire-rated dust curtains, and all other necessary materials and equipment as required to prevent introduction of dust, dirt or debris into occupied portions of the building.

6.1.5. Coordinate locking of the construction area with CM and the Owner.

6.2. For exterior construction - Contractor shall:

6.2.1. Maintain site clearance for access to the external fire department connections.

7. REFERENCES

7.1. All current Life Safety codes

END OF SECTION 01500

SECTION 01520
TEMPORARY CONSTRUCTION

1 SUMMARY

1.01 This Section describes the following requirements including:

1.01.1 Project Signage

1.01.2 Snow Removal

1.01.3 Security

1.01.4 Temporary Field Office, Facilities and Parking

1.01.5 Temporary Fencing

1.01.6 Temporary Toilet Facilities

1.01.7 Drinking Water/Temporary Water

1.01.8 Roof Protection

1.01.9 Scaffolding

1.01.10 Water Control

1.01.11 Temporary Material Hoist/Elevator

1.01.12 Fire Precautions and Protection

1.01.13 Noxious Odors and Fumes

1.01.14 Temporary Stairs, Ladders, Ramps, Runways, and Barricades

1.01.15 Temporary Electrical Power and Light

1.01.16 Temporary Heating and Weather Protection

1.01.17 Temporary Enclosures

2 CONSTRUCTION FACILITIES

2.01 PROJECT SIGNAGE

2.01.1 The CM shall provide a project sign. No other signs or advertising shall be displayed on the premises without the approval of the Architect, Owner, and CM. This does not exclude the posting of required trade notice and cautionary signage by Contractors.

2.02 SNOW REMOVAL

2.02.1 Contractors performing Work under exposed conditions shall remove snow and ice for the protection and execution of their Work. Keeping public traffic areas and circulation routes free of snow shall be the responsibility of the CM/DESIGNATED CONTRACTOR.

2.03 SECURITY

2.03.1 The services of a security guard(s) will not be provided by CM.

2.03.2 Each Contractor, at its own cost and expense, may provide security guard, protective service or other means of site security as it deems necessary.

2.03.3 Contractors shall advise CM of any theft or damage which might delay the execution of the Work and furnish the Owner and CM with a copy of any theft report filed with local, county or state agencies.

2.03.4 Neither CM nor Owner assumes any responsibility for loss, theft or damage to the Contractor's materials or for damage to Work in place before the completion of the construction. In the instance of any such loss, theft or damage, the Contractor shall be responsible to renew, restore or

remedy the Work, tools, equipment and construction in accordance with requirements of the Contract Documents without additional cost to CM.

2.03.5 CM is not responsible for damage, liability, theft, casualty or other hazard to the automobiles or other vehicles, nor to injury, including death, to occupants of automobiles or other vehicles on the Owner's property.

2.03.6 CM may establish additional security policies and procedures. All Contractors will be required to cooperate with CM in implementing these procedures.

2.03.7 Site-parked equipment, operable machinery and hazardous parts of the new construction subject to mischief and accidental operation shall be inaccessible, locked or otherwise made inoperable when left unattended.

2.04 TEMPORARY FIELD OFFICE, FACILITIES AND PARKING

2.04.1 The Owner may designate an area for construction trailers. Placement and scheduled duration shall be coordinated by CM. Each Contractor is responsible to verify that all field offices, trailers and storage sheds shall be in accordance with the local Fire Marshal having jurisdiction. Each Contractor shall arrange and pay for its own telephone hookup and use. Each Contractor shall arrange and pay for its own temporary electrical hook-up, water and toilets. The Contractor shall pay for all power used for the Contractor's temporary field office and temporary electrical service. Construction personnel will be allowed to use the existing Owner parking facilities. Designated Contractors will be allowed to have on-site construction trailers. Construction trailers shall be limited to 10' x 30' or smaller.

2.04.2 Contractors shall maintain the use of designated space for offices and sheds. This includes removal of weeds, debris, trash and clean-up of the area after removal of such temporary structures.

2.04.3 Temporary field offices and sheds shall not be used for living quarters. .

2.04.4 Offices and sheds shall be of suitable design, maintenance and appearance, and meet the approval of CM and all applicable local codes and ordinances.

2.04.5 All temporary offices and sheds including foundations, must be removed within ten (10) days of written notice from CM including restoration of grade. Structures not removed in a timely manner will be removed by CM at Contractor's expense.

2.04.6 If a temporary office is built in the building, it must be fire treated in accordance with Section 01510, Fire Precautions and Protection.

2.05 TEMPORARY FENCING

2.05.1 The DESIGNATED CONTRACTOR shall provide temporary fencing with gates for required access and remove same at the completion of the Project.

2.05.2 The Contractors shall repair or replace fencing damaged as a result of its operation. Contractors shall remove and replace fencing and gates required to provide access for oversized items.

2.05.3 Contractor’s personnel are not allowed to work outside of the construction fence without permission of CM.

2.06 TEMPORARY TOILET FACILITIES

2.06.1 The CM shall provide and maintain temporary toilet facilities for the construction of the Project. The use of the Owner's existing permanent facilities is as described in Section 01140 Use of Premises.

2.06.2 During renovation activities, CM may obtain, through the Owner, permission to use designated toilet facilities within the contract boundaries for construction use. The use of the Owner’s existing permanent facilities outside the construction boundaries is strictly not allowed.

2.07 DRINKING WATER/TEMPORARY WATER

2.07.1 The Owner will pay for water used on this. Each Contractor shall be responsible to provide containers, paper cups, ice, hoses, etc. for its needs.

2.07.2 Immediately after award of the Agreement, the Mechanical Contractor shall furnish, install, maintain and subsequently remove a temporary hookup to the Owner's potable water system where directed by CM for construction purposes. The Contractor shall provide all temporary piping and approved backflow prevention as necessary for distribution from the source. Distribution of temporary water will be paid for by Contractors requiring same. A minimum of two (2) hose bibs shall be provided by the Mechanical Contractor as directed by CM.

2.08 ROOF PROTECTION

2.08.1 Contractors and their Subordinate Parties, shall be responsible for damages to roofing, sheet metal and roof structure while performing Work. The Roofing Contractor will perform the repair Work at the expense of the Contractor responsible for the damage.

2.08.2 All Contractors will protect adjacent existing roof surfaces while performing their Work. No construction materials will be allowed to be placed on existing roof surfaces without prior approval of the Owner through CM.

2.09 SCAFFOLDING

2.09.1 Each Contractor is responsible for providing and maintaining any and all ladders, scaffolds, and other staging as required to complete all work. All such ladders, scaffolds and staging equipment shall be erected, maintained and subsequently removed by each Contractor in accordance with all applicable safety laws, rules and regulations.

2.10 WATER CONTROL

2.10.1 All pumping, bailing or well point equipment necessary to keep excavations and trenches free from the accumulation of water during the entire excavating and backfilling progress of the Work shall be the responsibility of the Contractor performing said excavations and trenches due to its scope of Work.

2.10.2 Each Contractor shall be responsible for keeping the building at grade and below free from water from the time the building backfill is completed until the building is watertight.

2.10.3 Dispose of water in such a manner as will not endanger public health or cause damage or expense to public or private property. Abide by the requirements of any public agencies having jurisdiction.

2.11 TEMPORARY MATERIAL HOIST/ELEVATOR

Each Contractor is responsible for its own hoisting and material/ equipment movement costs as required to complete the Work under its Agreement.

2.11.1 CM may operate and maintain a permanent elevator until such time as all material hoisting requirements have been met. Elevator requirements in excess of the capacity or size of this elevator shall be provided by each Contractor at its expense. This elevator shall not be used for the placement of concrete, the transporting of workers, or other means inconsistent with its use as directed by CM. The operating cost for all overtime use of the elevator shall be paid by the Contractor requiring such services.

2.11.2 The Elevator Contractor shall be obligated to extend warranty and guarantee periods on any permanent equipment used prior to Substantial Completion.

2.11.3 Transportation of construction materials through the Owner's facility shall be accomplished in accordance with the requirements described in Section 01140 Use of Premises in such a manner so as to:

2.11.3.1 Not damage any of the existing facility.

2.11.3.2 Not impair the Owner's use of the facility.

2.11.3.3 Not create any type of mess or additional cleaning requirements in Owner occupied areas.

2.11.4 The Owner's lifting equipment is not available for the unloading, conveying or installation of Contractor's materials.

3 FIRE PRECAUTIONS AND PROTECTION

3.01 All Contractors and their Subordinate Parties shall

3.01.1 Assume full responsibility and take all necessary precautions to guard against and eliminate all possible fire hazards and to prevent damage to any construction work, building materials, equipment, temporary field offices, storage sheds, and all other property, both public and private.

3.01.2 Conspicuously post the location of the nearest fire alarm pull box and the telephone number of the local fire department within the field offices and on the construction site adjacent to its Work

3.01.3 Take precautions to prevent fire hazards in accordance with all fire protection and prevention laws and codes. No open fires shall be permitted.

3.01.4 Shall not be permitted to perform welding, flame cutting, or other operations involving the use of flame, arcs, or sparking devices without submitting a Hot Work Permit to CM a minimum of 24 hours prior or without adequate protection and shielding. Hot Work Permits can be obtained through CM. All combustible and flammable material shall be removed from the immediate area of the hot work. Material shall be protected with a fire resistant tarpaulin to prevent sparks, flames, or hot metal from reaching materials.

3.01.4.1 Only fire resistant tarpaulins shall be used on this Project.

3.01.5 Provide the necessary personnel and firefighting equipment to effectively control incipient fires resulting from the hot work.

3.01.6 Provide its own fire extinguishers in the immediate area of the Work.

3.01.7 Review the entire Project at least once a week to make certain it has adhered to the conditions and requirements set forth herein.

3.01.8 Shall not bring into building at any one time more than a one day supply of flammable liquids such as oil, gasoline, paint or paint solvent

3.01.8.1 All flammable liquids having a flash point of 110 degrees F or below, which must be brought into any building, shall be confined to Underwriter's Laboratories' labeled safety cans.

3.01.8.2 The bulk supply of all flammable liquids shall be detached at least 75 feet from the building and from yard storage of building materials.

3.01.8.3 Spigots on drums containing flammable liquids are prohibited on the project site. Drums are to be equipped with approved vent pumps.

3.01.9 Not store or leave overnight within the confines of the permanent building any combustible materials.

3.01.9.1 This includes all internal combustion engines using gas or fuel oil.

3.01.9.2 Hoisting of flammable or combustible materials to the roof shall only be in quantities as needed for immediate use

3.01.10 Agree that, in the event of fire, all its workers anywhere on site will assist in extinguishing the fire

3.01.11 Coordinate with the Owner and CM the permanent fire protection water supply, fire extinguishing equipment, shut down and tie-ins between new and existing fire protection systems shall be installed at the earliest possible date.

3.01.11.1 As each sprinkler system is completed and placed in service, the control valve shall be sealed. Permission to break seals and close sprinkler valves shall be given only by CM with approval of the Owner.

3.01.12 Not place shanties of combustible construction inside of any structure.

3.01.12.1 Such shanties shall be detached at least seventy-five (75) feet from the building or as directed by CM with approval of the Owner.

3.01.12.2 Totally incombustible shanties may be, if approved in writing by CM, located inside of the structure

3.01.12.3 Use of only Underwriter's Laboratory approved heaters and/or stoves is permitted in field offices or storage sheds and they shall have fire resistive material underneath and at the sides near partitions and walls. Pipe sleeves and covering shall be used where stove pipe runs through walls or roof

3.02 FIRE EXTINGUISHERS

3.02.1 Fire extinguishers shall be "all purpose", and not a water type, to meet the approval of the Fire Underwriter's Laboratory, and will be inspected at regular intervals and recharged if necessary.

3.02.2 In areas of flammable liquids, asphalt or electrical hazards, extinguishers of the 15 lb. carbon dioxide type or 20 lb. dry chemical type shall be provided

3.02.3 **CM** will provide and maintain in working order at all times during construction not less than a fire extinguisher for each 3000 sq. feet with travel distance not to exceed 100 feet.

3.02.4 All other required extinguishers shall be provided by the Contractor creating such hazard

3.03 NOXIOUS ODORS AND FUMES

3.03.1 Combustion engine equipment, tar kettles and any other items causing noxious odors or fumes, including diesel powered equipment, will NOT be allowed in the building or near air intake louvers or building entrances and exits. If intake louver locations are in doubt, consult with CM.

4 TEMPORARY STAIRS, LADDERS, RAMPS, RUNWAYS, AND BARRICADES

4.01 Each Contractor is to provide and maintain all necessary temporary stairs, ladders, ramps, and runways to facilitate conveyance of workers, materials, tools, and equipment for proper execution of its Work. All protection and safety barricades, devices, covers, and all other necessary items shall be provided by each Contractor as it relates to the safe conduct of its Work and protection of people and property in its Work area in accordance with applicable law.

4.02 Any Contractor or Subordinate Party performing excavation Work shall be responsible to furnish, install and maintain temporary barricades and/or fencing of all open excavations until such time as the backfilling is complete. Flasher lights shall be provided on barricades and fencing by the Contractor as requested by CM and in accordance with applicable law. As a minimum, all barricades across roads and walks shall have lights on them in working condition.

4.03 Prior to the removal of all shoring and forms, the DESIGNATED CONTRACTOR shall be responsible for temporary protection at the building floor perimeters and openings. Immediately after the removal of all shoring and forms, the DESIGNATED CONTRACTOR shall furnish, install, and maintain all necessary temporary protections at the building floor perimeters and openings. Protection shall be OSHA 29 CFR Part 1926.502 (B) “Guardrail Systems” and shall include but not be limited to two line rails and toe boards. Each Contractor that disturbs any temporary protection for its Work is responsible to reinstall to its original condition the guardrail or barricade system for the protection of the workers and others until final construction of perimeter exterior wall and/or shaft openings is completed. All other protection and safety barricades, devices, covers, etc., including those at all roof areas, shall be provided by the DESIGNATED CONTRACTOR] Contractor as it relates to the safe conduct of its Work in accordance with all local, state and federal law, rules and regulations and the requirements of the Contract Documents and shall be in accordance with the most stringent requirements.

4.04 The DESIGNATED CONTRACTOR shall provide temporary guardrails at the building floor perimeters, interior shafts, all roof areas, or other openings, immediately after the erection of the steel or precast frame and with the installation of metal or decking. Protection shall be OSHA 29 CFR Part 1926.502 (B) "Guardrail Systems" and shall include but not be limited to two line rails and toe boards. This temporary protector shall be left in place after completion of the steel or precast frame for the use of all other Contractors. The DESIGNATED CONTRACTOR shall maintain and remove said guardrails and patch concrete. Each Contractor that disturbs any temporary protection for its Work is responsible to protect the area during its Work and to reinstall to its original condition the guardrail or barricade system for the protection of the workers and others until final construction of perimeter exterior wall and/or shaft openings is completed. All other protection and safety barricades, devices, covers, etc. shall be provided by this Contractor as it relates to the safe conduct of its Work in accordance with all local, state and federal regulations and the requirements of the Contract Documents, and shall be in accordance with the most stringent requirements.

4.4. Each Contractor and its Subordinate Parties shall provide and maintain in good repair barricades, overhead protection, guard rails, etc., as required by law or necessary for the protection of the public and personnel engaged in the Work from hazards incidental to performance of the Work. Contractor shall do everything necessary to protect the Owner's employees, the public and workers from injuries and to protect vehicles and other property from damage.

5. TEMPORARY ELECTRICAL POWER AND LIGHT

5.1. Electrical Energy Costs

5.1.1. The Owner will pay for electrical energy to operate temporary electrical power and lighting for the duration of the project at designated locations. Temporary power will be provided free of charge.

5.2. Power Source

5.2.1. The Electrical Contractor shall provide, install, and pay for labor, equipment and materials required to make connections to the Owner's power source and to provide temporary electrical power and light distribution. The Electrical Contractor shall coordinate the location of the electrical power and lighting as directed by CM.

5.2.2. The Electrical Contractor will provide for the CM's construction trailer a 120/208 volt (or 120/240 volt), 100 ampere single phase power source. The cost of hook up and removal of temporary electrical service to other contractor's trailer shall be each Contractor's responsibility.

5.2.3. Protection shall be provided for the power supply source complete with disconnect switch and other required electrical devices.

5.3. Rules and Regulations:

5.3.1. All temporary equipment and wiring for power, lighting and distribution requirements shall conform to OSHA/NFPA requirements and be in accordance with applicable provisions of governing laws, codes, and ordinances.

5.3.2. All temporary wiring and distribution equipment shall be maintained so as not to constitute a hazard to persons or property.

5.4. Temporary Power Distribution:

5.4.1. The Electrical Contractor will provide and maintain temporary power distribution as follows:

Construction power shall be 120/208 volts, 3 phase, 4 wire plus ground. Provide the following outlets together with feeders, grounding, protective devices and ground fault interrupting devices.

5.4.1.1. Power centers - on each floor of the new building, provide a minimum of two (2) power centers or not less than one (1) per 10,000 s.f. rated not less that 100 amperes at 120/208 volt, 3 phase. 4 wire plus ground. Within the remodeled areas, provide at least one (1) additional similarly rated power center. Locate the power centers such that each will serve approximately equal areas and as far as possible, each be in the center of the respective area served.

5.4.1.2. 120 volt duplex outlets - Provide weatherproof, G.F.I. protected, 20 ampere grounded outlets at a minimum rate equal to 1 - duplex outlet per 400 square feet. Outlets may be grouped in clusters of up to six duplex types with corresponding pro-rated increase in area served, provided that every portion of the construction and remodeled premises can be reached from the nearest outlet using a flexible cord no more that 50 feet in length.

5.4.2. As partitions are erected, locations of power distribution points shall be added or relocated.

5.4.3. Ground Fault Circuit Interrupter (GFCI) protection will be provided on all temporary power receptacles and, where possible, directly on the circuit breaker supplying temporary power as referenced in NEC 305-6(a).

5.4.4. The assured equipment grounding conductor program is only to be used on circuits greater than 20 amps as referenced in NEC 305-6(b).

5.5. Temporary Electrical Light Distribution:

5.5.1. The Electrical Contractor shall provide and maintain temporary electrical light distribution as follows:

5.5.1.1. Lighting shall be achieved using 120 volt guarded incandescent fixtures, or other suitable fixture types, to Federal or State OSHA required minimum levels of illumination.

5.5.1.2. 120 volt temporary lighting as required in interior work areas. In addition to these minimum requirements provide adequate security lighting at guarded entrances outside storage areas, parking areas, and in areas of Contractor's and Architect's field offices and sheds.

5.5.2. As partitions are erected or other interferences which hamper achieving the minimum levels of illumination, locations of lighting distribution points shall be added or relocated.

5.5.3. Task lighting in addition to OSHA required lighting shall be provided by each Contractor.

5.6. Temporary Power and Light for Special Conditions:

5.6.1. Special conditions for temporary electrical power and lighting required by others shall be provided as follows:

5.6.1.1. Each Contractor requiring service of capacity or characteristics other than specified must make arrangements with the Electrical Contractor and pay for their own installation, removal, and service.

5.6.1.2. Where 3 phase power is required, the Contractor must pick up service at the distribution panel located outside the building addition.

5.6.1.3. The necessary grounded portable cords, lamps, light-stands, and fuses from the distribution outlets to points of use shall be provided by each Contractor to suit its own requirements.

5.6.1.4. Temporary power cannot be used for welding operations.

5.7. Servicing of Temporary Power and Lighting:

5.7.1. The Electrical Contractor shall be responsible for the following:

5.7.1.1. Servicing, repairing and rearrangement of service equipment, temporary power, temporary lighting, and re-lamping.

5.7.1.2. Removal and disposal of temporary electrical power and lighting at completion of the Project or when so directed by CM and repair of damage caused by installation or removal.

5.8. Permanent Electrical Power and Lighting:

5.8.1. When permanent electrical power and lighting systems are in operating condition, they may be used for temporary power and lighting for construction purposes provided the Electrical Contractor:

5.8.1.1. Obtains the approval of the Architect and/or Owner through CM.

5.8.1.2. Assumes full responsibility for operation of the entire power and lighting systems.

5.8.1.3. Verifies that warranty dates are established prior to usage of equipment and lamps.

5.8.1.4. Pays costs for operation, maintenance, and restoration of the systems.

5.8.2. As permanent power and lighting becomes available, these systems will generally supplant the appropriate portions of the temporary installation.

6. TEMPORARY HEATING AND WEATHER PROTECTION

6.1. Temporary heating requirements during the course of construction shall be divided into two categories as follows:

6.1.1. Cold weather protection.

6.1.2. Temporary heating.

6.2. Cold Weather Protection:

6.2.1. Heating required during the construction period prior to enclosure of the building shall be classified as "cold weather protection."

6.2.2. Each Contractor shall provide temporary heating and protection, necessary to allow its Work to continue during cold weather to meet the project milestone dates prior to building enclosure, including:

6.2.2.1. The heating of materials (such as water and aggregate) as well as space heating for protection of newly placed or built construction at required temperatures (but not lower than 50 degrees F) and for the time specified.

6.2.2.2. Fire retardant tarpaulins and other materials used for temporary enclosures.

6.2.3. Each Contractor shall provide plan to allow Work to continue without regard to temperature.

6.2.4. Heat shall be provided by smokeless UL approved portable unit heaters, using fuel of types and kinds approved by Underwriter's Laboratories, Factory Mutual, and the Fire Marshal.

6.2.4.1. The Contractor shall provide fuel, power, maintenance, and attendance required for operation of portable heaters.

6.2.4.2. Interior or exterior surfaces damaged by the use of portable heating units shall be replaced with new materials at the responsible Contractor's expense.

6.2.5. It shall be the responsibility of each Contractor to protect its own Work.

6.3. Temporary Heating:

6.3.1. Daily construction heat required after the building is enclosed shall be classified as "temporary heating" and will be the responsibility of the Mechanical Contractor to install and maintain.

6.3.2. The building or buildings or any portions thereof shall be considered enclosed when in the opinion of CM:

6.3.2.1. The exterior wall system and temporary interior wall enclosures are in place.

6.3.2.2. Openings in exterior walls are covered to provide reasonable heat retention.

6.3.2.3. The building is ready for interior drywall, masonry and plastering operations.

6.3.2.4. The permanent roof is substantially installed.

The CM shall provide and maintain the temporary interior wall enclosures. If the exterior wall system is not complete in time to provide building enclosure of a portion of the new structure as scheduled, the CM shall provide and maintain temporary exterior wall enclosures of polyethylene and, in addition to exercising all other rights and remedies under the Contract Documents and law, CM shall be entitled to deduct the cost of such enclosures from the moneys due or to become due the Contractor(s) responsible for failure to meet said schedule.

6.3.3. In areas of the building or buildings where Work is being conducted, the temperature shall be maintained as specified in the various sections of the specifications, but not less than 50 degrees F for interior rough-in and not less than 60 degrees F during finishes installation. The temperature shall not be allowed to reach a level that will cause damage to any portion of the Work, including materials stored in the building, which may be subject to damage by low temperatures.

6.3.4. Until the permanent heating system, or suitable portion thereof, is in operating condition, provide sufficient and UL approved space heaters of suitable capacity to maintain required temperatures in areas where work is being conducted and materials are stored. Include all necessary maintenance, venting and attendance for this temporary heating to meet all applicable laws, rules and regulations.

6.3.5. When the permanent heating system, or a suitable portion thereof, is in operating condition, the system may be used for temporary heating, provided the Electrical Contractor:

6.3.5.1. Obtains approval from CM in writing for its use and any special provisions required for its temporary operation.

6.3.5.2. Assumes full responsibility for the entire heating system until final acceptance of the system by the Owner.

6.3.5.3. Uses supply only, not return if temporary heating utilizes the building's ductwork system.

6.3.5.4. Pays all costs for maintenance, attendance and restoration to "like new" condition of the system including final cleaning of equipment and ductwork and all necessary touch-up painting.

6.3.5.5. Turns over satisfactory evidence to CM showing the extended warranties from manufacturers and proper maintenance procedures.

6.3.5.6. Provides and maintains temporary filters, boxes and other parts used for the temporary condition and replaces same with the new permanent filters at time of occupancy consistent with the warranty provisions. The Electrical Contractor shall pay the cost of extending warranty and guarantee periods on any permanent equipment used prior to substantial completion.

6.3.6. Electrical power required for temporary heating will be furnished free of charge. The installation and service of the necessary temporary electrical feeders will also be the responsibility of the Electrical Contractor.

6.4. TEMPORARY ENCLOSURES

6.4.1. The Carpentry Contractor (or as specified in the Work Scopes) shall provide temporary (insulated) weather-tight closures of openings in exterior surfaces to provide acceptable working conditions and protection for materials, to allow for temporary heating, and to prevent entry of unauthorized persons. Provide doors with self-closing hardware and locks.

6.4.2. The Roofing Contractor (or as specified in the Work Scopes) shall provide temporary roofing as required to provide and maintain a watertight enclosure during construction.

6.4.3. The Drywall Contractor (or as specified in the Work Scopes) shall provide temporary partitions and ceilings as required to separate Work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas and to prevent damage to Owner’s facilities and equipment.

END OF SECTION 01520

SECTION 01530
FIELD ENGINEERING AND LAYOUT

1 LAYOUT OF THE WORK; Each Contractor shall

1.1. be responsible for the layout and engineering of its own Work from the established points and lines given by a registered surveyor employed by CM and to coordinate with all other trades.

1.2. be responsible for detailed and accurate layout of its own and its Subordinate Parties' Work to dimension from the principal lines.

1.3. make provisions to preserve all control points, such as monuments, stakes, bench marks or other datum points and shall replace at its own cost any of these which might be lost or displaced through its neglect.

1.4. examine the conditions under which the Work is to be installed, shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents before commencing activities. Any errors, inconsistencies, omissions, discrepancies or conditions detrimental to proper performance of the Work that are discovered shall be reported to CM at once. Contractors are not to proceed until the required corrections are accomplished.

2. Verification and Documentation

2.1. The exactness of grades, elevations, dimensions, or locations given on any Drawings issued by Architect or the work installed by other contractors, is not guaranteed by Owner or CM.

2.2. In all cases of interconnection of its Work with existing or other Work, it shall verify all dimensions relating to such existing or other Work. Any errors due to the Contractor's failure to verify all such grades, elevations, dimensions, or locations shall be promptly rectified by the Contractor without any additional cost to the Owner or CM..

2.3. As the Work progresses, the Contractor shall prepare lay out drawings showing the exact locations of Work under its Contract as a guide to all trades. Prior to any installation, the separate Contractors shall exchange layout drawings and coordinate the Work and be subject to verification by all subsequent Contractors.

2.4. Each Contractor shall be responsible to take such field measurements as may be required to determine the size of ordered material. In the event "guaranteed dimensions" are required, the Contractor shall promptly advise other Contractors through CM by use of drawings, templates or mock-ups of the required conditions.

2.5. All Work, and in particular, piping, ducts, conduit and similar items, shall be neatly and carefully laid out to provide the most useful space utilization and the most orderly appearance. Except as otherwise indicated or directed, piping and similar Work shall be installed as close to above ceiling floor slabs and walls as conditions reasonably permit, located to prevent interference with other Work or with the use of the spaces. Before Contractor installs a valve in an exposed location, it must make all efforts to install it in an accessible, concealed location. Contractors shall carefully plan the layout and review any questionable installations with CM.

2.6. The Owner or CM may utilize a registered land surveyor to verify alignment and layout of certain portions of the Work. If that Work is out of tolerance or incorrect, the installing Contractor will be responsible for prompt correction of the Work to comply with the Contract Documents, along with all expenses incurred by Owner or CM in such verification process, including, but not limited to, the cost for the surveying services, as well as the additional time expended by CM personnel at standard billing rates.

END OF SECTION 01530

SECTION 01540
CUTTING AND PATCHING

1 INSPECTION

1.01 Before cutting, examine surfaces to be cut, including elements subject to damage or movement during cutting and patching work. Report any unsatisfactory or questionable conditions to CM in writing.

1.02 Before proceeding, meet at the site with CM and the parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference, conflict and possible effects on the Owner's existing operations. Coordinate procedures, temporary support, methods of dust and water protection, etc. and resolve potential conflicts before proceeding.

1.03 When working in and around existing buildings, if any hazardous material is encountered or is suspected to be present, immediately notify CM and stop work in this area as described in Section 00840 Hazardous Materials until further direction is given by CM or the Owner.

2 PREPARATION

2.01 Provide adequate temporary support to assure the structural value and integrity of the affected portion of the work. Where specified or required, submit temporary support methodologies for approval.

2.02 Provide devices and methods to protect adjacent areas or other portions of the Project from damage including dust protection, water protection, and exposure.

2.03 Maintain excavations free of water.

3 EXECUTION

3.01 The use of gasoline powered equipment, jackhammers or power actuated tools, explosives is prohibited on this Project.

3.02 Each Contractor shall:

3.02.1 On behalf of itself and its Subordinate Parties be responsible for the cutting of all holes and openings through existing walls, partitions, ceilings, floors and roofs as necessary for the installation of its Work. Holes and openings shall be neatly cut and of minimum size to allow the Work to be installed. Execute cutting and demolition by methods which will prevent damage to other Work, and will provide proper surfaces to receive installation of repairs.

3.02.2 Execute work in such a manner as to minimize disruptions to or interference with the Owner's normal operations or functioning in the existing buildings and provide all means necessary to provide safety and convenience of those employed in and about the premises.

3.02.3 Be responsible for patching of all holes and openings it makes. Fit work should be airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces. Patching is to match adjacent surfaces in materials and finish.

3.02.4 Utilize only tradesmen skilled in the specific finish and material involved in making the patches. All patching is to be done in a neat and workmanlike manner to the satisfaction of CM. Defective Work shall be corrected at no cost to the Owner and CM.

3.02.5 Do all necessary cutting and fitting required to make a satisfactory connection where new Work connects with existing so as to leave the entire Work in finished and workmanlike condition. Furnish all labor and materials to this end, whether or not shown or specified. All measurements must be verified at the site.

3.02.6 Employ the original installer and fabricator, when possible, to perform cutting and patching for, weather-exposed or moisture-resistant elements, sight-exposed finished surfaces.

3.02.7 Execute fitting and adjustment or products to provide a finished installation to comply with the specified products, functions, tolerances and finishes.

3.02.8 Restore Work which has been cut or removed and shall install new products to provide completed Work in accordance with the Contract Documents. Each Contractor will be responsible to pay the appropriate contractor as designated by CM for restoring any portion of the Project that is disturbed, including but not limited to, slabs, walls, ceilings, fire rated partitions, spray-on fireproofing, and finishes, to their original state as a result of Contractor's action.

3.02.9 Refinish entire surfaces as the Contractor's Work scope requires providing an even finish to match adjacent surfaces and finishes, for continuous surfaces, refinishing to nearest intersection, for an assembly, and refinish the entire unit.

3.02.10 Be held responsible for reckless cutting of holes in slabs, walls or other finishes, or for scraping off areas of fireproofing larger or greater than that which is necessary for installation of its Work.

3.03 Removal and replacement of ceilings not scheduled to be replaced shall be the responsibility of the Contractor requiring access.

END OF SECTION 01540

SECTION 01550
CLEAN-UP AND FINAL CLEANING

A. SUMMARY

Execute final cleaning at completion of the Work, as required by this Section. For Contractor's daily clean-up, dust control and rubbish removal operations during construction, refer to Section 01520 Temporary Construction Controls.

a. DISPOSAL REQUIREMENTS

i. Conduct final cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on Project site.

2. Do not dispose of volatile wastes such as mineral spirits, oil or paint thinner in storm or sanitary drains.

2 PART 2 - SITE CLEAN-UP/RUBBISH REMOVAL PROCEDURE

2.1. REQUIREMENTS

2.1.1. General Contractor shall:

2.1.1.1. Be responsible for daily, weekly and final clean-up of its Work and the work of its Subordinate Parties as defined herein.

2.1.1.2. Comply with applicable labor agreements and jurisdictional rules in the hiring of laborers to perform its clean up obligations under the Contract Documents.

2.1.1.3. Control of dust generated by its operations on a daily basis.

2.1.1.4. Maintain roadways clear of all debris at all times.

2.1.1.5. Only use cleaning materials which will not create hazards to health or property and which will not damage surfaces. Only those cleaning materials and methods recommended by the manufacturer of the surface material to be cleaned shall be used.

2.1.1.6. Only use sweeping compounds that do not leave residue on concrete floor surfaces and that will not affect installation of finish flooring materials

2.1.2. Dumpsters:

2.1.2.1. Unless stated otherwise in the Work Scopes, the CM will provide and maintain the job site dumpsters for unidentifiable debris for use as specified below.

2.1.2.2. Each Contractor and its Subordinate Parties shall be responsible for daily clean-up, removal and placement in dumpsters of all debris and waste resulting from its operations.

2.1.2.3. No overfilling of dumpsters will be allowed. All adjacent areas are to be kept clean. Excavation, demolition, masonry, drywall and hazardous waste materials are NOT to be placed in CM's dumpster.

2.1.2.4. Each Contractor will be responsible for removing its own excavation, demolition, masonry, drywall and Hazardous Materials from the site in strict accordance with applicable laws and regulations regarding disposal.

2.1.2.5. Contractor shall indemnify, defend and hold harmless the Owner and CM from claims, damages, suits, costs, or expenses of any kind (including attorney's fees and costs) arising out of, resulting from or in connection with Contractor's misuse of dumpsters.

2.1.3. Daily Clean Up, Each Contractor shall:

2.1.3.1. Be responsible, DAILY for the clean -up, transport and removal from the site of identifiable debris including but not limited to, bulky debris, packaging, containers, unused materials and equipment, (i.e., masonry and concrete materials, drywall, steel, crates, carton, demolition debris, other packaging, and combustible items).

2.1.3.2. Leave no piles of debris in the building overnight. The cost of any overtime premium required to remove debris immediately at the end of each workday shall be included in the Contractor's Work.

2.1.3.3. handle materials in a controlled manner so that dust and other contaminants, do not affect the Owner's or other Contractor operations and equipment

2.1.3.4. Be responsible to leave its Work and work area in a clean condition. This includes, but is not limited to, removal of all grease, dust, dirt, stains, labels, fingerprints and other foreign matter.

2.1.4. Weekly Clean Up: Each Contractor shall:

2.1.4.1. While on site, provide to CM one (1) person for each five tradesmen (or portion thereof) employed at the site, one day per week, for up to four (4) hours, for the exclusive purpose of performing overall project weekly clean-up of unidentifiable debris. The cost of this (these) person(s) shall be included in Contractor's Work.

2.1.4.2. Include sweeping, loading and disposal of miscellaneous debris such as mud tracked through the building, drinking cups, bottles, lunch wrappers and other unidentifiable debris. Trash and debris from this operation shall be placed in the dumpster(s)

2.1.5. Final Clean Up:

2.1.5.1. Final clean-up, will be done at a time designated by CM.

2.1.5.2. Normally, Final Clean Up will occur before punchlist inspection or prior Owner Occupancy turnover.

2.1.5.3. The Contractor's duties for Final Cleaning are:

2.1.5.3.1. Prior to final completion or Owner occupancy, whichever occurs first, conduct an inspection of sight-exposed interior and exterior surfaces, and all Work areas, to verify that the entire Work is left in a broom clean condition and that all Final Cleaning as set forth above has been performed.

2.1.5.3.2. Tunnels and closed off spaces shall be cleaned of packing boxes, wood frame members and other waste materials used in the construction.

2.1.5.3.3. Temporary labels, stickers and similar items shall be removed from fixtures and equipment. Unless otherwise directed in the technical specifications, Contractors shall not remove permanent name plates, equipment model numbers, ratings, or other items intended to be permanently affixed to the fixture or equipment.

2.1.6. Use of Owner's Facilities: The Owner's facilities are not to be used by Contractor for the disposal of trash or debris from its Work.

2.1.7. Failure to perform Clean Up:

2.1.7.1. If any Contractor or its Subordinate Parties fails to maintain a satisfactory clean-up program, CM will issue written notice, to the responsible Contractor, that the necessary clean-up must be performed within twenty-four (24) hours after the notice is given. The establishment of a definite deadline for the removal of debris and rubbish will supersede the necessity for any formal notification that such work must be done.

2.1.7.2. If Contractor(s) fail to perform the clean-up, by the deadline, CM may perform clean-up on the Project and back charge the responsible Contractor(s) for the costs. If necessary in order to remove unidentifiable debris beyond what is removed during weekly clean up, CM will perform such clean-up and shall pro-rate the cost among the Contractors in its discretion, based on Contractor(s) type of work and manpower on site. Back charges may be deducted from the monthly invoices of the Contractor(s) and/or final payment.

2.1.8. Hazardous Materials: Contractors or Subordinate Parties shall dispose of Hazardous Materials in strict accordance with applicable federal, state, and local laws and regulations. Hazardous Materials may not be placed in dumpsters and/or containers not so designated for such placement.

END OF SECTION 01550

SECTION 01600
FORMS

1 USE OF FORMS

1.01 Upon award of the Agreement, the various forms described and referenced in the Project Manual will be provided by CM and therefore are not bound in the Project Manual. Copies of forms are available for inspection at CM Office.

1.02 Following is a list of the key forms:

01250 Changes in the Work

- PCO- Notice to Proceed
- PCO- Quotation Only
- Change Order Form (CMS.9.1 or CMS.9.2)

01290 Payment Procedures

- Application and Certificate for Payment (CON.27.1) and Continuation Sheet (CON.27.2)
- Consent of Surety to Reduction In or Partial Release of Retainage (CON.26.6)
- Payment schedule (PSI.10.1)
- Payment Request for Stored Materials Form (CON.26.5)
- Acknowledgment of Payment and Partial Unconditional Release Form (CON.26.3)
- Unconditional Final Release and Waiver Subcontractor/Materialman Form (CON.26.4)
- Sworn Statement Form (CON.26.2)

01320 Communications

- Trade Contractors Daily/Pre-Task Plan (CON.14.4)
- Request for Information Form (CON.25.2) (in company approved software, if necessary)

01330 Submittals

- BMC Submittal Transmittal Form (CON.9.6)

01400 Quality Requirements

- Corrective Action Report (CAR)/Notice of Non-Conformance (NCR) (CON.18.2)

01700 Contract Close-out

- Consent of Surety Company to Final Payment Form (CON.26. 7)
- Consent of Surety to Reduction in or Partial Release of Retainage Form (CON.26.6)
- Certificate of Contract Completion Form (CLO.7.5)

01720 Project Record Documents

- Closeout Submittal (CLO.7.2)

01740 Warranties and Guarantees

- Contractor's Guarantee (CLO.7.3)

01750 Systems Demonstration, Training and Start-up

- Equipment/Systems Acceptance Form (CLO.2.1)
- Owner Training Register (CLO.2.2)

END OF SECTION 01600

SECTION 01630
PRODUCT SUBSTITUTIONS

1. WORK INCLUDED

1.1. Furnish and install Products specified, under options and conditions for substitutions stated in this Section.

2. BIDDER'S OPTIONS

2.1. For products that are specified only by reference standard, select Product meeting that is standard by any manufacturer.

2.2. For Products specified by naming several Products or manufacturers, select any one of products and manufacturers named which complies with Specifications.

2.3. For Products specified by naming several Products or manufacturers and stating "or equivalent", or "or equal", or "or Architect approved equivalent", or similar wording, submit a request as for substitutions, for any Product or manufacturer which is not specifically named for review and approval by the Architect.

2.4. For Products specified by naming only one Product and manufacturer, there is no option and no substitution will be allowed.

3. SUBSTITUTION PROCESS

3.1. SUBSTITUTIONS

3.1.1. Base Bid shall be in accordance with the Contract Documents.

3.1.2. Substitutions for products may be made during the bidding period by submitting completed Substitution Request Form and substantiating product data/literature a minimum of ten (10) Days prior to Bid date to CM who will then forward to the Architect.

3.1.2.1. Architect will consider requests from the Bidder for substitution of products in place of those specified as set forth in this section.

3.1.2.2. Those submitted the specified calendar days prior to Bid Date will be included in an addendum if acceptable.

3.1.2.3. After the end of the bidding period, requests will be considered only in case of Product unavailability or other conditions beyond the control of Contractor.

3.1.2.4. Bid Proposals shall not be based on assumed acceptance of any item which has not been approved by addendum.

3.1.3. Bidders are required to submit a separate Substitution Request Form for each proposed substitution. Each substitution request should be accompanied by the following supporting documentation:

3.1.3.1. A full explanation of the proposed substitution.

3.1.3.2. Complete data substantiating compliance of the proposed substitution with the requirements stated in the Contract Documents.

3.1.3.2.1. Product identification, including the manufacturer's name and address.

3.1.3.2.2. Manufacturer's literature; identifying:

3.1.3.2.2.1. Product description and technical information.

3.1.3.2.2.2. Reference standards.

3.1.3.2.2.3. Performance and test data.

3.1.3.2.2.4. Installation instructions, operating procedures and other like information.

3.1.3.2.3. Samples, as applicable.

3.1.3.2.4. Names and addresses of similar projects on which product has been used, and date of each installation.

3.1.3.3. Itemized comparison of the proposed substitution with the product specified, listing all significant variations.

3.1.3.4. Data relating to changes in delivery or construction schedule.

3.1.3.5. A list of all effects of the proposed substitution on separate contracts.

3.1.3.6. Accurate cost data comparing the proposed substitution with the product specified.

3.1.3.6.1. Amount of any net change to Contract Sum.

3.1.3.7. Designation of required license fees or royalties.

3.1.3.8. Designation of availability of maintenance services and sources of replacement materials.

3.1.4. Substitutions will not be considered for acceptance when:

3.1.4.1. They are indicated or implied on shop drawings or product data submittals without a formal request from Bidder.

3.1.4.2. Acceptance will require substantial revision of Contract Documents.

3.1.4.3. In judgment of Architect, do not include adequate information necessary for a complete evaluation.

3.1.4.4. If requested after Contract Award directly by a subcontractor or supplier, except for special or unusual circumstances reviewed by the Contractor with CM.

3.1.5. Substitute products shall not be ordered or installed without written acceptance of Architect.

3.1.6. Architect will determine acceptability of proposed substitution.

3.2. BIDDER'S REPRESENTATION

3.2.1. In making formal request for substitution the Bidder represents that:

3.2.2. It has investigated the proposed product and has determined it is equivalent to or superior in all respects to the product specified.

3.2.3. It will provide same warranties or bonds for the proposed substitution as required for the product specified.

3.2.4. It will coordinate installation of the accepted substitution into the Work, and will make such changes as may be required for the Work to be complete in all respects.

3.2.5. It waives all claims for additional costs caused by or arising from the substitution which may subsequently become apparent.

3.2.6. Cost data is complete and includes related costs under its Agreement, but not:

3.2.6.1. Costs under separate contracts.

3.2.6.2. Architect’s costs for redesign or revision of Contract Documents.

3.2.7. Cost data need not be submitted, if request is for inclusion in an addendum. Requests after the Agreement is awarded shall contain a complete cost comparison.

3.2.8. Any modifications necessary as a result of the use of an approved substitute shall be paid by the Contractor proposing the substitution.

3.2.9. Any additional engineering costs required to be performed by the Architect to approve, implement or coordinate the substitution above reasonable review services, shall be paid by the Contractor proposing the substitution.

3.2.10. Under no circumstances will the Architect be required to prove that a product proposed for substitution is or is not equal to the quality of the product specified.

3.3. ARCHITECT'S DUTIES

3.3.1. Review requests for substitutions with reasonable promptness.

3.3.2. Coordinate review/approval of "Architect Approved" substitutions with the Owner prior to notifying the CM.

3.3.3. Issue a written instruction of decision to accept the substitution.

3.3.4. Substitution requests that are not approved will be returned to the party submitting the request with an explanation for the rejection.

3.4. SUBSTITUTION REQUEST FORM

3.4.1. The form is attached to this Section.

3.4.2. SUBSTITUTIONS WILL BE CONSIDERED ONLY WHEN THE ATTACHED FORM IS COMPLETED AND INCLUDED WITH THE SUBMITTAL WITH ALL BACKUP DATA.

SUBSTITUTION REQUEST FORM

TO: Barton Malow Company

We hereby submit for your consideration the following product instead of the specified item for the above Project:

DRAWING NO.: _____ **DRAWING NAME**: _____

SPEC. SECT.	**SPEC. NAME**	**PARAGRAPH**	**SPECIFIED ITEM**

Proposed Substitution:

Attached complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.

Submit with request all necessary samples and substantiating data to prove equal quality and performance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance.

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item.

Submitted by:

_____ _____

Signature Title

_____

Firm

_____

Address

_____ _____

Telephone Date

Signature shall be by person having authority to legally bind his/her firm to the above terms. Failure to provide legally binding signature will result in retraction of approval.

For use by Architect

____ Accepted _____ Accepted as noted

____ Not accepted _____ Received too late

____ Insufficient data received

By: _____

Date: _____

For use by Owner

____ Accepted _____ Accepted as noted

____ Not accepted _____ Received too late

____ Insufficient data received

By: _____

Date: _____

Fill in blanks below (attach additional sheets as required):

A. Does the Substitution affect dimensions shown on Drawings?

Yes_____ No _____ If yes, clearly indicate changes: _____

_____

B. Will the undersigned pay for changes to the building design, including engineering and detailing costs caused by the requested substitution?

Yes_____ No _____ If no, fully explain: _____

_____

C. What affect does substitution have on other contracts or other trades?

_____

D. What affect does substitution have on the delivery and construction schedule? _____

_____

E. Manufacturer's warranties of the proposed and specified items are: Same _____ Different_____

If different, explain on an attachment.

F. Reason for Request: _____

_____

G. Itemized comparison of specified item(s) with the proposed substitution; list significant variations:

_____

H. Accurate cost data comparing proposed substitution with product specified:

_____

I. This substitution will amount to a credit or an extra cost to the Owner of:

_____ Dollars

($ _____)

END OF SECTION 01630

SECTION 01700
CONTRACT CLOSE-OUT

1. CLOSE-OUT PROCEDURE

1.1. The following procedure and forms will be used to sequentially progress through the contract close-out stage in a productive and timely manner.

1.1.1. PREPARATION FOR CONTRACT CLOSE-OUT

During the course of the Project, the Contractor will thoroughly review the Contract Documents as it relates to the requirements and obligations and gather and submit to CM the proper submittals, shop drawings, material certifications, waivers, certificates of insurance, bonds, and other contractual requirements impacting contract close-out.

1.1.2. INITIATING THE FINAL CLOSE-OUT PROCESS

When nearing 75% completion of the Work, the Contractor will review the status of the Close-Out process with CM. The Contractor's contractual responsibilities will be reviewed and outstanding close-out and other submittals identified.

1.1.3. OBTAINING THE CERTIFICATE OF SUBSTANTIAL COMPLETION

As the Contractor is nearing the completion of the Work and after concurrence with CM, it shall submit a written request for Substantial Completion, all required documentation as outlined, and a listing of all minor deficiencies yet to be completed.

The following documents are the minimum required at the time of request for Substantial Completion. Contractor shall also submit all additional documentation as required in the Contract Documents:

1.1.3.1. AIA G704 Certificate of Substantial Completion

1.1.3.2. As-built records

1.1.3.3. Operation and Maintenance Manuals

1.1.3.4. Keys, Maintenance Stock, and Spare Parts

1.1.3.5. Test and Start-up/Owner Training Sessions

1.1.3.6. Submission of Permits and Approvals (i.e. Fire Marshal, Department of Public Health Approvals, etc.)

1.1.3.7. Guarantee and Warranties

1.1.3.8. Punchlist (list of work to be completed or corrected)

Once CM has received all required documents they will be forwarded to the Architect and Owner. CM will review the Contractor's request for Substantial Completion; all above documentation, and list of deficiencies, add appropriate comments, and forward to the Architect and/or Owner for review. In conjunction with the Contractor, CM will establish a schedule for the completion of all listed items, which in no event shall exceed any time periods established in the Contract Documents for Final Completion.

When the Architect determines that the Work is substantially complete, the Certificate of Substantial Completion shall be issued to the Contractor.

1.1.4. CONTRACTOR COMPLETES PUNCHLIST WORK

Each Contractor shall submit a letter certifying all punchlist items are completed, in a manner acceptable to the Owner, CM and the Architect.

1.1.5. FINAL INSPECTION NOTICE

Each Contractor is to forward **(written notice and accompanying documentation)** to CM that Work is ready for final inspection and acceptance. CM will forward written notice to the Architect if CM is in agreement that Work is complete. The Architect will perform a final inspection and sign off on the punchlist form if Work is in fact completed. If punchlist work is not found complete, the Contractor shall take action to remedy any insufficiencies and then shall re-submit the written notice and accompanying documentation that Work is ready for **final** inspection and acceptance. If CM and/or Architect are required to perform more than 2 site visits to determine Substantial or Final Completion of Contractor's Work, the costs for such additional inspections shall be charged to Contractor.

The following documents are the minimum required to complete final payment. Contractor shall also submit all additional documentation as required in the Contract Documents:

1.1.5.1. Final Payment Request (on G702 & G703).

1.1.5.2. Guarantees/Warranties (including subs and suppliers).

1.1.5.3. Final Sworn Statements (including subs and suppliers).

1.1.5.4. Acknowledgment of Payment and Partial Unconditional Release

1.1.5.5. Final Release Subcontractor/Materialman

1.1.5.6. Certified Payroll Report (projects governed by prevailing wage laws)

1.1.5.7. Verification of Rate Classification and Payment (Federal projects)

1.1.5.8. Consent of Surety Company to Final Payment (AIA G707)

1.1.5.9. Consent of Surety to Reduction or Partial Release of Retainage (AIA G707A)

1.1.5.10. Certificate of Substantial Completion (on G704).

1.1.5.11. Completion and acceptance of all punchlist Work.

Items 1.1.5.2 through 1.1.5.5 must always be submitted with the final request for payment.

1.1.6. REVIEW OF FINAL PAYMENT REQUEST

CM and the Architect will review the Contractor's final payment request and Close-Out file. If all administrative documents are attached or have been submitted (i.e. guarantee, warranty, waiver of lien, etc.), all Work is complete, and all other responsibilities are met, the Project Team will forward the Contractor's Application for Final Payment to the Owner and payment shall be processed according to the Owner's regular procedures.

2. FINAL COMPLETION

2.1. To attain final completion, the Contractor shall complete activities pertaining to Substantial Completion, and complete Work on punch list items. Only then shall it issue written request to CM to conduct a site visit to determine Final Completion.

2.2. When Contractor considers the Work is finally complete, it shall submit written certification that:

2.2.5. Contract Documents have been reviewed.

2.2.6. Work has been inspected for compliance with Contract Documents.

2.2.7. Work has been completed in accordance with Contract Documents.

2.2.8. Equipment and systems have been tested in the presence of the Owner's representative and are operational.

2.2.9. Work is completed and ready for final observation.

2.3. CM and/or Architect will make an observation to verify the status of completion with reasonable promptness after receipt of such certification.

2.4. Should CM and/or Architect consider that the Work is incomplete or defective:

2.4.5. CM will promptly notify the Contractor in writing, listing the incomplete or defective Work.

2.4.6. Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to the CM that the Work is complete.

2.4.7. CM and/or Architect will re-inspect the Work.

2.5. When CM and/or Architect determines that the Work is acceptable under the Contract Documents, it shall request the Contractor to make close-out submittals.

3. CONTRACTOR'S CLOSE-OUT SUBMITTALS

3.1. Evidence of compliance with requirements of governing authorities (state, local or federal):

3.1.5. Certificates of Inspection:

3.1.5.1. Mechanical

3.1.5.2. Electrical

3.1.5.3. Others as required

3.2. Project Record Documents: Refer to requirements of Section 01720.

3.3. Operating and Maintenance Data, Instructions to Owner's Personnel: Refer to requirements of Section 01730.

3.4. Warranties and Bonds: Refer to requirements of Individual Sections and Individual Technical Specifications and Section 01740.

3.5. Spare Parts and Maintenance Materials: Refer to requirements of Individual Technical Specifications.

3.6. Evidence of Payment and Release of Liens: Refer to requirements of General and Supplementary Conditions and Section 01290.

END OF SECTION 01700

SECTION 01720
PROJECT RECORD DOCUMENTS

1 SUMMARY

1.01 Each Contractor shall be responsible to maintain at the job site one copy of:

1.01.1 Record Contract Drawings

1.01.2 Record Project Manual

1.01.3 Addenda

1.01.4 Reviewed/Approved Shop Drawings

1.01.5 Change Orders

1.01.6 Other modifications to Contract

1.01.7 Field test records

1.01.8 Affidavits

1.02 Store documents apart from documents used for construction.

1.03 Maintain documents in clean, dry, legible condition.

1.04 Do not use project record documents for construction purposes.

1.05 Make documents available for inspection by the Owner, CM and the Architect.

1.06 Failure to maintain documents up-to-date will be cause for withholding payments to Contractor**.**

1.07 At the outset of the project, obtain from the Architect through the CM, at no charge to the Contractor, one complete set of Contract Documents including:

1.07.1 Technical Specifications with all addenda.

1.07.2 One complete set of prints of all Drawings.

2 RECORDING

2.01 Label each document "Project Record."

2.02 Keep record documents current.

2.03 Do not permanently conceal any work until required information has been recorded.

2.04 Contract Drawings:

2.04.1 Contractor may at his option enter required information on a "working set" and then at completion of Project transfer the information to final submitted "Project Record" set.

2.04.2 Contractor shall legibly mark to record actual construction:

2.04.2.1 Depths of various elements of foundation in relation to survey data.

2.04.2.2 Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.

2.04.2.3 Location and depths of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.

2.04.2.4 Field changes of dimension and detail.

2.04.2.5 Changes made by PCO- Notice to Proceed.

2.04.2.6 Details not on original Contract Drawings.

2.05 Technical Specifications and Addenda:

2.05.1 Contractor shall legibly mark up each section to record:

2.05.1.1 Manufacturer, trade name, catalog number and Supplier of each product and item of equipment actually installed.

2.05.1.2 Changes made by PCO- Notice to Proceed.

2.05.1.3 Other items not originally specified.

2.06 Conversion of Schematic Layouts:

2.06.1 Arrangement of conduits, circuits, piping, ducts and similar items are in most cases shown schematically on the Drawings.

2.06.2 Contractor shall legibly mark to record actual construction:

2.06.2.1 Dimensions accurate to within 1" of the center of items shown schematically.

2.06.2.2 Identify each item, for example, "cast iron drain", "galvanized water", etc.

2.06.2.3 Identify location of each item, for example, "under slab", "in ceiling plenum", "exposed", etc.

2.06.3 The Owner, Architect or CM may waive requirements of schematic layout conversion, when in their opinion, it serves no beneficial purpose. Do not, however, rely on waivers being issued except as specifically issued by the CM in written form.

3 SUBMITTAL

3.01 At completion of Project deliver, 1 set of electronic sets of Record Documents, in a format acceptable to the Owner and the Architect, using the Final Document Submittal Form (in Section 01600 Forms), to CM prior to request for final payment.

3.02 Accompany submittal with transmittal letter, in duplicate, containing:

3.02.1 Date

3.02.2 Project title and number

3.02.3 Contractor's name and address

3.02.4 Title and number of each record document

3.02.5 Certification that each document as submitted is complete and accurate.

3.02.6 Signature of Contractor, or his authorized representative.

END OF SECTION 01720

SECTION 01730
OPERATIONS AND MAINTENANCE DATA

1. SCOPE

1.1. Compile product data and related information appropriate for Owner's maintenance and operation of products furnished under Contract.

1.2. Prepare operating and maintenance data as specified in this Section and as referenced in other pertinent sections of the Technical Specifications.

1.3. Instruct Owner's personnel in maintenance of products and in operation of equipment and systems in accordance with the requirements in Section 01750 Systems Demonstration, Training and Start-up.

2. QUALITY ASSURANCE

2.1. Preparation of data shall be done by personnel:

2.1.1. Trained and experienced in maintenance and operation of described products.

2.1.2. Familiar with requirements of this Section.

2.1.3. Skilled as technical writer to the extent required to communicate essential data.

2.1.4. Skilled as draftsman competent to prepare required drawings.

3. FORM OF SUBMITTALS

3.1. Prepare data in the form of an instructional manual for use by Owner's personnel.

3.2. Format:

3.2.1. Size: 8-1/2" x 11"

3.2.2. Paper: white, for typed pages.

3.2.3. Text: Manufacturer's printed data, or neatly typewritten.

3.2.4. Drawings:

a. Provide reinforced punched binder tab, bind in with text.

b. Fold larger drawings to size of text pages.

3.2.5. Provide fly-leaf for each separate product, or each piece of operating equipment.

c. Provide typed description of product, and major component parts of equipment.

d. Provide indexed tabs.

3.2.6. Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS." list:

e. Title of Project

f. Identity of separate structures as applicable.

g. Identity of general subject matter covered in the manual.

3.3. Binders:

3.3.1. Commercial quality three-ring binders with durable and cleanable plastic covers.

3.3.2. Maximum ring size: 3"

3.3.3. When multiple binders are used, correlate the data into related consistent groupings.

4. CONTENT OF MANUAL

4.1. Neatly typewritten table of contents for each volume, arranged in systematic order.

4.1.1. Contractor, name of responsible principal, address and telephone number.

4.1.2. A list of each product required to be included, indexed to content of the volume.

4.1.3. List with each product, name, address and telephone number of:

a. Subcontractor or installer.

b. Maintenance contractor, as appropriate.

c. Identify area of responsibility of each.

d. Local source of supply for parts and replacement.

4.1.4. Identify each product by product name and other identifying symbols as set forth in Contract Documents.

4.2. Product Data:

4.2.1. Include only those sheets which are pertinent to the specific product.

4.2.2. Annotate each sheet to:

e. Clearly identify specific product or part installed.

f. Clearly identify data applicable to installation.

g. Delete references to inapplicable information.

4.3. Drawings:

4.3.1. Supplement product data with drawings as necessary to clearly illustrate:

b. Relations of component parts or equipment and systems.

c. Control and flow diagrams.

4.3.2. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.

4.3.3. Contractor may use Project Record Documents as maintenance drawings - coordinate with CM.

4.4. Written text, as required to supplement product data for the particular installation:

4.4.1. Organize in consistent format under separate headings for different procedures.

4.4.2. Provide logical sequence of instructions for each procedure.

4.5. Copy of each warranty, bond and service contract issued.

4.5.1. Provide information sheet for Owner's personnel, give:

a. Proper procedures in event of failure.

b. Instances which might affect validity of warranties or bonds.

5. MANUAL REVIEW AND PREPARATION SCHEDULE

5.1. Submit two copies of preliminary draft of proposed formats and outlines of contents to CM prior to start of preparation.

5.1.1. Architect will review draft and return one copy with comments.

5.2. Submit 1 set of electronic copy of completed data in final form to the CM at least 2 months before the end of the project, for Owner review.

5.2.1. Copy will be returned after final inspection or acceptance, with comments.

5.3. Submit copies of completed operation and maintenance manuals at least two (2) weeks before execution and have at hand for use in demonstrations and instructions.

5.4. Submit specified number of copies of approved data in final form to the CM ten (10) days after final inspection or acceptance.

6. PRODUCTS

6.1. MANUAL FOR MATERIALS AND FINISHES

6.1.1. Submit 1 electronic copy of complete manual in final form.

6.1.2. Content, for architectural products, applied materials and finishes:

6.1.2.1. Manufacturer's data, giving full information on products.

6.1.2.1.1. Catalog number, size, and composition.

6.1.2.1.2. Color and texture designations.

6.1.2.1.3. Information required for reordering special-manufactured products.

6.1.2.2. Instructions for care, maintenance and preventative maintenance.

6.1.2.2.1. Manufacturer's recommendation for types of cleaning agents and methods.

6.1.2.2.2. Cautions against cleaning agents and methods which are detrimental to product.

6.1.2.2.3. Recommended schedule for cleaning and maintenance.

6.1.3. Content, for moisture-protection and weather-exposed products:

6.1.3.1. Manufacturer's data, giving full information on products.

6.1.3.1.1. Applicable standards.

6.1.3.1.2. Chemical composition.

6.1.3.1.3. Details of installation.

6.1.3.2. Instructions for inspection, maintenance and repair.

6.1.4. Additional requirements for maintenance data: Reference sections of Technical Specifications.

6.2. MANUAL FOR EQUIPMENT AND SYSTEMS

6.2.1. Submit 1 electronic copy of complete manual in final form.

6.2.2. Content, for each unit of equipment and system, as appropriate:

6.2.2.1. Description of unit and component parts.

6.2.2.1.1. Function, normal operating characteristics, and limiting conditions.

6.2.2.1.2. Performance curves, engineering data and tests.

6.2.2.1.3. Complete nomenclature and commercial number of replaceable parts.

6.2.2.2. Operating procedures:

6.2.2.2.1. Start-up, break-in, routine and normal operating instructions.

6.2.2.2.2. Regulation, control, stopping, shutdown and emergency instructions.

6.2.2.2.3. Summer and winter operating instructions.

6.2.2.2.4. Special operating instructions.

6.2.2.3. Maintenance and Preventative Maintenance Procedures:

6.2.2.3.1. Routine operations.

6.2.2.3.2. Guide to "trouble-shooting".

6.2.2.3.3. Disassembly, repair and re-assemble.

6.2.2.3.4. Alignment, adjusting and checking.

6.2.2.4. Servicing and lubrication schedule.

6.2.2.4.1. List of lubricants required.

6.2.2.5. Manufacturer's printed operating and maintenance instructions.

6.2.2.6. Description of sequence of operation by control manufacturer.

6.2.2.7. Original manufacturer's parts, list, illustrations, assembly drawings and diagrams required for maintenance.

6.2.2.7.1. Predicted life of parts subject to wear.

6.2.2.7.2. Items recommended to be stocked as spare parts.

6.2.2.8. As-installed control diagrams by controls manufacturer.

6.2.2.9. Each Contractor's coordination drawings.

6.2.2.9.1. As-installed color coded piping diagrams.

6.2.2.10. Charts of valve tag numbers, with location and function of each valve.

6.2.2.11. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

6.2.2.12. Other data as required under pertinent sections of specifications.

6.2.3. Content, for each electric and electronic system, as appropriate:

6.2.3.1. Description of system and component parts.

6.2.3.1.1. Function, normal operating characteristics and limiting conditions.

6.2.3.1.2. Performance curves, engineering data and tests.

6.2.3.1.3. Complete nomenclature and commercial number of replaceable parts.

6.2.3.2. Circuit directories of panel boards.

6.2.3.2.1. Electrical service.

6.2.3.2.2. Controls.

6.2.3.2.3. Communications.

6.2.3.3. As-installed color coded wiring diagrams.

6.2.3.4. Operating procedures:

6.2.3.4.1. Routine and normal operating instructions.

6.2.3.4.2. Sequences required.

6.2.3.4.3. Special operating instructions.

6.2.3.5. Maintenance and preventative maintenance procedures:

6.2.3.5.1. Routine operations.

6.2.3.5.2. Guide to "trouble-shooting".

6.2.3.5.3. Disassembly, repair and re-assemble.

6.2.3.5.4. Adjustment and checking.

6.2.3.6. Manufacturer's printed operating and maintenance instructions.

6.2.3.7. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

6.2.3.8. Other data as required under pertinent sections of specifications.

6.2.4. Prepare and include additional data when the need for such data becomes apparent during instruction of Owner's personnel.

6.2.5. Additional requirements for operating and maintenance data: Reference sections of Technical Specifications.

END OF SECTION 01730

SECTION 01740
WARRANTIES AND GUARANTEES

1 GENERAL

1.01 Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

2 WARRANTY REQUIREMENTS

2.01 Deliver all written warranties and guarantees required by the Contract Documents with the Owner named as beneficiaries. All warranties shall include labor and materials, shall be signed by the manufacturer or subcontractor as the case may be, and countersigned by the Contractor. All written warranties shall be addressed to the Owner and delivered to CM upon completion of the Project, before or with the submission of Request for Final Payment.

2.02 In addition to all other warranties set forth in the Contract Documents or imposed by applicable law, Contractor warrants to Owner and CM that the Work will be free from defects and performed in strict conformity with the requirements of the Contract Documents. This warranty survives the termination of the Agreement and shall only be extinguished by limitation periods imposed by applicable law and shall not be limited by any other provisions contained in the Agreement, including any provisions or time periods related to Contractor's obligation to correct defective Work.

2.03 Contractor, upon signing the Agreement, shall obtain and forward to CM any and all Standard Product Warranties for products, materials and systems covered under its Agreement. The Manufacturer's warranties do NOT relieve the Contractor from its warranty obligations under the Contract Documents.

2.04 Special Warranties shall become effective on a date established by the Project Team. This date generally shall be the date of Final Completion of the Project or Substantial Completion of the Project or portions thereof as agreed upon by the Project Team. In the case of acceptance of a portion of the Work or Project, separate warranties shall be issued for those specific portions of the Project that were accepted, and shall be dated the date the specific portion was accepted. As additional Work is accepted, separate warranties for those specific portions of the Work shall be issued and properly dated. Issuance of warranties for a portion of the Work shall in no way become the basis for Application for Final Payment.

2.05 If for any reason, the Bidder cannot warrant any part of the Work using products, materials, or construction methods that have been specified or shown, it shall notify CM in writing at least ten (10) days before the bid submission date, giving reasons together with the names of products and data on substitutions it can guarantee. Should the Bidder fail to so notify CM within this time period, it will be bound to all warranties and guarantees as set forth in the Contract Documents.

2.06 Related Damages and Losses: In correcting Work that has been rejected as defective or otherwise failing to conform to the Contract Documents, whether before or after Substantial Completion, Contractor shall bear all related costs, including, but not necessarily limited to, the cost to correct the Work, the cost to correct all other Work that has been damaged by the defective or non-conforming Work, or that is damaged in the process of correcting the defective or nonconforming Work, and the cost of all additional testing and inspections and compensation for the Architect and/or CM's services and expenses made necessary thereby.

2.07 Reinstatement of Warranty: When Work covered by a warranty with a specific time period has failed and has been corrected by Contractor, the warranty shall be reinstated for a time period equal to the original warranty.

2.08 Express warranties are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available to the Owner or CM under the law. Express warranty periods shall not be interpreted as limitations on the time in which Owner or CM may enforce Contractor's duties and obligation or their rights and remedies under the Agreement and applicable law.

2.08.1 Rejection of Warranties: The Owner and CM reserve the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

2.09 Where the Contract Documents require a Special Warranty, or similar commitment on the Work or part of the Work, the Owner and CM reserve the right to refuse to accept the Work, until the Contractor presents evidence that the entities required to countersign such commitments are willing to do so.

3 SUBMITTALS

3.01 Submit electronic copies of the warranties to the CM within fourteen (14) days of Substantial Completion using the form found in section 01600-Forms and organizing the warranty documents into an orderly sequence based on the table of contents of the Project Manual. If the project Team's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of CM.

3.02 When the Contract Documents require Contractor, or Contractor and a Subordinate Party to execute a Special Warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the CM for approval prior to final execution.

3.03 Forms for warranties are included in Section 01600-Forms. Prepare a written document utilizing the appropriate form, ready for execution by Contractor and its Subordinate Party(ies). Submit a draft to CM for approval prior to final execution.

END OF SECTION 01740

SECTION 01750
SYSTEMS DEMONSTRATION, TRAINING AND START-UP

2 GENERAL

2.01 COORDINATE Procedures for demonstration of equipment operation and instruction of Owner's personnel through CM.

3 QUALITY ASSURANCE

3.01 When specified in individual Sections, require manufacturer to provide authorized representative to demonstrate operation of equipment and systems, instruct Owner's personnel, and provide written report that demonstrations and instructions have been completed.

3.02 CM will provide list of personnel to receive instructions, and will coordinate their attendance at agreed-upon times.

4 SUBMITTALS

4.01 Submit preliminary schedule to CM for Architect's and Owner's approval, listing times and dates for demonstration of each item of equipment and each system, at least two (2) weeks prior to proposed dates.

4.02 Submit electronic copies of the reports within one week after completion of demonstrations, that demonstrations and instructions have been satisfactorily completed. Give time and date of each demonstration, and hours devoted to demonstration, with a list of persons present.

5 PREPARATION

5.01 Provide substantiating information that verifies equipment has been inspected and put into operation; testing, adjusting, and balancing has been performed; and equipment and systems are fully operational.

5.02 Submit copies of completed operation and maintenance manuals at least two (2) weeks before execution and have at hand for use in demonstrations and instructions.

5.03 CM will develop a schedule for the system demonstration, training, start-up and turn over of all systems and equipment.

6 DEMONSTRATION AND INSTRUCTIONS

6.01 Demonstrate operation and maintenance of equipment and systems to the Owner’s, CM’s and Architect's personnel two (2) weeks prior to date of final inspection. For equipment requiring seasonal operation, perform instructions for other seasons within six months. Contractor shall document the testing, equipment start-up and training sessions as required using the following forms in Section 01600 Forms:

6.01.1 Equipment/System Acceptance - This form will be completed for each piece of equipment or system for each contract that requires operational testing and/or training before acceptance. This will document the date of testing, the equipment tested, names of personnel which witnessed the testing and acceptance.

6.01.2 Owner Training Register - This form will be completed for each contract that requires training to be provided to the Owner’s personnel. This will document the date of training, type of training, names of the personnel trained and acceptance of the training.

6.02 The amount of time required for instruction on each item of equipment and system is that specified in individual sections or as mutually agreed upon between Contractor and CM.

6.03 Demonstrate start-up, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at designated location.

6.04 Use operation and maintenance manuals as basis of instruction and review the contents of the manuals with personnel in full detail to explain all aspects of operations and maintenance.

6.05 Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instructions.

6.06 Contractor is responsible for video taping the training sessions. The videotape should be of professional quality and the Owner should be provided with three (3) copies of the videotape.

END OF SECTION 01750

PROJECT MANUAL FOR THE CONSTRUCTION OF:

PROJECT:

TROY SCHOOL DISTRICT
NEW EARLY CHILDHOOD CENTER PLAYGROUND AND SIGNAGE

BID PACKAGE NO. 4

OWNER:

TROY SCHOOL DISTRICT
4400 Livernois
Troy, Mi. 48098

TMP PROJECT NO.: 16129

DATE: NOVEMBER 30, 2018

ISSUED FOR BIDS

ARCHITECT

TMP ARCHITECTURE, INC.
1191 West Square Lake Road
Bloomfield Hills, Michigan 48302-0374

PH (248) 338-4561
FX (248) 338-0223
Email info@tmp-architecture.com

CONSTRUCTION MANAGER

BARTON MALOW COMPANY
26500 American Drive
Southfield, Mi. 48034

PH (248) 436-5000
FX (248) 436-5001
Email info@bartonmalow.com

LANDSCAPE ARCHITECT

FORESITE DESIGN, INC.
3269 Coolidge Highway
Berkley, Michigan 48072

PH (248) 547-7757
FX (248) 547-0218

TABLE OF CONTENTS

DIVISION 33 – UTILITIES

Sections

END OF SECTION

LIST OF DRAWINGS

1.1 LIST OF DRAWINGS

A. Drawings: Drawings consist of the Contract Drawings and other drawings listed on the TITLE SHEET page of the separately bound drawing set titled TROY ECC PLAYGROUND AND SIGNAGE, dated November 30, 2018, and any subsequent Addenda and Contract modifications which may occur.

END OF SECTION

AVAILABILITY OF ELECTRONIC FILES

PART 1 – GENERAL

1.1 POLICY

A. As a service to contractors, subcontractor, vendors, material suppliers and others needing electronic copies of drawing files, 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 harmless and indemnify TMP Architecture from all claims, liabilities, losses, etc., including attorney's fees arising out of the use or misuse of the transferred items.

3. 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 2009 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 will prepare a duplicate electronic back-up for its record.

6. Compensation 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 $40.00 per drawing (i.e., 11 drawings = $540).

7. Payment must be provided along with a signed copy of the Release Letter before files will be released.

1.2 REQUEST PROCEDURE

A. To receive files the attached Release Letter must be completed in full and submitted to the Construction Manager to be forwarded to the Project Manager at TMP Architecture.

1. A signed copy of the Release Letter must be submitted; faxed or emailed copies will be accepted.

2. Upon remittance of the signed Release Letter and Fee, allow five working days for processing.

3. Transmission of documents will be provided electronically after the receipt of payment.

Date: _____

Firm Requesting Files:
Name: _____
Company: _____
Address: _____
City, State, Zip: _____

Re: Letter of Authorization for CAD File Transfers
Project Name: _____
TMP Project No. : _____ Bid Pack No. : _____

Dear Sir:

Per your request, TMP Architecture will transmit the requested CAD files in the form of CD-ROM upon receipt of an original signed copy of this letter with conditions of agreement as stated.

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 harmless and indemnify TMP Architecture from all claims, liabilities, losses, etc., including attorney's fees arising out of the use or misuse of the transferred items.

3. It is understood and agreed that the items transmitted are prepared from CAD files current at the time of preparation. All files are AutoCAD 2009.

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, we will prepare a duplicate back-up for our files, which may be electronic or hard-copy.

6. Compensation for providing this material will be as follows: Base Fee of $250 for 1 to 3 drawings and a Base Fee of $500 for 4 to 10 drawings; for each additional drawing after 10 the fee is $40.00 per drawing (i.e., 11 drawings = $540). Payment must be provided along with a signed copy of this form before files will be released. Please remit to TMP Architecture and allow five working days for processing.

Fee: $_____ Drawings: _____

Signed: _____ Printed Name/Title: _____

Firm Requesting: _____

Phone: _____ Fax: _____

To Be Completed By TMP Architecture, Inc.

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

Printed Name/Title: _____ Date: _____

END OF SECTION

ALTERNATES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF REQUIREMENTS:

A. Definition: An alternate is an amount proposed by Bidders and stated on the Bid Form that will be added to or deducted from Base Bid amount if the Owner decides to accept a corresponding change in either scope of work or in products, materials, equipment, systems or installation methods described in Contract Documents.

B. Coordination: Coordinate related work and modify or adjust adjacent work as required to ensure that work affected by each accepted alternate is complete and fully integrated into the project.

C. Notification: Immediately following award of Contract, prepare and distribute to each party involved, notification of the status of each alternate. Indicate whether alternates have been accepted, rejected of deferred for consideration at a later date. Include a complete description of negotiated modifications to alternates, if any.

D. Schedule: A "Schedule of Alternates" is included at the end of this section. Specification sections referenced in the Schedule contain requirements for materials and methods necessary to achieve the work described under each alternate.

1. Include as part of each alternate, miscellaneous devices, appurtenances and similar items incidental to or required for a complete installation whether or not mentioned as part of the alternate.

PART 2 - PRODUCTS (not applicable)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No.A1 - Quote add in price to: Provide and install Large Play Structure as shown on Sheet L1.01 and specifications

B. Alternate No.A2 – Quote add in price to: Provide and install Beached Ship as shown on Sheet L1.01 and specifications

C. Alternate No.A3 – Quote add in price to: Provide and install (2) picnic tables

D. Alternate No.A4 – Quote add in price to: Provide and install (2) storage sheds

END OF SECTION

ELECTRONIC SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Specified Herein: General Requirements for preparation, submittal, and distribution of Shop Drawings, Samples, Product Data, and similar information required to be furnished by the Contractors by electronic means.

B. Related Work: The following items of work are specified under other Sections of these Specifications:

1. Division 01 Section "Project Record Documents" for project record documents.

1.2 DEFINITIONS

A. Samples: See General Conditions.

1. Preliminary Samples: Hand made or simulated examples or proposed materials submitted to demonstrate anticipated finished appearance.

2. Product Samples: Representative examples of materials proposed for use.

3. Range Samples: Samples showing extremes of variations in appearance, texture or color and the limits within which the Contractor agrees to hold the materials used in the work.

4. Sample Installation: Trial run or initial example provided for review and acceptance by the Architect before continuing with the work.

5. Test Samples: Samples provided for purposed of physical or chemical test analysis. If samples are submitted directly to the Testing Laboratory, submit copy of letter of transmittal.

B. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

C. Portable Document Format (PDF): Adobe Acrobat (www.adobe.com), Bluebeam PDF Revue (www.bluebeam.com) or other similar PDF review software for applying electronic stamps and comments for representing documents in a device-independent and display resolution-independent fixed-layout document format.

D. Shop Drawings: See General Conditions

1. Electronic File: Drawings and other data submitted electronically in PDF format only.

2. Preliminary Shop Drawings: Drawings and other data submitted electronically prior to acceptance of systems and only required to show information necessary for evaluation and coordination with other work.

3. Project Shop Drawings: Drawings and other data illustrating materials and assemblies proposed for the Project.

4. Coordination Drawings: Original electronic drawings prepared by the Trades to investigate conflicts and coordinate locations of each with the work of the other.

E. Identification: All shop drawings, samples and product data shall be identified by the project title, the Architect's name and the Architect's project number or numbers.

1.3 SUBMITTALS IN ELECTRONIC FORM:

A. Contractors to submit shop drawings and product data in electronic form. Submittals are to be made to the Construction Manager in the following form.

1. Shop drawing: Combined together into one pdf file for each assembly or product.
2. Product data: Provide product data in individual pdf file.

B. File naming shall be in the following format. (Specification Section Number-consecutive number of submittal for that section) Description of file being submitted.

1. Example: (079200-01) Joint Sealants.pdf

B. Contractor shall fill out Submittal Transmittal found at the end of this Section and include at the beginning of the file. PDF version of Submittal Transmittal form is available upon request from the Architect.

C. Physical Samples must be submitted through the Construction Manager and must be accompanied by an electronic (PDF) copy of the completed TMP Shop Drawing and Transmittal Form.

D. Construction Manager shall provide a reasonable means of transmitting files. Either through a data management provider (i.e. Submittal Exchange) or an established data management system specifically for the Project by Construction Manager or an approved method agreed to by the Architect and Owner.

1.4 SCHEDULES

A. Prepare Sample and Shop Drawing Submittal Schedule as required.

B. Recognize and allow for lead-time required for manufacture, fabrication, delivery to the site, and for review.

C. Arrange schedule in orderly sequence in compliance with Project Schedule.

D. Request for approval of materials, systems, substitutions, or for deviations from the Contract Documents shall be submitted according to Section 016000 – “Product Requirements” and shall be Preliminary submittal with allowances for time for review prior to submittal of Product Samples or Project Shop Drawings.

1.5 SAMPLES - GENERAL

A. Samples in general, are required for all materials that form an exposed part of the finished Project. Samples of concealed components are not required unless specifically called for.

B. Typical Samples shall be taken from production run material and shall be representative examples of proposed quality and finish.

C. Preliminary Samples shall, as far as possible, anticipate the quality and finish of production run material.

D. Samples will be retained at the job site for comparison purposes. Samples of manufactured items will be returned to the Contractor for installation in the Work after approval of materials. Use in locations where directed.

E. All materials in the completed installation shall be equal in every respect to the approved product samples and within the limits defined by the approved range samples.

1.6 SAMPLES SUBMITTALS

A. Size and quantity, unless otherwise specified: Four (4) each; 8 inches by 12 inches, or 12 inches long, as applicable; not over one inch thick for masonry or cementitious materials.

B. Preliminary or Range Samples shall be resubmitted as directed until an acceptable Sample or Range is established, at which time Project Samples shall be submitted.

C. Furnish Samples to other trades where required to match color or finish.

D. Required Samples are scheduled or are listed in the Trade Sections. Optional Samples will be accepted and reviewed by the Architect.

E. Review will be for shape and appearance only. Physical and chemical properties shall be established by adequate documentation that shall accompany samples.

F. In all cases where preliminary approval samples have been submitted, final production run, or in-place installation samples will be required for verification.

G. Notify Architect in advance and obtain directions for place and time to ship large, heavy or bulky samples. Ship such samples "Prepaid." If return is requested, they will be returned "Collect."

1.7 SHOP DRAWINGS AND PRODUCT DATA - GENERAL

A. Shop Drawings shall be prepared by a qualified detailer and shall be complete including erection diagrams and shall show the fabrication and construction of all items required for complete assembly.

B. Provide pertinent information relating to installation and connection to work of other trades, and coordinate with work of other trades as required for proper placing, anchorage and support of the work. Indicate in detail, the precise location and spacing of all embedded anchor bolts, sleeves and other features required to be placed in the concrete, structural steel or masonry or otherwise required to be built into the structure.

C. Identify details by reference to the Contract Drawings, other Shop Drawings or other information as required to properly identify and locate the portion of the Work covered.

D. Indicate on the Drawings and explain by covering letter all proposed deviations from the requirements of the Contract Documents.

E. Manufacturer's Standard Documents:

1. Drawings and similar documents submitted as PDF electronic document from original documents: Modify drawings to delete information which is not applicable to the Project. Provide additional information where required and submit electronically.

2. Brochures and other pre-printed data, clearly mark PDF information as follows:

a. Identify pertinent material, product, and model.
b. Number or otherwise reference each item to applicable Contract Document or other Shop Drawing.
c. Show dimensions and clearances required.
d. Provide all other information required for Shop Drawings including, where applicable, wiring diagrams and controls.
e. Delete all options, or variations from the Contract Documents, except where such items are specifically noted as proposed deviations.

F. Where proper installation of the work requires that other work be set to special detail, held to tolerance, or dimension be established, so indicate on the Shop Drawings.

G. Where items must fit spaces previously constructed, take measurements at the site, not from drawings.

H. Where applicable, indicate mechanical and electrical characteristics of, or required to be provided for, the material shown on the Shop Drawings.

I. Each shop drawing or coordination drawing shall have a blank area (5 x 8 inches), located adjacent to the title block. The title block shall display the following:

1. Number and title of drawing

2. Date of drawing or revision

3. Name or project building or facility

4. Name of Contractor and (if appropriate) name of Subcontractor submitting drawings.

5. Clear identity of contents and location of the work.

6. Project title and contract number.

7. Initials or party preparing drawings.

8. Signature of party responsible and, where applicable, professional engineers seal.

1.8 SHOP DRAWING SUBMITTALS

A. Submit all Shop Drawings, required to be reviewed, to the Construction Manager, in electronic file PDF except where otherwise specified. The Construction Manager shall review the Shop Drawings prior to submitting for review by the Architect and the Engineer(s). The Architect will review and will note his comments or corrections and return electronic file. Product Data, Brochures and other pre-printed material shall be submitted electronically.

B. The Architect will return the electronic file to the Construction Manager for resubmission or final distribution, as indicated. The Contractor shall then distribute as needed whether electronically or hard copy.

C. Submittals returned with the notation "Not Approved" - "Resubmit" or "Revise and Send Record Copy" shall be promptly revised and resubmitted.

D. Contractor to furnish drawings to other contractors, electronically or hard copy, as required to prepare openings, supports, for verification of matching details, and obtain approval before submittal.

E. Required Shop Drawings are scheduled and are listed in the Technical Sections.

F. Schedule and lists of required Shop Drawings are provided for convenience of reference only and do not necessarily include all Shop Drawings necessary for completion of the Work. Procedures for additional for optional Shop Drawings will be the same as for required Shop Drawings.

1.9 SHOP DRAWINGS - TYPES

A. Preliminary Shop Drawings:

1. Preliminary Shop Drawings shall be provided for portions of the Work where interpretations or variations from the Contract Documents are proposed, or otherwise required.

B. Project Shop Drawings:

1. Project Shop Drawings shall show all changes to building details to coordinate with required modifications and indicate approval by other trades for required modifications to their work.

2. Where Shop Drawings are based on the use of a particular material, such material shall be submitted for review independently of the Shop Drawing.

3. When Shop Drawings are submitted in the form of brochures indicate all current variations from the information in effect at time documents were issued for bids.

C. Coordination Drawings:

1. Coordination Drawings unless otherwise agreed shall consist of notations in colored upon a PDF version of the Shop Drawings for the First Trade in the area of potential conflict.

2. Coordination Drawings shall be prepared for all conditions where the exercise of the installing Trade's option concerning selection or location of materials or equipment could conflict with other work.

3. First contractor: That contractor so designated by the Construction Manager. The other contractors shall review in order and sequence as directed by the Construction Manager.

4. Preparation:

   a. First contractor will prepare complete Shop Drawings at adequate scale and provide white prints at earliest practicable date.
   b. Subsequent contractors shall mark routing and layout on the print each in a different colored pencil than previously used.
   c. When drawing is completed, all parties shall meet to examine the completed layout and determine areas of conflict.
   d. The contractors shall negotiate re-routing and cooperation to resolve conflict. If they cannot agree, the Construction Manager will determine an equitable solution.
   e. Determinations shall be indicated in a Shop Drawing Submittal for review. Deviations from agreed layout shall be remedied at the expense of the Trade that did not follow agreed layout.

5. Conflicts that cannot be resolved by simple re-routing or relocation may involve a change in the work but no extra cost will be allowed for tearing out or re-building work which could have been avoided but use of Coordination Drawings.

6. Each Contractor shall be fully and individually responsible for coordination. In the event of conflict, the Trade Contractor responsible for the mislocation or ill timed work, determined by the Architect and Construction Manager, will be required to assume all costs for relocation and adjustment unless he has called attention to the conflict at the time he reviewed the coordination documents.

1.10 CONTRACTOR'S RESPONSIBILITIES

A. The Contractor shall obtain, review, stamp with his approval and submit for review all Shop Drawings and Samples required by the Contract Documents. The Construction Manager shall be required to utilize the "Shop Drawing Transmittal Form attached to this section. Only one (1) specification section trade shall be submitted per each transmittal form.

B. By approving and submitting Shop Drawings and Samples, the Contractor thereby represents that he has determined and verified all field measurements and field construction criteria at the site, and all materials, catalog numbers and similar data, or will do so, and that he has checked and coordinated each Shop Drawing and Sample with the requirements of the work and of the Work and of the Contract Documents.

C. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Owner's, Construction Manager or the Architect's acceptance or Shop Drawings, Product Data or Samples, unless the Contractor has informed the Owner, Construction Manager and the Architect, in writing, of such deviation at the time of submission and the Architect has given written acceptance to the specific deviation. The

Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data or Samples by the acceptance thereof.

D. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples to revisions other than those requested on previous submittals.

E. No portion of the Work requiring submission of Shop Drawings, Product Data or Sample shall be commenced until the submittal has been accepted as provided herein. All such portions of the Work shall be in accordance with accepted submittals.

1.11 ARCHITECT'S REVIEW

A. The Architect will complete review of Shop Drawings within fifteen (15) working days, and of Samples within twenty-one (21) working days of receipt thereof except that:

1. Shorter time limits will be negotiated on a basis of need for each specific case for "fast track" or critical path items.

2. With respect to those areas with special architectural finishes and coordination of various material sources the parties shall agree upon a mutually satisfactory time schedule.

3. Review time will be considered as starting when Drawings and Samples are substantially correct and so submitted.

4. Incomplete or incorrect submittals will be returned without review, for proper submission.

B. Shop Drawings, Samples and Product Data will be reviewed only for conformance with the design concept, compliance with the information given in the Contract Documents, arrangement and appearance. Deviations from the Contract Documents will be noted with comments and required corrections or changes will be noted on the returned submittal.

C. Shop Drawings will be returned electronically.

D. Architect will retain electronic file of Product Data and an electronic file of A-E "mark-ups" or corrections of mark-ups. The Architect will **not** accept physical copies (hard copies) of shop drawings or product data submittals. Physical submittals will be accepted for Samples only. Physical Samples must be submitted through the Construction Manager and must be accompanied by an electronic (PDF) copy of the completed TMP Shop Drawing and Sample Transmittal Form.

E. One sample from each set will be returned to the Contractor, one filed at the office of the Architect, one at the office of the Construction Manager and one at the jobsite. If the Contractor intends that samples such as hardware or fixtures be installed on the project or returned at completion of the Project, he shall indicate at time of submittal, otherwise the Owner and the Architect assume no responsibility for protection or return of such samples.

1.12 EQUIPMENT ROOM LAYOUT DRAWINGS

A. The Contractor shall prepare and submit equipment room layout drawings as required by the technical specifications and additionally for areas where equipment proposed for use could

present interface or space difficulties. Such drawings shall be prepared in the same manner as coordination drawings.

1.13 MATERIALS, EQUIPMENT AND FIXTURE LISTS

A. Where required by the Technical Provisions, lists of materials, equipment and fixtures shall be submitted by the Contractor. The lists shall be supported by sufficient descriptive material, such as catalogs, cuts, diagrams, and other data published by the manufacturer, as well as evidence of compliance with safety and performance standards, to demonstrate conformance to the specification requirements; catalog numbers alone will not be acceptable.

B. The data shall include the name and address of the nearest service and maintenance organization that regularly stocks repair parts. No consideration will be given to partial lists submitted from time to time.

C. Materials, equipment and fixtures will not be approved for use at capacity ratings in excess of manufacturer's published data.

D. Approval of materials and equipment will be tentative subject to submission of complete shop drawings indicating compliance with the Contract Documents.

TMP SHOP DRAWING AND SAMPLE TRANSMITTAL FORM

CONTRACTOR/CONST. MANAGER:	PROJECT TITLE AND LOCATION:	DATE SUBMITTED: _____ NEW _____ SUB. NO. _____
_____ _____ _____	_____ _____ _____	CHECKER: _____ RESUB. _____ RESUB. NO. _____ TMP PROJECT NO. _____

SPEC SECTION NO.	NO. PRINT	NO. SEPIA	NO. CAT.	NO. SAMPLES	SUBCONTRACTOR/MFR.	ITEM DESCRIPTION	*ACTION CODE	DATE CHECKED	DATE RETURNED	NO. COPIES

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 otherw noted. NOTE: Approval of items submitted does not relieve contractor from complying with all requirements of the contract documents.

* ACTION DEFINITION

CONTRACTOR'S COMMENTS:

ARCHITECT'S COMMENTS:

_____
CONTRACTOR'S NAME

_____
SIGNATURE

cc: Owner
Consultant

R = REVIEWED – NO EXCEPTIONS NOTED
RN = REVIEWED WITH CORRECTIONS NOTED
RR = REVISE AND SEND RECORD COPY
X = NOT APPROVED – RESUBMIT
NA = NO ACTION REQ'D

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Specified Herein: Requirements and procedures for the work and services of Independent Testing Laboratories and Consultants employed by the Owner to perform materials testing and special inspections during the course of the Work.

1.2 OWNER'S OPTION

A. The Owner will employ the services of Independent Testing Laboratories or Consultants or both to perform specified tests and inspections for the Owner's benefit. This inspection and testing shall not obligate the Owner to provide inspection or testing services, or both, for the benefit of the Contractor or any person party or agency associated with the work.

B. The Owner may, at its option, perform inspections and tests in addition to those specified herein in accordance with the General Conditions.

C. The Contractor shall provide free, safe and convenient access to the Work at all locations of the Work including the Site, Fabrication Works and other applicable locations to allow thorough meaningful inspections and obtaining of physical samples for testing. Free access shall include turning, lifting, moving and positioning of the Work or components to allow reasonable access for inspection.

D. In the event that the accuracy or adequacy of any Owner's inspection or tests is challenged by the Contractor for any reason and re-inspection or re-testing is performed, all costs for each specific instance or re-inspection or re-testing shall be paid by the Contractor or other party challenging the original report. Results of such inspections or tests will be accepted for consideration by the Owner only when performed by a Testing Laboratory or Consultant approved, in writing, by the Owner prior to the beginning of the subject re-tests or re-inspections.

E. All tests and Laboratory Inspection specified to be performed for the project shall be performed by the selected Testing Laboratory and the cost for services shall be paid by the Owner except where otherwise specified.

F. Testing Laboratory Qualifications:

1. ASTM E548-94: Guide for General Criteria Used for Evaluating Laboratory Competence.

2. ASTM E329: Specification agencies Engaged in the Testing and/or Inspection of Materials used in Construction.

3. ASTM D3740: Practice for minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

1.3 RESPONSIBILITIES

A. Testing Laboratories or Consultants will be properly equipped and qualified to perform the duties and tests for which they are hired.

B. Specialized testing such as acoustics will be performed by the Laboratory designated by the Owner.

C. The Contractor is not obligated to employ the Owner's Testing Laboratory for Contractor's tests or other services required as a part of the Work. The cost of Owner's review and evaluation of Contractor's tests by Owner's Testing Laboratory or Consultants will be paid by the Owner; all costs of other services performed by the Owner's Testing Laboratory or Consultants in the interest of the Contractor shall be paid by the Contractor.

D. Testing performed by the Owner's Testing Laboratory shall not act to relieve the Contractor from his responsibility to provide all testing laboratory services called for in this Section or under individual Trade

E. Measurements and surveys performed by the Testing Laboratory shall be under the supervision of a surveyor licensed to practice in the State of Michigan.

1.4 OTHER MATERIALS TO BE TESTED

A. When so instructed by the Owner, or the Architect, the Contractor shall deliver samples and materials to Owner's Testing Laboratory so that independent tests can be made to determine compliance with the requirements of the Specifications.

B. When instructed by the Owner or the Architect, the Contractor shall take samples form materials being installed at the job site and deliver these to locations as directed. Samples shall be selected at random by Testing Laboratory, or Consultant, from material being applied or installed.

C. Samples of various materials or equipment delivered on the site or in place may be taken by the Owner for testing. Samples failing to meet Contract requirements will automatically void previous approvals of items tested. The Contractor shall replace such materials or equipment found not to have met Contract requirements, unless a proper adjustment of the Contract price is made and is accepted by the Owner.

1.5 MISCELLANEOUS TESTING SERVICES

A. The following Laboratory Testing and Inspection Services will be performed during the course of the work. The Contractor shall provide support services and cooperation as specified.

B. Earthwork:

1. Fill and backfill will be tested for specified consolidation of materials.

2. Coordinate Work and cooperate with Soils Inspector and Testing Laboratory to permit compacting tests as described in "Earthwork" Section of Division 2, as each layer of material is placed.

C. Special Foundations: None required.

D. Concrete Testing:

1. Concrete testing shall be as specified herein and under other sections as referenced.

2. The Contractor shall provide necessary site labor to assist in taking and preparing job samples; coordinated with the Testing Laboratory for scheduling, testing and inspection; submit samples of materials for concrete, admixtures, and cement to the Laboratory for testing.

3. Concrete testing will be required for all concrete work performed under individual Sections of Division 2, "Site Work," and Sections of Division 3, "Concrete" including all cast-in-place and pre-cast concrete used on the Project.

E. Reinforcing Steel Testing:

1. Inspect before and after setting in forms, prior to concrete placement.

2. Certify compliance with Contract Documents; do not check using shop drawings.

F. Steel Testing:

1. Reinforcing Steel: Tests as specified under Concrete and Masonry Sections Division 2, 3 and 4.

2. Structural Steel: As specified under Division 5.

3. Steel Joints: As specified under Division 5.

1.6 SOIL CONSULTANT

A. The Owner may, in its sole interest, employ and pay for the services of a Soils Consultants to observe the work and advise the Owner concerning activities in connection with the performance of excavation and foundation work.

B. Obtain Consultant's approval for construction schedule and sequence of operations.

C. Discontinue any practice immediately when notified, that in the Consultant's opinion, it is not in accordance with the intent of the Specification or will act to the detriment of the system. All work affected by the practice will be subject to complete replacement.

D. See applicable Trade Sections for procedures.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 SOILS TESTING AND INSPECTION

A. Materials Testing:

1. Test soil materials proposed for use in the work and promptly submit test result reports of:

a. Test reports on borrow material.
b. Field density test reports.
c. One optimum moisture-maximum density curve for each type of soil encountered.
d. Other tests and materials certificates as required.

2. Provide one optimum moisture-maximum density curve for each type of soil encountered in subgrade and fills. Determine maximum densities in accordance with ASTM D 1557.

3. Analyze material within 3 feet of finished grades of paved areas to determine content of chemicals deleterious to concrete.

4. The testing service will determine the suitability of materials to be used as fill.

5. For borrow materials, perform a mechanical analysis (AASHTO T88), plasticity index (AASHTO T91), moisture-density curve AASHTO T180 or ASTM D 1557), and chemical analysis.

B. Testing During Construction:

1. Testing service shall inspect and approve subgrades and fill layers before further construction work is performed thereon. Perform field density tests in accordance with ASTM D 1556 (sand cone method) or ASTM D2167 (rubber balloon method).

2. Make at least one field density test of the subgrade for every 2000 sq. feet of paved area, but in no case less than 3 tests.

3. In each compacted fill layer, make one field density test for every 2000 sq. feet of overlaying paved area, but in no case less than 3 tests.

4. If, in the opinion of the Architect, based on reports of the testing service and inspection, the subgrade or fills which have been placed are below the specified density, additional compacting and testing will be required until satisfactory results are obtained.

5. The results of density tests of soil-in-place will be considered satisfactory if the average of any 4 consecutive density tests which may be selected are in each instance equal to or greater than the specified density, and if not more than 1 density test out of 5 has a value more than 2% below the required density.

6. Perform soil load bearing test, "Repetitive Static Load Tests of Soils and Flexible Pavement Components for use in Evaluation and Design of Airport and Highway Pavements", in accordance with ASTM D1195.

3.2 BITUMINOUS CONCRETE TESTING AND INSPECTION

A. Secure samples of all bituminous concrete materials proposed by Contractor for evaluation and testing.

B. Review paving designs proposed by the Contractor as specified in "Bituminous Paving" Section.

C. During the course of the work, perform the following inspections and tests and furnish the Architect and the Owner with certified reports of each inspection or test:

D. Test Method: Meet requirements of the State of Michigan Department of Transportation and the local jurisdictional authorities.

3.3 CONCRETE TESTING AND INSPECTION

A. Secure samples of all concrete materials proposed by Contractor for evaluation and testing.

B. Conduct tests of materials and mixes to substantiate that they perform as specified and submit certified reports of same to the Architect.

C. During the course of the work, perform the following inspections and tests and furnish the Architect and the Owner with certified reports of each inspection or test:

1. Inspect operations, equipment and materials at concrete plant for conformance with the Contract Documents.

2. Sample concrete for test cylinders in accordance with ASTM D 172.

3. Mold test cylinders in accordance with ASTM C31 in the numbers specified herein.

4. Perform slump tests in accordance with ASTM C143. Make one representative test for each batch of concrete and at least one test per hour during a continuous concrete pour.

5. Make air-entrainment tests on air entrained concrete with sufficient frequency to accurately control the air content.

6. Job-site cure test cylinders in accord with ASTM C31.

7. Transport test cylinders to Testing Laboratory.

8. Cure test cylinders in accordance with ASTM C39.

9. Make compressive strength tests in accordance with ASTM C39.

D. Test Cylinders: Mold, cure, and test cylinders as follows:

1. For cast-in-place concrete using Type I or II cement:

a. Each day's pour for each strength of concrete: Make 4 minimum.

E. Materials Test:

1. Cement: Conform to physical requirements of ASTM C150 for each carload or part thereof. Mill test certificates will generally be satisfactory verification.

2. Fine Aggregate: Field tests for organic matter (by color) silt (by decantation), sieve analysis, and laboratory tests of mortar tensile strength each day or change of source.

3. Course Aggregate: Sieve analysis each day or change of material.

F. Reports: Furnish two copies of all test and inspection reports to the Architect. Verify that concrete delivered to the job consists of material tested and that placement and testing of the delivered concrete conforms to these Specifications.

G. The Owner and the Architect reserve the right to perform inspection and tests during the progress of the work. These additional inspections and tests will be in addition to, and will not replace or remove, the requirements for tests and inspections specified herein.

3.4 MORTAR AND GROUT TESTING

A. General: Provide all inspection and tests specified in ASTM C 780 Annex through A7.

B. Inspection and Tests:

1. Mortar and Grout at structural bearing and reinforced walls only: Make 3 cylinders for each week’s work for each type of mortar, and grout. Make a minimum of 3 cylinders for each change of material, mortar, cement aggregate or mix.

2. Test cylinders at the following ages: For concrete made with Type II cement, one at 7 days, two at 28 days.

3. Provide complete evaluation in accordance with ASTM C78 Annex A8 for design mix and at each change of materials thereafter.

3.5 STRUCTURAL STEEL TESTING AND INSPECTION

A. Where material identity is maintained and readily demonstrable, certified mail test certificates will be acceptable. Material not satisfactorily and clearly traceable to an acceptable mill test certificate shall not be used in the Work. The Testing Laboratory shall verify conformance of all structural steel materials.

B. Conduct tests of materials and assemblies to substantiate that they perform as specified and submit certified reports of same to the Owner and the Architect.

C. Tests for Welding and Bolting: The Testing Laboratory shall test all shop and field welding and inspect all high strength bolting. The Laboratory shall furnish Inspectors approved by the Owner and shall be registered in, and shall comply with, all regulations of the Department of Building and Safety of the Local Governing Authority and shall certify in writing, upon completion of the work, that the welding and high strength bolting have been performed in accordance with the Drawings and Specifications and all codes and ordinances.

3.6 MECHANICAL AND ELECTRICAL TRADES

A. Tests performed by the Owner's Testing Laboratory for Mechanical and Electrical Trades shall include materials testing only.

B. Balancing, testing, and other checking required to verify proper performance of systems shall be by the Contractor as specified.

END OF SECTION

ABBREVIATIONS

PART 1 - GENERAL

1.1 The following is a list of abbreviations utilized throughout the Contract Documents.

A		B		C	
ABV.	Above	B/B	Back-to-Back	CAB.	Cabinet
A.F.F.	Above Finish Floor	B.F.P.	Back Flow Preventer	C.U.H.	Cabinet Unit Heater
ABR.	Abrasive	B.D.D.	Back Draft Damper	CAP.	Capacity
ABS.	Absorbing	B.F.	Barrier Free	CPT.	Carpet
ACC.	Access	B.B.R.	Base Board Radiation	CSMT.	Casement
A.C.C.	Air Cooled Condenser	B.PL.	Base Plate	CSWRK.	Casework
ACC.PNL.	Access Panel	BSMT.	Basement	CSG.	Casing
A.V.	Acid Vent	B.	Bath Room	C.I.	Cast Iron
A.W.	Acid Waste	BM.	Beam	C.I.F.	Cast Iron Frame
AC.	Acoustic/Acoustical	BRG	Bearing	C.I.P.	Cast Iron Pipe
AC.T.	Acoustic Tile	BR.	Bedroom	CSTG.	Casting
AC.INSUL.	Acoustical Insulation	B.M.	Bench Mark	CAT.NO.	Catalog Number
A.D.A.	Americans with Disability Act.	BT.	Bent	C.B.	Catch Basin
ADD.	Addendum	BETW.	Between	CLG.	Ceiling
ADDN.	Addition	BEV.	Bevel	C.D.	Ceiling Diffuser
ADDNL.	Additional	BIT.	Bituminous	CLG.HT.	Ceiling Height
ADH.	Adhesive	B.I.	Black-iron	CEM.	Cement
ADJ.	Adjacent/ Adjustable	BLK.	Block	CEM.PLAS.	Cement Plaster
AGGR.	Aggregate	BD.	Board	CTR.	Center
A.C.B.	Air Circuit Breaker	BLR.	Boiler	C.L.	Center Line
A/C	Air Conditioning	BLR.F.	Boiler Feed	C/C	Center-to-Center
A.C.	Air Conditioner	BLR.H.	Boiler House	CER.	Ceramic
A.C.C.	Air Conditioning Compressor	B.S.	Both Side	CER.T.	Ceramic Tile
A.C.U.	Air Conditioning Unit	B.W.	Both Ways	CBD.	Chalkboard
A.H.U.	Air Handling Unit	BOT.	Bottom	CHAM.	Chamfer
ALT.	Alternate	B.O.D.	Bottom of Duct	CHG.	Change
ALUM./AL.	Aluminum	B.O.P.	Bottom of Pipe	C/CHAN.	Channel
AMT.	Amount	BOT.EL.	Bottom Elevation	CHKD. PL.	Checkered Plate
AMP.	Amphere	BLVD.	Boulevard	CH.W.R.	Chilled Water Return
AMPL.	Amplifier	BDRY.	Boundry	CH.W.S.	Chilled Water Supply
ANCH.	Anchor/Anchorage	BRKT.	Bracket	CHD.	Chord
A.B.	Anchor Bolt	B.HP.	Brake Horsepower	CIRCUM.	Circumference
&	And	BR.	Brass	CIR.	Circle/Circular
L/AN.	Angleg	BRKR.	Breaker	CIRC.	Circuit
ANOD.	Anodized	BRK.	Brick	CIRC.	Circulation
APT.	Apartment	B.T.U.	British Thermal Unit	C.BR.	Circuit Breaker
APR.	Approved	BRZ.	Bronze	C-	Civil Drawing Number
APPR.	Approximate	BLDG.	Building	CL.	Class
ARCH.	Architect Architectural	B.L.	Building Line	CLRM.	Classroom
A-	Architectural Drawing Number	B.M.S.	Building Management System	C.O.	Clean Out
A.T.	Ash Tray	B.U.R.	Built-up Roofing	CLR.	Clear
ASPH.	Asphalt	BN.	Bullnose	CLR. GL.	Clear Glass
ASSY.	Assembly	BLKHD.	Bulkhead	CLR. W.GL.	Clear Wire Glass
@	At	BULL.	Bulletin	COEF.	Coefficient
AUTO.	Automatic	B.A.	Burglar Alarm	C.W.	Cold Water
A.S.R.	Automatic Sprinkler Riser	BUZZ.	Buzzer	COL.	Column
AUX.	Auxiliary			CO.	Company
AVG.	Average			COMPT.	Compartment
				COMPO.	Composition
				C.A.	Compressed Air
				COMPR.	Compressor
				CONC.	Concrete
				C.M.U.	Concrete Masonry Unit

C.W.R.	Condensing Water Return
C.W.S.	Condensing Water Supply
COND.	Condensate
COND.	Conduit
CONF.	Conference
CONN.	Connect
C.A.V.	Constant Air Volume
CONST.	Construction
C.J.	Control Joint
CONT.	Continue/Continuous
CONTR.	Contractor
C.P.	Control Panel
CONV.	Convector
CNVYR.	Conveyor
COR.	Corner
C.G.	Corner Guard
CORR.	Corridor/Corrugated
CPR.	Copper
CNTR.	Counter
CTSK.	Countersink/ Countersunk
CRS.	Course
COV.	Cover
COV.PL.	Cover Plate
C.C.T.	Cubical Curtain Track
CU.FT.	Cubic Feet/Cubic Foot
C.F.M.	Cubic Feet Per Minute
C.Y.	Cubic Yard
CULV.	Culvert
C.D.	Cup Dispenser
CYL.	Cylinder
CYC.	Cycles

D

DMPR.	Damper
DMPFG.	Dampproofing
D.L.	Dead Load
DB.	Decibel
D.	Deep
DEG.	Degree
DMT. PARTN.	Demountable Partition
DEPT.	Department
DEPR.	Depressed
DES.	Design
DET.	Detail
D.E.CO.	Detroit Edison Co.
DIAG.	Diagonal
DGM.	Diagram
DIA.	Diameter
DIFF.	Diffuser
DIM.	Dimension
D.R.	Dining Room
DIR.	Directory
D.D.C.	Direct Digital Control
DISC.	Disconnect
DISCONT.	Discontinuous
DW.	Dishwasher
DISP.	Dispenser
DIST.	Distance
D.P.	Distribution Panel
DO.	Ditto
DIV.	Divider/Division
DR.	Door
D.O.	Door Opening
DR.OP.	Door Operator
DBL.	Double
D.A.	Double Acting
D.H.	Double Hung
DWL.	Dowel
DN.	Down
D.S.	Downspout
D.S.B.	Downspout Boot
DRN.	Drain
D.T.	Drain Tile
D.T.C.	Drain Tile Connector
DWR.	Drawer
DWG.	Drawing
D.F.	Drinking Fountain
D.B.	Dry Bulb
D.S.P.	Dry Stand Pipe
DBWTR.	Dumbwaiter
DUP.	Duplicate
D.DR.	Dutch Door

E

EA.	Each
E.F.	Each Face
E.W.	Each Way
E	East
ELAST.	Elastomeric
FLASH.	Flashing
ELAST W.P.	Elastomeric Waterproofing
E.S.R.	Elastomeric Sheet Roofing
E.D.H.	Electric Duct Heater
ELEC.	Electric/Electrical
ELEC. CL.	Electric Closet
ELEC.CAB.	Electrical Cabinet
E.C.	Electrical Contractor
E-	Electrical Drawing Number
E.P.	Electrical Panel
E.R.P.	Electric Radiant Panel
E.U.H.	Electric Unit Heater
EWC	Electric Water Cooler
E.W.H.	Electric Water Heater
ELEC.OPER.	Electrically Operated
EL.	Elevation
ELEV.	Elevator
EMERG.	Emergency
ENCL.	Enclosure
ENGR.	Engineer
E/E	End-to-End
E.A.T.	Entering Air Temperature
ENTR.	Entrance/Entry
EP.	Epoxy
EQ.	Equal
EQUIP.	Equipment
EQUIV.	Equivalent
ESC.	Escalator
EST.	Estimate
EXC.	Excavated
EXH.	Exhaust
E.D.	Exhaust Duct
E.F.	Exhaust Fan
E.G.	Exhaust Grille
E.R.	Exhaust Register
EXIST.	Existing
EXP.	Expansion
EXP.B.	Expansion Bolt
E.J.	Expansion Joint
EXPL.P.	Explosion Proof
EXP'D.	Exposed
EXT'N.	Extension
EXT.	Exterior
E.H.	Extra Heavy
EXTR.	Extruded
E.S.P.	External Static Pressure

F

FAB.	Fabricated/Fabric
F/F	Face-to-face
F. FIN.	Factory Finish
F.C.U.	Fan Coil Unit
F.S.	Far Side
FAS.	Fastener
FDR.	Feeder
FT.	Feet/Foot
F.P.M.	Feet Per Minute
FN.	Fence
FBD.	Fiberboard
FIG.	Figure
FIN.	Finish/Finished
FIN.FLR/ F.F.	Finish Floor
F.T.R.	Finned Tube Radiation
F.A.	Fire Alarm
F.A.C.P.	Fire Alarm Control Panel
F. BRK.	Fire Brick
F.D.	Fire Damper
F.E.	Fire Extinguisher
F.E.C.	Fire Extinguisher Cabinet
F.H.C.	Fire Hose Cabinet
F.H.	Fire Hydrant
F.L.	Fire Line
F.R.	Fire Retardant/ Fire Rated

F.V.C.	Fire Valve Cabinet
FP.	Fireplace
FPRFG.	Fireproofing
FIXT.	Fixture
FLG.	Flange
FLASH.	Flashing
F.H.M.S.	Flat Head Machine Screw
F.H.W.S.	Flat Head Wood Screw
F.C.	Flexible Connection
FLR.	Floor
F.CO.	Floor Cleanout
F.D.	Floor Drain
FLR.FIN.	Floor Finish
FLUOR.	Fluorescent
FLDG.	Folding
FTG.	Footing
FMBD.	Formboard
FDN.	Foundation
FR.	Frame
FRMG.	Framing
F.A.I.	Fresh Air Intake
FRZR.	Freezer
F.L.A.	Full Load Amperes
F.S.	Full Size
FURN.	Furnish/ Furnished

G

GA.	Gauge
GAL.	Gallon
G.P.H.	Gallons Per Hour
G.P.M.	Gallons Per Minute
GALV.	Galvanized
GALV.I.	Galvanized Iron
G.	Gas
GKT.	Gasket
G.V. & B.	Gate Valve And Box
GA.	Gauge
GEN'L.	General
GL.	Glass
GLZ.	Glazing
G.H.T.	Glazed Hollow Tile
G.B.	Grab Bar
GR.	Grade/Grille
GB	Grade Beam
GRAT.	Grating
G.L.	Grid Line
GRN.	Granite
G.S.	Grease Separator
G.T.	Grease Trap
GND.	Ground
G.F.	Ground Fault
GT.	Grout
GYP.	Gypsum
GYP.BD.	Gypsum Board

H

HNDCP.	Handicapped
H.R.	Handrail
H.BD.	Hardboard
HDWE.	Hardware
HDWD.	Hardwood
HD.	Head
HDR.	Header
H.O.A.	Hands-Off-Auto
HD.	Head
H.A.GL.	Heat Absorbing Glass
H.R.U.	Heat Recovery Unit
HTR.	Heater
HTG.	Heating
H/V	Heating And Ventilating
H.V.A.C.	Heating, Ventilating, and Air Conditioning
H.H.W.R.	Heating Hot Water Return
H.H.W.S.	Heating Hot Water Supply
HGT.	Height
HEX.	Hexagon
H.	High
H.I.D.	High Intensity Discharge
H.P.	High Point
H.PR.	High Pressure
H.S.	High Strength
H.S.B.	High Strength Bolt
H.V.	High Voltage
HWY.	Highway
HSTWY.	Hoistway
H.C.	Hollow Core
H.M.	Hollow Metal
HK.	Hook
HORIZ.	Horizontal/ Horizontally
HP.	Horsepower
H.B.	Hose Bibb
H.S.P.	Hose Stand Pipe
H.V.C.	Hose Valve Cabinet
HOSP.	Hospital
H.W.	Hot Water
H.W.R.	Hot Water Return
H.W.S.	Hot Water Supply
HR.	Hour
H.O.	Hub Outlet
HYD.	Hydrant/Hydraulic
H.	Hydrogen

I

I.D.	Identification
INCAND.	Incandescent
IN. or "	Inch/ Inches
INCIN.	Incinerator
INCL.	Include/ Including
I.W.	Indirect Waste
INFO.	Information
I.D.	Inside Diameter
I.F.	Inside Face
INST'L.	Install/ Installation
INSUL.	Insulate/ Insulation
I.H.	Intake Hood
INT.	Interior
INTER.	Intermediate
INV.	Invert
I.E.	Invert Elevation

J

J.C.	Janitor Closet
JT.	Joint
JST.	Joist
J.B.	Junction Box
JR.	Junior

K

K.P.	Kick Plate
KV.	Kilovolt
KV.A.	Kilovolt Ampere
KW.	Kilowatt
K.	Kip (1000#)
KIT.	Kitchen
K.D.	Knock Down
K.O.P.	Knock-Out Panel

L

LBL.	Label
LAB.	Laboratory
LAD.	Ladder
L.B.	Lag Bolt
LAM.	Laminate/ Laminated
LDG.	Landing
L-	Landscape Drawing Number
LGE.	Large
LDRY.	Laundry
LAV.	Lavatory
L.A.T.	Leaving Air Temperature
L.H.	Left Hand
L.H.R.B.	Left Hand Reverse Bevel
LGTH.	Length
LEV.	Level
LIB.	Library
LT.	Light
LPRF.	Lightproof
LTG.	Lighting
L.P.	Lighting Panel
L.R.P.	Lighting Receptacle Panel
LTWT.	Lightweight

LTWT. CONC.	Lightweight Concrete
LMS.	Limestone
LTL.	Lintel
L.D.	Linear Diffuser
L.C.D.	Linear Ceiling Diffuser
L.F.	Linear Feet/Foot
LIQ.	Liquid
L.L.	Live Load
L.R.	Living Room
LOC.	Location
LKR.	Locker
LG.	Long
L.L.H.	Long Leg Horizontal
L.L.V.	Long Leg Vertical
LVR.	Louver
L.O.	Louver Opening
L.P.	Low Point
L.PR.	Low Pressure
LBR.	Lumber
LBS.	Pounds

M

MACH.	Machine
M.B.	Machine Bolt
MACH.RM.	Machine Room
M.U.A.	Make-Up Air
M.A.U.	Make-up Air Unit
M.D.P.	Main Distribution Panel
M.S.B.	Main Switch Board
MAINT.	Maintenance
MH.	Manhole
M.V.D.	Manual Volume Damper
MFR.	Manufacturer
MAR.	Marble
MK.	Mark
MAS.	Masonry
M.O.	Masonry Opening
MATL.	Material
MAX.	Maximum
MECH.	Mechanical
M-	Mechanical Drawing Number
M.C.	Medicine Cabinet
MED.	Medium
MEMB.	Membrane
MET.	Metal/ Metallic
M.C.S.	Metal Carpet Strip
M.D.S.	Metal Divider Strip
M.E.S.	Metal Edge Strip
M.L.	Metal Lath
M.L.& PLAS.	Metal Lath And Plaster
MET.W.P.	Metallic Waterproofing
MEZZ.	Mezzanine
M.D.O.T.	Michigan Department of Transportation
MWK.	Millwork
MIN.	Minimum
MIR.	Mirror
M. & S.	Mirror And Shelf
MISC.	Miscellaneous
M.I.	Miscellaneous Iron
MOD.	Model
MON.	Monument
M.S.& S.	Mop Strip And Shelf
M.O.	Motor Operated
M.O.D.	Motor Operated Damper
MLDG.	Molding
MTD.	Mounted
MTG.	Meeting/Mounting
MTD.	Mounted
MOV.	Moveable
MOV. PARTN.	Moveable Partition
MULL.	Mullion
M	Thousand
MBH	1000BTU/Hour

N

NAT.	Natural
N.S.	Near Side
NK.	Neck
NEUT.	Neutral
N.R.C.	Noise Reduction Coefficient
NOM.	Nominal
N.C.	Non-Corrosive
NOR.	Normal
N.C.	Normally Closed
N.O.	Normally Open
N	North
NOS.	Nosing
N.I.C.	Not In Contract
N.T.S.	Not To Scale
NO. or #	Number

O

OBS.	Obscure
OBS.GL.	Obscure Glass
OFF.	Office
O.C.	On Center
OPQ.	Opaque
OPG.	Opening
OPER.	Operator
O.B.V.D.	Opposed Blade Volume Damper
OPP.	Opposite
OPP.HD	Opposite Hand
ORIG.	Original
ORN.	Ornamental
OZ.	Ounce
O/O	Out-to-Out
O.A.	Outside Air
O.D.	Outside Diameter
O.F.	Outside Face
O.H.S.	Oval Head Screw
OA.	Overall
OHD.	Overhead
OHD.DR.	Overhead Door
OXY.	Oxygen

P

PRD.	Painted
PR.	Pair
PNL.	Panel
P.T.D.	Paper Towel Dispenser
P.T.W.R.	Paper Towel Waste Receptacle
PARA.	Paragraph
PRL.	Parallel
PGK.	Parking
P.BD.	Particle Board
PRTN.	Partition
PASS.	Passage
PAT.	Patent
PVMT.	Pavement
PVG.	Paving
PED.	Pedestal
PERF.	Perforated
PERIM.	Perimeter
PERM.	Permanent
PERP.	Perpendicular
PHOTO.	Photograph
P.H.	Physically Handicapped
PC.	Piece
PCS.	Pieces
PLAS.	Plaster
PL.LAM.	Plastic Laminate
PL.	Plate
PL.GL.	Plate Glass
PLAT.	Platform
PLBG.	Plumbing
PLYWD.	Plywood
PT.	Point
P.T.	Point of Tangency
P.C.	Point of Curvature
POL.	Polish/ Polished
PVC.	Polyvinylchloride
PORC.	Porcelain
PORC. ENAM.	Porcelain Enamel
POR.	Porous
PORT.	Portable
POS.	Position
P.I.V.	Post Indicator Valve
LBS. or #	Pounds
P.L.F.	Pounds Per Linear Foot

P.S.F.	Pounds Per Square Foot
P.S.I.	Pounds Per Square Inch
P.C.F.	Pounds Per Cubic Foot
P.P.	Power Panel
P/C	Precast
P.T.C.	Precast Terrazzo Receptor
PREFAB.	Prefabricated
PFN.	Prefinished
P.C.T./C.M.	Pressure Control Terminal/Control Module
P.G.	Pressure Gauge
P.R.G.	Pressure Relief Grille
P.R.V.	Pressure Reducing Valve
PRIM.	Primary
PROJ.	Project/ Projection
PROP.	Property/ Proposed
P.L.	Property Line
P.A.	Public Address
P.S.	Purse Shelf
P.B.	Push Button

Q

QTY.	Quantity
Q.T.	Quarry Tile
QTR.	Quarter
QTR.RD.	Quarter Round

R

RBT.	Rabbet
R.C.P.	Radiant Ceiling Panel
RAD. or R.	Radius
R.W.C.	Rain Water Conductor
R.R.	Railroad
RECV.	Receive/ Receiving
RECPT.	Receptacle
R.P.	Receptacle Panel
REC.	Recess
RECIRC.	Recirculation
RECT.	Rectangle / Rectangular
RED.	Reducer
RWD.	Redwood
REF.	Refer/Reference
REFL.	Reflected/Reflective
REFRIG.	Refrigerant
REFR.	Refrigerator
REG.	Register
RH.C.	Reheat Coil
REINF.	Reinforce/Reinforcing Reinforcement
R.H.	Relief Hood
REM.	Remove/ Removable
REP.	Repair
REQ'D.	Required
RESIL.	Resilient
RET.	Return
R.A.	Return Air
R.A.D.	Return Air Duct
R.A.F.	Return Air Fan
REV.	Revised/Revision
R.P.M.	Revolutions Per Minute
R.	Riser
R.H.	Right Hand
R.H.R.B.	Right Hand Reverse Bevel
R.O.W.	Right Of Way
RVT.	Rivet
RD.	Road
R.S.C.	Rolling Steel Curtain
RF.	Roof
R.C.	Roof Conductor
R.D.	Roof Drain
RF.H.	Roof Hatch
R.T.U.	Roof Top Unit
R.S.	Roof Sump
R.V.	Roof Ventilator
RFG.	Roofing
R.W.C.	Rain Water Conductor
RM.	Room
R.O.	Rough Opening
RND. or O	Round
R.H.M.S.	Round Head Machine Screw
R.H.W.S.	Round Head Wood Screw
R.T.	Rubber Tile

S

SAN.	Sanitary
S.N.D.	Sanitary Napkin Dispenser
S.N.R.	Sanitary Napkin Receptacle
SCHED.	Schedule
SCN.	Screen
STG.	Seating
SECT.	Section
SERV.	Service
S.S.	Service Sink
SHTHG.	Sheathing
SHT.	Sheet
SHT.MET.	Sheet Metal
SH. & P.	Shelf And Pole
SHWR.	Shower
S.C.R.	Shower Curtain Rod
S.DR.	Shower Door
SW.	Sidewalk
SIM.	Similar
SGL.	Single
SK.	Sink
S.D.	Soap Dispenser
S.C.	Solid Core
S.T.C.	Sound Transmission Class
S	South
SP.	Space
SPR.	Spare
SPKR.	Speaker
SPEC.	Specifications
S.D.	Splitter Damper
SPRYD.	Sprayed
SPKLR.	Sprinkler
SQ.	Square
S.F.	Square Feet/ Square Foot
STAG.	Staggered
ST.STL	Stainless Steel
STD.	Standard
SP.	Standpipe
S.P.	Static Pressure
STA.	Station
STM.	Steam
STL.	Steel
STL.PL.	Steel Plate
STIFF.	Stiffener
STO.FR.	Storefront
STOR.	Storage
ST.	Storm
STR.	Straight
ST.	Street
STRUCT.	Structural Drawing Number
S.G.F.T.	Structural Glazed Facing Tile
S.STL.	Structural Steel
SS.D.	Subsoil Drain
SS.D.C.	Subsoil Drain Connection
SUB.	Substation
S.A.G.	Supply Air Grille
S.D.	Supply Diffuser/ Duct
SUBST.	Substitute
S.A.R.	Supply Air Register
S.F.	Supply Fan
S.A.	Supply Air
S.A.D.	Supply Air Diffuser
SUPP.	Support
SURF.	Surface/Surfacing
SUSP.	Suspend/Suspension
SW.	Switch
SWBD.	Switchboard
SWGR.	Switchgear
SYM.	Symbol/Symmetrical
SYS.	System

T

T.BD.	Tackboard
TAN.	Tangent
TECH.	Technical

TEL.	Telephone
TEL.CAB.	Telephone Cabinet
TV	Television
TV.M.	Television Monitor
TEMP.	Temperature
TEMP.GL.	Tempered Glass
T.W.	Tempered Water
T.U.	Terminal Unit
TERR.	Terrazzo
T.B.	Test Boring
T.	Thermostat
THK.	Thick/Thickness
T.S.	Thickened Slab
M (1000)	Thousand
K (KIP)	Thousand Pounds
THD.	Thread/Threaded
THRESH.	Threshold
THRU.	Through
T.	Tile
T./TOIL.	Toilet
T.P.D.	Toilet Paper Dispenser
T.P.H.	Toilet Paper Holder
T & G	Tongue And Groove
T & B	Top & Bottom
T/C	Top Of Cover/Curb
T/EL.	Top Elevation
T/F	Top Of Footing
T/M	Top Of Masonry
T/P	To Of Pavement
T/R	Top of Rail
T/R	Top of Rim
T/S	Top of Steel
T/W	Top of Wall
T.B.	Towel Bar
T.D.	Towel Dispenser
T.D. & W.R.	Towel Dispenser & Waste Receptacle
T.G.	Transfer Grille
TRFR.	Transformer
TRAN.	Transom
T	Tread
T.D.	Trench Drain
T.S.	Tube Section
T.V.	Turning Vane
T.T.	Twin Tee
TYP.	Typical

U

U.C.	Undercut
U.G.	Underground
U.L.	Underwriters' Laboratories, Inc.
ULT.	Ultimate
UNFIN.	Unfinished
U.H.	Unit Heater
U.SUB.	Unit Substation
U.V.	Unit Ventilator
U.S.G.S.	United States Geological Survey
U.O.N.	Unless Otherwise Noted
U.S.A.	Untempered Supply Air
UR.	Urinal

V

VAC.	Vacuum
V.B.	Vacuum Breaker
V.C.O.	Vacuum Cleaner Outlet
V.BARR.	Vapor Barrier
VAR.	Variable
V.A.V.	Variable Air Volume
VARN.	Varnish
VNR	Veneer
V. PLAS.	Veneer Plaster
V.	Vent
V.T.R	Vent Thru Roof
VENT.	Ventilate/ Ventilation
V.I.F.	Verify In Field
VS.	Versus
VERT.	Vertical/Vertically
VERT.C.	Vertical Curve
VEST.	Vestibule
V.I.	Vibration Isolator
VNY.	Vinyl
V.C.T.	Vinyl Composition Tile
VIN.FAB.	Vinyl Fabric
V.R.S.	Vinyl Reducer Strip
VIT.	Vitreous
V.C.P.	Vitrified Clay Pipe
VOL.	Volume
V.D.	Volume Damper
V	Volts

W

WAINS.	Wainscot
W.CAB.	Wall Cabinet
W.CO.	Wall Cleanout
W.H.	Wall Hydrant
W/W	Wall-to-wall
W.V.	Wall Vent
WHSE.	Warehouse
W.F.	Wash Fountain
W.	Waste/Watts
W & V	Waste And Vent
W.R.	Waste Receptacle
W.C.	Water Closet
W.G.	Water Gauge
W.H.	Water Heater
WP.	Waterproofing
W.P.	Weatherproof
W.STPG.	Weatherstripping
WT.	Weight
W.W.F	Welded Wire Fabric
W	West
W.B.	Wet Bulb
W.	Wide/Width
W-x-	Wide Flange Section
WT	Wide Flange Tee Section
W.O.	Window Opening
W.GL.	Wire Glass
W.M.	Wire Mesh
W/	With
W/O	Without
WD.	Wood
W.L.	Working Line
W.PT.	Working Point
W.I.	Wrought Iron

Y

YD.	Yard
Y.P.	Yield Point
Y.S.	Yield Strength
YR.	Year

Z

Z.C.	Zinc-Coated

STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Specified Herein: Standards and Definitions
Definitions
Specification Content
Quality Standard of the Industry

1.2 DEFINITIONS

A. Certain terms used in the Contract Documents are defined generally in this article. Definitions and explanations of this section are not necessarily either complete or exclusive, but are general for the work to extent not stated more explicitly in another provision of the Contract Documents.

B. Indicated: A cross-reference to details, notes or schedules on the drawings, to other paragraphs or schedules in the Specifications, and to similar means of recording requirements in the Contract Documents. Where terms such as "shown", "noted", "scheduled", and "specified" are used in lieu of "indicated", it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.

C. Furnish: Supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.

D. Install: Perform operations at project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing protecting, cleaning and similar operations, as applicable in each instance.

E. Provide: Furnish and install, complete and ready for intended use, as applicable in each instance.

F. Installer: The entity (person or firm) engaged by the Contractor or its subcontractor or sub-subcontractor for the performance of a particular unit of work at the project site, including installation, erection, application and similar required operations. It is a general requirement that such entities (Installers) be expert in operations they are engaged to perform.

1.3 FORMAT AND SPECIFICATION EXPLANATIONS

A. Specification Production: None of these explanations will be interpreted to modify substance of requirements. Portions of these Specifications have been produced by Architect's/Engineer's standard methods of editing master Specifications, and may contain minor deviations from traditional writing formats. Such deviations are a normal result of this production technique, and no other meaning will be implied or permitted.

B. Format Explanation: The format of principal portions of these Specifications can be described as follows; although other portions may not fully comply and no particular significance will be attached to such compliance or non-compliance:

1. Sections and Divisions: For convenience, basic unit of Specification text is a "section", each unit of which is named and numbered. These are organized into related families of sections, and various families of sections are organized into "divisions", which are recognized as the present industry-consensus on uniform organization and sequencing of Specifications. The section title is not intended to limit meaning or content of section, nor to be fully descriptive of requirements specified therein, nor to be an integral part of text.

2. Each section of specifications has been subdivided into 3 (or less) "parts" for uniformity and convenience (Part 1 - General, Part 2 - Products, and Part 3 - Execution). These do not limit the meaning of and are not an integral part of text which specifies requirements.

3. Imperative Language: Requirements expressed imperatively shall be performed by Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities which must be fulfilled indirectly by Contractor, or when so noted, by others.

4. Section Numbering: Used to facilitate cross-reference in Contract Documents. Sections are placed in Project Manual in numeric sequence; however, numbering sequence is not complete, and listing of sections at beginning of project Manual must be consulted to determine numbers and names of specification sections in the Contract Documents.

5. Page Numbering: Numbered independently for each section; recorded in listing of sections (Index or Table of Contents) in Project Manual. Section number is shown with page number at bottom or each page, to facilitate location of text in Project Manual.

1.4 SPECIFICATION CONTENT

A. Specifying Methods: The techniques or methods of specifying to record requirements varies throughout text, and may include "prescriptive", "open generic-descriptive", "compliance with standards", "performance", "proprietary", or a combination of these. The method used for specifying one unit of work has no bearing on requirements for another unit or work.

B. Overlapping and Conflicting Requirements: Where compliance with 2 or more industry standards or sets of requirements is specified, and overlapping of these different standards or requirements establishes different or conflicting minimums of levels of quality, most stringent requirement (which is generally recognized to be also most costly) is intended and will be enforced, unless specifically detailed language written into the Contract Documents (not by way of reference to an industry standard) clearly indicated that a less stringent requirement is to be fulfilled. Refer apparently equal but different requirements, and uncertainties as to which level of quality is more stringent, to Architect for a decision before proceeding.

1. Contractor's Options: Except for overlapping or conflicting requirements, where more than one set of requirements are specified for a particular unit of work, option is intended to be Contractor's regardless of whether specifically indicated as such.

C. Specified Quality Standards: The fact that a specified product or model number is in conflict with specified quality requirements such as "concealed fasteners" or "special colors" such specification shall be construed to mean that acceptance is contingent upon manufacturer or fabricator modifying the product to comply with the Specifications.

D. Minimum Quality/Quantity: In every instance, quality level or quantity shown or specified is intended as minimum for the work to be performed or provided. Except as otherwise specifically indicated, actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable limits. In complying with requirements, indicated numeric values are either minimums or maximums as noted or a appropriate for context of requirements. Refer instances of uncertainty to Architect for decision before proceeding.

E. Specialists; Assignments: In certain instances, specification text requires (or at least implies) that specific work be assigned to specialists or expert entities, who must be engaged for performance of those units of work. These must be recognized as special requirements over which Contractor has no choice or option. These assignments must not be confused with (and are not intended to interfere with) normal application of regulations, union jurisdictions and similar conventions. One purpose of such assignments is to establish which party or entity involved in a specific unit of work is recognized as "expert" for indicated construction processes or operations. Nevertheless, final responsibility for fulfillment or entire set of requirements remains with Contractor.

F. Abbreviations: The language or Specifications and other Contract Documents is of the abbreviated type in certain instances, and implies word and meanings which will be appropriately interpreted. Actual work abbreviations of a self-explanatory nature have been included in the text. Specific abbreviations have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of Specification requirements with notations on drawings and in schedules. These are frequently defined in sections at first instance of use. Trade association names and titles of general standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of the Contract Documents so indicates.

1.5 QUALITY STANDARDS OF THE INDUSTRY

A. General Applicability of Standards: Applicable standards of construction industry have same force and effect (and are made a part of Contract Documents by reference) as if copied directly into Contract Documents, or as if published copies were bound herewith.

1. Reference standards (referenced directly in Contract Documents or by governing regulations) have precedence over non-referenced standards.

2. Non-referenced standards have no particular applicability except as a measure of compliance with standards recognized in construction industry.

B. Copies of Standards:

1. Where copies of standards are needed for proper performance of the work, the Contractor is required to obtain such copies directly from the publication source.

2. The Architect reserves the right to reasonably require the Contractor to submit, or maintain at the jobsite, copies of all applicable standards as needed for enforcement of the requirements.

C. Publication Dates: Except as otherwise indicated, where compliance with an industry standard is required, comply with standard in effect as of date of Contract Documents.

D. Abbreviations and Names: Acronyms or abbreviations used in Contract Documents mean the industry recognized name applicable to context of text provision.

1.6 DRAWINGS, DETAILS, SCHEDULES

A. Large scale details are provided to show arrangement, attachment, and otherwise indicate relationships of component materials and for purposes of clarify often do not show all materials. The fact that a material is, or is not indicated on such details shall not act to relieve the Contractor of responsibility for providing a specified item.

B. Schedules are provided for convenience of reference only. In the event of an omission or conflict between schedules and other documents, the more restrictive document shall govern as directed by the Architect.

1.7 CODES AND STANDARDS

A. Comply with latest revisions to date of all Governing Codes and with all other legal provisions relating to the Work. Other standards and references shall be current edition as of date of issue of Bidding Documents.

B. Conform to all laws, ordinances and regulations affecting the erection, sequence of erection, and completion of the whole or any part of the work; and conform to the requirements of the Owner and of public authorities having lawful or customary jurisdiction.

C. These requirements shall take precedence over the Contract Documents except where the Contract Documents require higher standards also acceptable to the authorities.

1.8 PERMITS, CODES, ORDINANCES AND NOTICES

A. See General Conditions for permits.

B. Obtain and keep available at the job, copy of building ordinances pertinent to the work.

C. Inform the Owner and the Architect, in writing, of the manner and time in which each of the requirements of the General Conditions concerning permits are complied with.

D. Make all necessary arrangements and obtain permits for blockage of streets and for all interference with the public right of way.

E. Special Inspections: All special inspections required to be made under provisions by building code of utility company regulations shall be arranged and paid for by the Contractor whose work requires such inspection.

END OF SECTION

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. DRAWINGS AND GENERAL PROVISIONS of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

1.2 SUBMITTALS

A. Substitution Request Submittal: Requests for substitution will be considered if presented to the Architect at least 10 days in advance of bid due date.

1. Identify the product, or the fabrication to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:

    a. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
    b. Samples, where applicable or requested.
    c. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
    d. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors that will become necessary to accommodate the proposed substitution.
    e. A Statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
    f. Cost information, including all related costs under this Contract and excluding Architect's redesign costs, net change, if any, in the Contract Sum, and waiving all claims for additional costs related to the substitution which subsequently became apparent.
    g. Certification by the Contractor that the substitution proposed is appropriate in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.

B. Product Presentation: Conduct a presentation at the Architect's office if required by the Architect to prove appropriateness to the specified product.

C. Architect's Action: Within one (1) week of receipt of Bids, the Architect may request additional information or documentation necessary for evaluation of the request. Within two (2) weeks of receipt of the request, or one (1) week of receipt of the additional information or documentation, which ever is later, the Architect will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute is not made or obtained within the time allocated, use the product specified by name. If acceptance is made prior to award, it will be included in the Contract Amount. If acceptance is made after Award, it will be in the form of a Change Order.

1.3 GENERAL REQUIREMENTS FOR SUBSTITUTIONS

A. Substitutions During Bidding:

1. Substitutions shall be included in the proposal under the following conditions only and shall follow all requirements of "Acceptance of Substitutions."

a. When the Contractor is unable to obtain competitive prices from more than one of the specified manufacturers.
b. When the Contractor knows of another product of equal or better quality and performance.
c. When the Contractor has had unsatisfactory experience with one or more of the specified products or has reason to believe that the specified Manufacturer will not provide the necessary guarantees or assume responsibility for performance.

B. Substitutions After Contract:

1. Substitutions proposed after Award of the contract will only be considered for the following reasons.

2. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.

C. Acceptance of Substitutions:

1. Substitutions will be considered for any manufacturer except those followed by the words "No Substitutions" in the Specifications.

2. In all cases where substitutions are proposed by the Contractor, it shall be the sole responsibility of the Contractor to provide adequate data and samples as required by the Architect to evaluate the substitution.

3. The Architect shall not be obliged to justify his reason for rejecting a proposed substitution.

4. In the event that a substitution is accepted conditionally on the Contractor's agreement to assume full responsibility for equality and performance, the Contract shall provide a full value warranty and agree to make good all damages resulting from the failure of the substitute product.

1.4 ACCEPTANCE OF MATERIALS AND MANUFACTURERS

A. Standard Materials:

1. Architect's acceptance applies to the Manufacturer only and shall not act to permit any deviation from other requirements of the Specifications.

2. Acceptance will be based on the Manufacturer's specifications at time of issuance of Bidding Documents. Deviations from such specifications shall be considered as a substitution.

3. Requests for acceptance shall be in tabular form stating Specification paragraph and material selected, except as otherwise provided.

4. Shop Drawings shall not indicate any material for which acceptance has not been received, unless accompanied by a separate request for approval. In no case shall Architect's review and return of Shop Drawings constitute and acceptance of either specified or substitute manufacturers or materials.

B. Materials Involving Supplementary Warranty of Maintenance Contract:

1. These materials shall be submitted as a request for acceptance over the signature of a qualified technical representative in the direct employ of the Manufacturer of such other person as the manufacturer may authorize in writing. Request for acceptance shall contain the following information.

   a. Name of project.
   b. Name of Contractor, Subcontractor or other party to whom material is furnished.
   c. Reference to Specification Section and Article where material is specified and other Contract Documents necessary for identification.
   d. Statement of acceptance of documents, conditions, and performance requirements:

      1) Statement that documents as issued are in accordance with manufacturer's recommendations for use of specified materials, or
      2) Recommended modification of detail, use, application or for substitution of different product by same manufacturer as being more suitable for the performance requirements of the warranty.

   e. Statement that detailed installation instructions will be provided.
   f. Extent of job site technical services, consultants or instructors proposed, if any.
   g. Statement that warranty will be provided.
   h. Special provisions required to keep warranty in force.

2. Requests for acceptance may be in the form of a letter including the above items and addressed to the subcontractor responsible for installation of the material, or may be according to a sample form of Material Proposal, provided by the Architect.

3. Upon receipt of the manufacturer's proposal, the subcontractor shall add his own statement agreeing to comply with the manufacturer's requirements and warranting his own workmanship.

4. The Contractor shall submit letter of endorsement of copies of all documents, including letters of comment, to the Architect for approval. In the event that the request for approval recommends a change in the work, modification of detail, or substitution of material, the Contractor shall indicate his concurrence with the change as being within the scope of the Contract or indicate the change in the Contract Sum for making such change, or state his objections to the change.

END OF SECTION

EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Specified Herein: General Requirements for standards of construction operations and procedures of a repetitive or general nature.

1.2 MANUFACTURER'S REVIEW

A. Manufacturer's review of documents and conditions of use is a statement by the manufacturer or a representative or agent thereof that it has reviewed the documents pertaining to the work and verified the proposed use of the material including details and instructions for applications or installation, is suitable for the intended purpose, and under similar conditions of use.

B. Obtain and submit a statement from the manufacturer indicating that they have no objection to the proposed details or method of installation, and that instructions for applications or installation are in conformance with manufacturer's recommendations. Statement shall include any additional precautions or protective measures which should be taken.

C. Manufacturer's review shall recognize adjacent materials and state if there is, in its opinion, a serious question of compatibility including possibility of damage to other materials, or damage to the material or assembly by other materials. Such conditions shall be reconsidered and adjustments made, previous approvals notwithstanding.

1.3 APPROVED APPLICATOR

A. An approved applicator or installer is one whom the manufacturer has reason to believe is experienced and qualified in the work and is familiar with the product and with the manufacturer's recommendations for use and installation.

B. Obtain and submit a statement from the manufacturer that the proposed applicator or installer is approved and indicate whether or not this approval is subject to review and observation of the work by the manufacturer's representative.

C. Manufacturer shall not approve an installer or applicator if, because of past history of performance or other reasons, there is a reasonable doubt that it can be relied upon to perform in accordance with the Contract Documents.

D. Upon completion of the work, manufacturer shall certify that approved material in the proper quantities have been delivered to the approved applicator for use on the Project.

E. In the event that manufacturer declines to approve proposed applicator, submit a statement as to whether or not on-site instruction or manufacturer's supervision is recommended.

1.4 MATERIAL HANDLING, STORAGE AND DELIVERY

A. Where applicable, deliver all packaged materials to the site in manufacturer's original unopened containers.

B. Properly pack all materials in appropriate containers for shipment. Identify contents with piece marks referenced to shop drawings and as far as possible in some sequence as erection. Provide packing, wrapping and other protection as required to insure satisfactory condition of materials and finishes at time of erection.

C. Inspection and acceptance will be made on the basis of materials as delivered to the job site.

D. Provide adequate quantities to allow for damage and breakage during shipment and delivery and for replacement of all materials damaged prior to final acceptance. All such replacement of damaged materials shall be at no additional cost to the Owner.

E. Store materials and equipment which are subject to degradation by outside exposure in a weathertight enclosure.

1.5 MIXING, THINNING AND STORAGE

A. Store and mix paints only in areas designated, and provide proper protection for walls and floors.

B. Mix and thin paints in strict accordance with recommendations of the manufacturer.

C. Deliver and store paints and flammable materials in the manufacturer's original unopened containers, as far as practicable. Keep partially used materials in tightly closed containers.

D. Do not store oil or paint soaked rags inside the building. Do not store materials in any room containing a direct fired heating unit.

1.6 ON SITE INSTRUCTION

A. On-site instruction shall consist of inspection and instruction performed by a qualified representative of the manufacturer.

B. Obtain and submit a statement from the manufacturer that its authorized representative will provide the specified inspection and instruction and submit a record of the date on which specified services were provided.

C. Service shall consist of:

1. Preliminary inspection of substrates and all other conditions which would affect the performance of the work.

2. Give notice of all unacceptable conditions and recommend remedial action.

3. Recommend proper procedures for conditions as encountered at the site.

4. Verify that workers are qualified and have received proper instructions.

1.7 MANUFACTURER'S SUPERVISION

A. Manufacturer's supervision, in addition to all services specified for on- site instruction, consists of continuing inspection and verification that the work has been performed in accordance with the Contract.

B. Obtain and submit a statement from the manufacturer that complete supervision will be provided.

C. Where supervision is specified, all costs shall be included in the Base Bid. Where supervision is recommended as a modification, submit a proposal indicating the extent and additional cost, if any, of such service.

D. Upon completion submit a report giving dates of inspections and include pertinent information as applicable to the particular trade such a procedures, coats, coverages, tests as necessary to verify conformance and certify that the proper types and quantities of materials were installed.

1.8 WORKMANSHIP

A. Employ skilled mechanics and fabricate all work in the best and most workman-like manner and in strict accordance with the detail drawings, by fabricating contractors regularly engaged in the particular type or work.

B. Conform to the acceptable fabrication and erection standards of the manufacturer and to the applicable rulings of Code Authorities.

1.9 FABRICATION

A. Fabricate and install all items plumb, true, straight, square, level and in proper elevations, plane, locations and alignment with other work. Design all work for adjustment to field connection, fitted with proper joints and intersections, adequately anchored in place. Complete work in every detail.

B. Design and anchor work so that work will not be distorted not fasteners overstressed from expansion and contraction due to temperature change.

C. All fasteners for exposed surface where not otherwise indicated shall be concealed.

D. Fabricated Items:

1. Model numbers of Manufacturers as listed herein are intended to indicate design and detail for each item. Variations affecting function or appearance will not be accepted.

2. Identifying Markings: Where the manufacturer's name, patent number, model number or similar identifying marks are required, locate such markings in as inconspicuous as possible location. In no case will such marks be acceptable as part of the basic design.

3. Hardware for all Units: Concealed fasteners and hardware. Butt hinges are not acceptable as a substitute where item scheduled in Specification is manufactured with concealed pivots or piano hinges.

1.10 INSTALLATION

A. Accurately locate, carefully plumb and level, and securely attach all accessories.

B. Provide concealed grounds and backing or other anchorages devices, properly located, as required for fastening.

C. Use manufacturer's standard mounting devices as best suited to installation conditions and as accepted by the Architect. Make all attachments by positive mechanical fastening devices, except where other installation methods are indicated.

D. Where so recommended by the manufacturer, install the work under direct supervision of the authorized representative of the manufacturer. Employ workers experienced and qualified in the trade.

E. Install units true and plumb in the opening maintaining proper contact with frames or adjacent materials and fitting closely to detail at intersection with other materials to provide for proper operation.

F. Connect and properly adjust all operating devices and equipment to operate smoothly and perfectly.

G. Upon completion or when directed, conduct careful inspection and correct defective work. Perform necessary adjustments as required to leave the completed installation in efficiently operable condition.

1.11 PREPARATION OF SURFACES FOR COATINGS AND COVERINGS

A. Inspect all surfaces and verify that all required cants and chamfers are provided, and that all surfaces are free from irregularities of projections which would interfere with proper application.

B. Thoroughly clean surfaces; remove all loose materials, grease, oil and foreign matter.

C. Allow surfaces to completely dry before applying materials.

D. Report all unsatisfactory surface to contractor for correction before proceeding. Otherwise proceeding will constitute acceptance of surface by Contractor.

E. Note: Interior application of solvent type adhesives and systems require special ventilation or special solvents if ventilation is not possible.

1.12 BUILDING-IN, ANCHORS, INSERTS

A. Unless otherwise stipulated, each trade generally shall promptly furnish anchorage and insert devices, together with adequate setting information, where necessary for building into the work by other trades.

B. Verify the accuracy of all built-in anchors and inserts.

C. Delays and errors shall be corrected by the trade responsible therefor.

D. Power driven anchors of equivalent capacity and function may be accepted, subject to written acceptance, where approved by local jurisdictional authorities.

E. Do not endanger or alter the work of any other trade without obtaining prior written consent.

F. Furnish all supports necessary for proper installation of equipment.

END OF SECTION

FIELD ENGINEERING

PART 1 - GENERAL

1.1 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.

1.2 WORK INCLUDED

A. Provide and pay for field engineering services required including all survey work.

B. All survey work related to the project shall be completed by one (1) Surveyor.

1.3 QUALIFICATIONS

A. Registered Professional Surveyor, acceptable to Owner, Construction Manager and Engineer.

1.4 SURVEY REFERENCE POINTS

A. Locate and protect control points prior to starting site work, and preserve all permanent reference points during construction.

B. Make no changes or relocation without prior written notice to Owner's Representative, Construction Manager, and Engineer.

C. Report to Owner's Representative, Construction Manager, and Engineer when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

D. Require Surveyor to replace project control points which may be lost or destroyed.

1. Establish replacement control points based on original survey.

1.5 SURVEY/ EXISTING CONDITIONS PLAN

A. Survey documents provided are based on past survey work and historic drawings. Contractor shall field verify horizontal and vertical site conditions. Any discrepancies in documents shall be immediately reported to Owner's Representative, Construction Manager, and Engineer.

1.6 RECORDS

A. Maintain a complete, accurate log of all control and survey work as it progresses.

1.7 SUBMITTALS

A. Submit name and address of Surveyor to Construction Manager.

B. On request of Construction Manager, Owner's Representative or Engineer, submit documentation to verify accuracy of field engineering work.

C. Submit certificate signed by Registered Surveyor certifying that elevations and locations of improvements are in conformance, or non-conformance, with Contract Documents.

D. Provide “As-Built” drawings reflecting any changes to the existing survey.

E. Refer to drawings for survey requirements during construction.

PART 2 – PRODUCTS – Not Applicable

PART 3 – EXECUTION – Not Applicable

END OF SECTION

WARRANTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Specified Herein: Warranties and continuing services required to be provided by manufacturers of materials and systems where required for proper performance.

B. The word "Guarantee" when appearing in any Contract Document or construction correspondence shall be defined as warranty in accordance with Article 9.4 of the General Conditions.

1.2 SUBMITTALS

A. Submit warranties in accordance with Article 9.4 of the General Conditions as modified by Supplementary Conditions and additional requirements specified under the individual Trade Sections.

B. Required types of warranties and additional services are scheduled and listed in the Trade Sections.

C. In all cases where "Special Warranties" or "Service Contracts" are required, the request for approval of materials will be accepted by the Owner and the Architect on the understanding that manufacturer agrees to provide the specified warranty or other service unless stated otherwise in the request.

D. The Owner will not be bound to accept any limitations or variations from the specified warranty which were not filed with the request for acceptance and accepted prior to purchase of materials.

E. Warranties shall be submitted prior to request for payment for 100% completion in each case, shall acknowledge the responsibilities defined under Supplementary Conditions and shall include:

1. Manufacturer's warranty that all materials comply with its published standards, comply with the requirements of the Specifications and where specified, are adequate for the proposed use.

2. Subcontractor's warranty that all workmanship complies with the requirements of the Specifications and of the manufacturer

3. Contractor's warranty covering the entire work and accepting responsibility for all limitations imposed by the manufacturer or sub- contractor except where such limitations have been previously accepted by the Architect.

4. Certification and verification of previously submitted information including statement of all limitations, required maintenance and similar conditions of the warranty.

1.3 STANDARD WARRANTIES

A. A standard warranty is a warranty whose terms are essentially the same as normally offered by the manufacturer of standard with the industry.

B. General Conditions require that standard warranties apply as a minimum requirement notwithstanding the fact that submittal of a copy of the warranty is not required.

C. Unless otherwise specified a standard warranty shall be for a period on one (1) year from Date of Substantial Completion.

D. Contractor shall obtain and furnish to the Owner from each manufacturer of materials or equipment incorporated into the Work a warranty at least as favorable to Owner as that customarily given by such manufacturer to others. Contractor shall inform itself as to any conditions precedent to the effectiveness of each manufacturer's warranty and comply with all such conditions (or obtain waivers thereof from the manufacturer) so that such warranty shall be fully effective. If any event occurs which might invalidate any manufacturer's warranty, Contractor shall promptly notify the Owner and the Architect.

E. All warranty periods shall commence on the Date of Substantial Completion except that, if it is discovered after said date that certain work or materials were not in fact in conformance with the requirements of the Contract Documents, the applicable warranty period shall re-commence from the completion of the repair or replacement of such Work to make it so conform.

F. The fact that a manufacturer's warranty differs in its terms from those of the Contractor or any Subcontractor, the acceptance by the Owner of any warranty of a manufacturer or Subcontractor, or the fact that the Owner has claimed initially on such warranty, shall not in any way release Contractor from his warranty obligations under the Contract.

1.4 SPECIAL WARRANTIES

A. A special warranty is one whose terms, in addition to the standard coverage offered by the manufacturer, contain other special provisions, including:

1. Acknowledgment of specified list of items which shall be specifically noted as being covered by the warranty.

2. Acknowledgment of specific conditions for use or exposure.

3. Extension of warranty to waive standard exceptions or to extend limits including time.

4. Requirements for specific performance by other trades including method of separation and protection from, or assurance of compatibility with, adjacent materials.

5. Assemblies and systems which may include products of other manufacturers.

6. Conditions where certain performance criteria are specified and must be either acknowledged or actual limits are required to be determined by performance testing subject to Owner's review and acceptance.

7. Conditions where manufacturer's continuing involvement such as maintenance or advisory service is required.

B. Maintenance Service During Warranty Period:

1. Reference to routine maintenance required to be performed by the Owner during the warranty period shall be listed in the original submittal of proposed warranty.

2. All other administration and maintenance service required during the warranty period, including installation of items repaired or replaced under the terms of the warranty shall be included in the original Contract.

1.5 SERVICE CONTRACTS

A. Required types of Service Contract Proposals are scheduled under Schedule of Required Submittals and are listed in the Trade Sections.

B. Where specified, the Subcontractor or Manufacturer originally supplying services and skills required for proper maintenance and agreeing to maintain availability of replacement parts and materials.

C. The Service Contract is in addition to, and independent of, the Warranty and shall not act to either extend the Warranty or to reduce the Contractor's responsibilities thereunder.

D. Unless otherwise specified or agreed, Service Contracts shall be written for a period of five (5) years starting with the termination of similar services included under the warranty and shall include cancellation privilege annually when exercised at least 60 days prior to anniversary date.

E. The Contractor shall:

1. Prior to submittal of Manufacturer of Subcontractor for approval, verify that specified service is available and will be offered.

2. Secure from the Manufacturer of Subcontractor a bona fide proposal to perform the specified services.

3. When so directed, assist the Architect in obtaining proposals for the performance of the specified services by other competent parties.

1.6 ADVISORY AND INSPECTION SERVICE

A. Advisory and Inspection Service consists of:

1. Periodic inspection on a regular scheduled basis. Include schedule of proposed inspections in the agreement.

2. All necessary information, including special training, where required to adequately instruct Owner's maintenance personnel in preventative maintenance procedures, and periodic inspection to verify that such procedures are adequate.

3. Providing recommendations for additional preventative maintenance repairs and treatments. If such maintenance work is recommended:

a. Obtain or submit price quotations for recommended work.
b. When so instructed by the Owner, make all necessary arrangements for the performance of the Work.

B. Parts and Materials Agreement:

1. Where standard commercially available parts of materials are suitable for maintenance or repair, inform Owner concerning trade name or description and location where they may be obtained.

2. Where parts or materials are not readily available maintain replacement stocks at a location as required to prevent undue delay in repairs or loss of use of equipment pending delivery.

1.7 MAINTENANCE SERVICE

A. A Maintenance Service Contract is an agreement that in addition to Advisory and Inspection Service, the Manufacturer will provide, or otherwise make available through his agent, a regular maintenance service program scheduled during normal working hours.

B. Proposals shall schedule proposed times for servicing and list the services to be performed.

C. Maintenance service of equipment shall be performed solely by the original Equipment Contractor and shall not be assigned or transferred to any agent or subcontractor without the approval of the Owner.

D. Repairs:

1. Permanent repairs shall be started within seven (7) days after notification by the Owner.

2. In the event that emergency and permanent repairs are not started within the specified time limits, or if the work is stopped without the Owner's consent, the Owner shall have the same options to have repairs performed by others as specified under Warranties without invalidating this agreement.

E. Equipment maintenance shall include systematic examinations, and adjustments and lubrication of all equipment. The Equipment Maintenance Contractor shall repair and replace electrical and mechanical parts whenever required using only genuine standard parts recommended or produced by the manufacturer of the equipment.

F. Addition work when so directed by the Owner shall be included under the work of the Maintenance Contract and the Contractor shall be reimbursed at the then prevailing rate for the cost of materials, labor and services. Such additional work shall include:

1. Repairs or replacement required as a result of negligence, abuse, or other actions contrary to the Equipment Contractor's operating instructions.

2. Improvement or additional equipment required by the Owner, Insurance Companies, or Governmental Authorities.

3. Except for emergency service, the additional cost for overtime work based on the difference between regular and overtime labor when the Owner requests that such work be performed outside of regular working and so authorized in writing.

G. Additional requirements for specific maintenance contracts are specified in the various Trade Sections.

1.8 CERTIFICATION

A. Product Certification: See Division 1.

B. Workmanship Certification is a statement by the applicator or installer that all materials and workmanship in connection with the system, have been furnished and installed in complete conformance with Contract Documents, and with the manufacturer's specifications and requirements for the particular type of use specified.

C. A product certification where specified as a requirement shall be in a form similar to the following:

"We, the (Manufacturing Company), certify that the complete system as detailed and specified can be installed and will perform in accordance with the requirements of the specifications and the ASTM Standards referenced therein for the guarantee period of one year or such longer period as may be negotiated between the Owner and the (Manufacturing Company).

Upon completion of the Project we will inspect the work and certify to the Owner that the system as installed is in accordance with the Manufacturer's requirements or indicated in writing what remedial action is necessary in order that it does so conform."

END OF SECTION

ELECTRONIC PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Specified Herein: General Requirements for preparation and submittal of Project Record Documents.

1.2 DEFINITIONS

A. Record Documents: Copies of the Contract Documents, Shop Drawings, Product Data and Samples maintained at the site for purpose of recording changes and other project information.

B. Maintenance and Parts Manuals: Annotated PDF file format Brochures, instructions, parts lists and similar documents, published by manufacturers and suppliers of materials and equipment for purpose of providing information necessary to maintenance, repair and replacement.

C. "As-Built" Drawings: Except for "as-built" corrections to the Shop Drawings the only record of architectural as-built conditions required will be clean copy of the Contractor's notations on the Record Drawings in Annotated PDF file format, unless otherwise specified.

D. "As-Built" drawings for Mechanical, Electrical and Life Safety or Security Systems shall be fully dimensioned and detailed drawings, in Annotated PDF file format, showing all systems as they exist at the completion of Work.

1.3 SCHEDULES

A. Prepare schedule listing required Record Drawings and Maintenance Manual submittals in accordance with "Submittals" Section of this Division 01.

B. Keep schedule up to date listing record drawings and other documents as they are received from Manufacturers, Suppliers and Subcontractors.

C. Hold all such material until completion of the project and submit when directed.

1.4 DRAWINGS AND SPECIFICATIONS AT THE SITE

A. Each Contractor shall maintain at the site and available for reference by the Owner and the Architect one copy of all Drawings, Specifications, Addenda, approved Shop Drawings, Change Orders and other Modifications applicable to their portion of the Work, in good order and marked to record all changes made during construction.

B. The Drawings, marked to record all changes made during construction, shall be delivered to the Owner upon completion of the Work in Annotated PDF file format.

C. Record Documents: At the date of Final Completion and as condition precedent to Final Payment, each Contractor shall furnish the following documents to the Owner:

1. Record Drawings in PDF file format showing the field changes affecting the general construction, mechanical, electrical, and all other Work, and indicating the Work as actually installed in the building.

    a. These shall consist of carefully drawn markings on a set of black and white prints of the Construction Documents obtained especially for the purpose unless otherwise specified. The prints can be scanned into a PDF file when project is completed or the contractor can keep a Annotated PDF file on site.

    b. The Contractor shall maintain at the job site one set of Construction Documents and indicate thereon each field change as it occurs.

2. A neatly arranged searchable PDF file containing the wiring and control diagrams, operating and maintenance instructions, cuts of all mechanical and electrical equipment and fixtures, as installed including catalogues or parts lists from the prime manufacturer. Said lists shall not be based on local dealer stock number systems.

1.5 RECORD DRAWINGS

A. Record Drawings are required to establish the location of concealed work deviations from details or dimensions indicated on the construction drawings. Where location or dimensions of portions of the work is indicated by note or line drawings or otherwise indicated to be at the option of the Contractor, the final determination of such options shall be indicated in the Record Drawings.

B. Record Drawings are required for information only but are intended to provide complete information for as-built drawings.

C. Final PDF file record copy of all Shop Drawings shall be submitted showing all corrections made and also indicating all field changes or other variations from the details as originally reviewed by the Contractor and the Architect.

1.6 OPERATING AND MAINTENANCE MANUALS

A. Prior to completion of work in this Contract, each Contractor shall submit for review by the Architect searchable PDF file of manufacturer's catalog data covering all fixtures, equipment and finish materials incorporated into the project. Manufacturer's catalog data shall include full identification of the equipment or fixture capacities, current characteristics, dimensions, and identification of all replacement parts. Operating instructions for all installed equipment, including supplier's names and telephone numbers shall be placed on or lettered on the front page of each catalog or manual.

B. Maintenance procedure descriptions shall be submitted for all materials requiring special treatments or continued maintenance work and for all assemblies, which may require parts replacement during the life of the installation. Manuals shall indicate recommended schedule for routine service and shall provide complete instructions for performing such service.

C. Manuals and catalogs shall be searchable PDF format. Each item shall be tab and shall have an index. All material shall be grouped together by specification number.

D. Contractor shall arrange and provide for the services of factory representatives or other authorized qualified specialists to provide operating and maintenance instruction sessions

directly with Owner's related operating and maintenance personnel for the systems, equipment and materials involved.

E. These requirements are in addition to other similar requirements stated elsewhere in the Contract Documents including those of "Warranties" Section of Division 01.

F. Equipment Operation manuals and operating instructions for each item of mechanical and electrical equipment:

1. Operation and Maintenance Charts: Searchable PDF and one (1) hard copy of an operating and maintenance instruction chart which will incorporate applicable comprehensive descriptive instructions, lay-outs, diagrams or any other information that will necessary and/or of value to the operating and maintenance personnel. Hard copy of the charts shall be framed and glazed and mounted at a designated location, and the other three sets shall be included in the operation and maintenance manuals.

2. Operation and Maintenance Manuals: Searchable PDF file of an operation and maintenance manual which shall contain complete instructions for overall operation and maintenance of the facility and its component parts. The manual shall also contain the operating and maintenance instruction charts as specified.

END OF SECTION

CAST IN PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

B. Related Sections:

1. Section 31 1000 Site Preparation
2. Section 31 2000 Earthwork

1.2 SCOPE

A. The work under this section of the specifications shall consist of furnishing all labor, materials and equipment necessary to construct Portland cement concrete pad.

1.3 QUALITY ASSURANCE

A. Reference Standards:

1. American Society for Testing and Materials (ASTM):
   a. ASTM C 94-97 – Standard Specification for Ready Mixed Concrete
   b. ASTM C 171-69 (1975) - Standard Specification for Sheet Materials for Curing Concrete
   c. ASTM C 309-74 - Standard Specification for Liquid Membrane Forming Compound for Curing Concrete
   d. ASTM D 1751-73 - Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

1.4 SUBMITTALS & TEST REPORTS

A. Submit reports of Portland cement concrete compression, yield and air content tests listed in ASTM C 94.

1.5 ENVIRONMENTAL REQUIREMENTS PORTLAND CEMENT CONCRETE

A. Allowable concrete temperatures

1. Cold Weather: Maximum and minimum, ASTM C94
2. Hot Weather: Maximum concrete temperature - 90 degrees F. (23 degrees C.)

B. Do not place concrete during rain, sleet or snow.

1.6 PROTECTION

A. Protect concrete from traffic for minimum of seven (7) days.

1.7 MEASUREMENT

A. Sidewalk shall be considered part of lump sum price as per the proposal form including installation of aggregate base course and topsoil backfilling operation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Ready Mixed Concrete: ASTM C94

1. Cement type: type 3, grade A, 3500 psi (28 day compressive strength)
2. Admixtures: air-entrained 6%
3. Slump: two (2) to three (3) inches
4. Minimum 594 lbs. of cement per cubic yard.
5. No admixtures other than air-entraining without approval of the Landscape Architect.
6. Curing material: ASTM C171, 4 MIL white opaque polyethylene type, or ASTM C309, type 2, white pigmented curing compound.
7. Expansion Joint Fillers: ASTM D1751-73, performed non-extruding, resilient bituminous type, width as indicated on plans.
8. Wire fabric: 6 X 6 10/10 fabric in all slabs on grade unless otherwise indicated.
9. Reinforcing: Reinforcing shall be new, clean and free of rust deformed steel, size and location as noted on drawings.
10. Water: Clean, fresh, potable and free of deleterious amounts of acids, alkalis, organic materials and/or dissolved or suspended materials of any kind.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify the earthwork is completed to correct line and grade. Notify the Owner/Landscape Architect of any incomplete work by previous contractors.

B. Check that sub-grade is smooth, compacted and free of frost or excessive moisture.

C. Do not commence work until conditions are satisfactory.

3.2 WEATHER PROTECTION

A. Cold weather: When the mean daily air temperature is 40 degrees F. or below, provide suitable protection for concrete work to maintain a minimum concrete temperature of 50 degrees F. for five (5) days (or 70 degrees F. for three (3) days). After the protection period, do not let concrete cool more than 20 degrees F. in each successive day

B. Hot weather: Employ suitable means to prevent too rapid drying. Shade fresh concrete as soon as possible without marring surface.

C. Wet weather: Unless adequate protection is provided, do not place concrete in rain, sleet or snow.

3.3 INSTALLATION

A. Contractor shall install the first section of sidewalk as a quality sample in place. Upon approval of sample by Landscape Architect, further installation can proceed.

B. The sub-grade upon which concrete is to be placed shall be prepared by excavation or filling with suitable earth to such depth below the finished grade line, that when tamped or rolled until smooth, firm and hard, the sub-grade will be uniform and at the required depth below finished grade line.

C. Unsuitable sub-grade soils shall be replaced as directed.

D. Gravel backfill, when specified in the drawings, shall be constructed to the required depth and thoroughly compacted.

E. Cast in Place Concrete

1. Set forms to line and grade
2. Install forms over full length of walk and oil before use.
3. Forms shall be set accurately to line and grade. If the forms are set more than 0.01 foot (3mm) above or below grade or more than 0.01 foot (6mm) from prescribed alignment, they shall be corrected before any concrete is placed
4. Flexible or curved forms of proper radii shall be used on all curves having a radius of 100 feet or less.
5. Form contraction joints by tooling.
6. Install expansion joint material behind walks at abutment curbs and adjacent structures with expansion joints every 100 feet (30m) or as detailed. Retaining wall shall have expansion joints every 25 feet.
7. Place top of expansion joint material flush with walk surface, unless noted otherwise on plans.
8. Place concrete with mechanical vibrators.
9. Consolidate concrete with mechanical vibrators.
10. Round edges of walks at top with finishing tool, 1/4" to 3/8" radius. 1" radius for retaining wall.
11. Finished exposed walk surfaces with wood float followed by brushing with broom, smooth band of 12", unless otherwise shown on drawings.
12. Apply plastic sheeting or curing material and cure for seven (7) days.
13. Apply plastic sheeting or curing material
14. Do not allow free drop of more than five (5) feet. Use elephant trunk when necessary.

F. Slip form concrete to the same quality standards as cast in place.

1. Construct concrete walk with slip form curb machine.
2. Apply curing material and cure for seven (7) days.
3. Saw expansion and contraction joints after concrete has sufficiently hardened.

3.4 FIELD QUALITY CONTROL

A. Slump Tests: Make slump tests whenever concrete is being poured at the direction of the Owner.

B. Compression Tests: Prepare standard test cylinders during the placing of concrete in accordance with ASTM 31 and ASTM 172. One set (three (3) cylinders) is required for each day's pour.

C. Maintain two (2) cylinders at 50 to 70 degrees F. and protect from loss of moisture at the job site for a period of not over 48 hours, then deliver to the laboratory for curing and testing at seven (7) and twenty-eight (28) days, respectively. Place third cylinder near the in place concrete and cure completely at the job in the same manner as the in place concrete. Deliver this cylinder to the laboratory for testing at twenty-eight (28) days. Cure and test cylinders in accordance with ASTM C31, C39 and C192. Submit test reports to the Landscape Architect in duplicate

3.5 PROTECTION OF FINISHED SURFACES

A. All finished surfaces of concrete shall be protected so as to prevent damage. Marking temporary nailing or other damaging use of surfaces will be prohibited.

3.6 PATCHING

A. Patch to match material, color and texture of surrounding area.

B. Replace defective work if patching is not acceptable to the Landscape Architect.

3.7 REPAIR/REPLACE

A. Within first year of placement, concrete will be replaced at no additional cost to the Owner, if horizontal and/or vertical cracks exceed 1/8".
B. Hairline cracks do not qualify for concrete replacement.

3.8 CLEAN-UP

A. The Contractor shall remove excess excavated material from the site of the work. Spread and finish grade within five (5) feet of pad edge. Finish grading is incidental to pad installation. Contractor shall clean up and dispose of rubble and construction satisfactory to the Owner and Landscape Architect.

END OF SECTION

PORTLAND CEMENT CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

B. Related Sections:

1. Section 32 1124 Aggregate Base Course

1.2 SCOPE

A. The work under this section of the specifications shall consist of furnishing all labor, materials and equipment necessary to construct Portland cement concrete, turf anchor, concrete slabs, and foundations.

1.3 QUALITY ASSURANCE

A. Reference Standards:

1. American Society for Testing and Materials (ASTM):
   a. ASTM A185 – Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete
   b. ASTM A615 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
   c. ASTM A82 – Standard Specification for Steel Wire, Plain for Concrete Reinforcement
   d. ASTM C172 – Standard Practice for Sampling Freshly Mixed Concrete
   e. ASTM C192 – Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
   f. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete
   g. ASTM C309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
   h. ASTM C31 – Standard Specification for Making and Curing Concrete Test Specimens in the Field
   i. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
   j. ASTM C618 – Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
   k. ASTM C94 – Standard Specification for Ready-Mixed Concrete
   l. ASTM C171-69 (1975) – Standard Specification for Sheet Materials for Curing Concrete
   m. ASTM C309-74 – Standard Specification for Liquid Membrane Forming Compound for Curing Concrete
   n. ASTM D1751-73 – Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

1.4 SUBMITTALS

A. Test Reports: Reports of Portland cement concrete compression, yield and air content tests.

B. Product Data: Submit data for propriety materials and items, including reinforcement and forming

accessories, admixtures, patching compounds, joint systems, curing compounds, and others to the Landscape Architect/Engineer.

C. Shop Drawings

1. Reinforcement: Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 “Manual of Standard Practice for Detailing Reinforced Concrete Structures” showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. Include special reinforcement required and openings through concrete structures.

D. Samples: Submit samples of materials as specified and as otherwise requested by Landscape Architect, including names, sources and descriptions.

E. Material Certificates: Provide materials certificates in lieu of material laboratory test reports when permitted by Landscape Architect/Engineer. Material Certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Portland Cement Concrete

1. Allowable concrete temperatures
   a. Cold Weather: Maximum and minimum.
   b. Hot Weather: Maximum concrete temperature: 90°F. (23°C.)
2. Do not place concrete during rain, sleet or snow.

1.6 PROTECTION

A. Protect concrete from traffic for minimum of seven (7) days.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

A. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit. Minimum thickness for lumber form shall be 1” for boards and 5/8” for plywood.

B. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

C. Forms for Slab-on-grade construction joints: Forms for slab-on-grade construction joints shall be prefabricated metal forms to produce tongue and groove joint. Form shall be approved by Architect/Engineer.

D. Synthetic turf anchoring curb system: Forms shall be prefabricated metal forms to produce tongue and groove joint. Automated self propelled curb-and-gutter equipment shall not be allowed.

2.2 REINFORCING MATERIALS

A. Reinforcing Bars: Grade 60, deformed

B. Steel Wire: Plain, cold drawn, steel

C. Welded Wire Fabric: Welded steel wire fabric, supplied in flat sheets.

D. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications, unless otherwise acceptable. Wood, brick and other devices shall not be acceptable.

1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs. Concrete block or brick for support of reinforcement for slabs on grade shall be at least 2” wide, 3” long and of proper heights.

2.3 READY MIXED CONCRETE

A. Cement type: type “1, 3500 psi” (28 day compressive strength)

B. Admixtures:

1. Air-entrained - 6%
2. Fly Ash – Class C or F, except as modified herein.
   a. Loss of ignition shall not exceed 4%.
   b. Fine amount retained shall not exceed 25%.
   c. Furnish documentation from an independent testing agency that fly-ash proposed for this project conforms to this specification.”

C. Slump: two (2) to three (3) inches.

D. Minimum 564 lbs. of cement per cubic yard.

E. No admixtures other than air-entraining without approval of the Architect.

F. Water: Clean, fresh, potable and free of deleterious amounts of acids, alkalis, organic materials and/or dissolved or suspended materials of any kind.

2.4 CURING MATERIAL

A. ASTM C171 4 MIL white opaque polyethylene type, or ASTM C309, type 2, white pigmented curing compound.

2.5 EXPANSION JOINT FILLERS

A. Preformed non-extruding, resilient bituminous type, width as indicated on plans.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify the earthwork is completed to correct line and grade. Notify the Owner/Architect of any

incomplete work by previous contractors.

B. Check that sub-grade is smooth, compacted and free of frost or excessive moisture.

C. Do not commence work until conditions are satisfactory.

3.2 WEATHER PROTECTION

A. Cold weather: When the mean daily air temperature is 40°F. or below, provide suitable protection for concrete work to maintain a minimum concrete temperature of 50°F. for five (5) days (or 70°F. for three (3) days). After the protection period, do not let concrete cool more than 20°F. in each successive day.

B. Hot weather: Employ suitable means to prevent too rapid drying. Shade fresh concrete as soon as possible without marring surface.

C. Wet weather: Unless adequate protection is provided, do not place concrete in rain, sleet or snow.

3.3 INSTALLATION

A. Contractor shall install the first section of sidewalk/slab/foundation as a quality sample in place. Upon approval of sample by Architect, further installation can proceed.

B. The sub-grade upon which concrete is to be placed shall be prepared by excavation or filling with suitable earth to such depth below the finished grade line, that when tamped or rolled until smooth, firm and hard, the sub-grade will be uniform and at the required depth below finished grade line.

C. Unsuitable sub-grade soils shall be replaced as directed.

D. Gravel backfill, when specified in the drawings, shall be constructed to the required depth and thoroughly compacted.

E. Cast in Place Concrete:

1. Set forms to line and grade
2. Install forms over full length of walk and oil before use.
3. Forms shall be set accurately to line and grade. If the forms are set more than 0.01 foot (3mm) above or below grade or more than 0.01 foot (6mm) from prescribed alignment, they shall be corrected before any concrete is placed.
4. Flexible or curved forms of proper radii shall be used on all curves having a radius of 100 feet or less.
5. Form contraction joints by tooling.
6. Install expansion joint material behind walks at abutment curbs and adjacent structures with expansion joints every 100 feet (30m) or as detailed. Retaining wall shall have expansion joints every 25 feet.
7. Provide sawcuts in concrete turf anchor every 10 feet. Sawcut depth shall be no more 3/4" deep and 1/8" in width.
8. Place top of expansion joint material flush with walk surface, unless noted otherwise on plans.
9. Place reinforcing materials.
10. Place concrete with mechanical vibrators.
11. Consolidate concrete with mechanical vibrators.
12. Round edges of walks and turf anchor at top with finishing tool, ¼" to $^{3}/_{8}$" radius. 1" radius for retaining wall.

13. Finished exposed walk surfaces with wood float followed by brushing with broom, smooth band of 12", unless otherwise shown on drawings.
14. Apply plastic sheeting or curing material and cure for seven (7) days.
15. Replace sections that pocket water.
16. Do not allow free drop of more than five (5) feet. Use elephant trunk when necessary.

3.4 FIELD QUALITY CONTROL

A. Slump Tests: Make slump tests whenever concrete is being poured at the direction of the Owner.

B. Compression Tests: Prepare standard test cylinders during the placing of concrete in accordance with ASTM C31 and ASTM C172. One set (three (3) cylinders) is required for each day's pour.

C. Maintain two (2) cylinders at 50 to 70°F. and protect from loss of moisture at the job site for a period of not over 48 hours, then deliver to the laboratory for curing and testing at seven (7) and twenty-eight (28) days, respectively. Place third cylinder near the in place concrete and cure completely at the job in the same manner as the in place concrete. Deliver this cylinder to the laboratory for testing at twenty-eight (28) days. Cure and test cylinders in accordance with ASTM C31, C39 and C192. Submit test reports to the Architect in duplicate.

3.5 PROTECTION OF FINISHED SURFACES

A. All finished surfaces of concrete shall be protected so as to prevent damage. Marking temporary nailing or other damaging use of surfaces will be prohibited.

3.6 PATCHING

A. Patch to match material, color and texture of surrounding area.

B. Replace defective work if patching is not acceptable to the Landscape Architect.

3.7 REPAIR/REPLACE

A. Within first year of placement, concrete will be replaced at no additional cost to the Owner, if horizontal and/or vertical cracks exceed 1/8”.
B. Hairline cracks do not qualify for concrete replacement.

3.8 CLEAN UP

A. The Contractor shall remove excess excavated material from the site of the work. Spread and finish grade topsoil within five (5) feet of pad edge. Topsoiling is incidental to concrete installation. Contractor shall clean up and dispose of rubble and construction debris satisfactory of the Owner and the Landscape Architect.

END OF SECTION

ARCHITECTURAL RAILING SYSTEM

PART 1 – GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

B. Section Includes:

1. Aluminum pipe handrails and guardrails.

    a. Provide concealed mechanical fasteners at connections and structural adhesive for splices.
    b. Fabricate railing system embedded into concrete.

C. Related Requirements in other Sections:

1. Section 03 3000 - Cast-In-Place Concrete.

1.2 SCOPE

A. The work under this section of the specifications shall consist of furnishing all labor, materials and equipment necessary for a new pipe railing system as indicated herein and on Contract Documents. Work shall include but not limited to footings, posts, rails, and all related hardware.

1.3 QUALITY ASSURANCE AND WARRANTY GUARANTEE

A. Reference Standards:

1. American Architectural Manufacturers Association (AAMA):

    a. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels

    b. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels

2. Americans with Disabilities Act Accessibility Guidelines (ADAAG).

3. American Society of Mechanical Engineers (ASME).

4. American National Standards Institute (ANSI):

    a. ANSI/ASME B 18.6.4 - Mechanical and Quality Requirements for Tapping Screws.

5. ASTM International (ASTM):

    a. ASTM A 53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

    b. ASTM A 67 - Standard Specification for Steel Tie Plates, Low-Carbon and High-Carbon-Hot-Worked.

    c. ASTM A 167 - Stainless and heat resisting Chromium-Nickel steel plate, sheet and strip

    d. ASTM A 269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

    e. ASTM A 312 - Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.

f. ASTM A 1008 - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.

g. ASTM B 26 - Standard Specification for Aluminum-Alloy Sand Castings.

h. ASTM B 29 - Standard Specification for Refined Lead.

i. ASTM B 179 - Standard Specification for Aluminum Alloys in Ingot and Molten Forms for Castings from All Casting Processes.

j. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

k. ASTM B 210 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.

l. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

m. ASTM B 247 - Standard Specification for Aluminum and Aluminum-Alloy Die Forgings, Hand Forgings, and Rolled Ring Forgings.

n. ASTM B 429 - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.

o. ASTM E 935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.

6. Code of Federal Regulations (CFR):

   a. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials.

7. International Building code (IBC).

8. Occupational Safety and health Administration (OSHA).

B. PERFORMANCE REQUIREMENTS

1. The Contractor and any Sub-Contractor hereunder guarantee their respective work against defective materials or workmanship for a period of two (2) years from the date of filing Certificate of Substantial Completion and as accepted by the Owner.

2. All material installed under this specification shall be subject to testing by the Owner. Any material so inspected and found to be not in strict conformance with this specification shall be promptly removed and replaced by the Contractor at his expense.

3. Structural Performance: Railings capable of withstanding effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   a. Handrails:
      i. Uniform load of 50 lbf per ft (729.7 N per m) applied in any direction.
      ii. Concentrated load of 200 lbf (889.6 N) applied in any direction.
      iii. Uniform and concentrated loads need not be assumed to act concurrently.
   b. Top Rails of Guards:
      i. Uniform load of 50 lbf per ft (729.7 N per m) applied in any direction.
      ii. Concentrated load of 200 lbf (889.6 N) applied in any direction.
      iii. Uniform and concentrated loads need not be assumed to act concurrently.
   c. Infill Area of Guards:
      i. Horizontal concentrated load of 50 lbf per sq ft (2394 N per sq m)
      ii. at any point in system, including panels, intermediate rails, balusters, or other elements composing infill area. Load on infill area need not be assumed to act concurrently with loads on top rails.

4. Thermal Movement: Exterior railings shall allow for thermal movement resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
    a. Temperature Change (Range): 120 degrees F (48.9 degrees C), ambient; 180 degrees F (82.2 degrees C), material surfaces.
5. Corrosion Control: Prevent galvanic action and other corrosion types. Insulate metals and other materials from direct contact with incompatible materials.

1.4 QUALIFICATIONS

A. Manufacturer: Company specializing in the manufacturing of products specified in this section with a minimum of ten (10) years experience

B. Installer: Company specializing in performing work of this section with a minimum of five (5) years experienced.

1.5 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
    a. Railing, grout, anchoring cement and paint products.
    b. Preparation instructions and recommendations.
    c. Storage and handling requirements and recommendations.
    d. Installation methods.

B. Shop Drawings: Prior to fabrication submitted which include the following:
    a. Plan views showing location of handrail required for the project with all necessary dimensions.
    b. Detail drawings which show standard handrail elevations, typical railing connections, anchoring systems and expansion joints.
    c. Drawings shall be signed and sealed by a structural engineer indicating compliance with design loads specified.

C. Qualification Data: For professional engineer
.

D. Product Test Reports: Supplier shall submit calculations and test reports for complete system. Test Data per ASTM E 935.

E. Verification Samples: For each finish product specified, two samples, minimum size 6 inch (152 mm) square, representing actual product, color, and patterns.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver railing systems and related components in protective packaging.

    1. Upon delivery open cartons and carefully inspect for damage.
    2. Contact manufacturer if there are questions or problems.
    3. Maintain material in original packaging until installation.

B. Store components to avoid damage from moisture, abrasion, and other construction activities.

1.7 SITE CONDITIONS

A. Field Measurements: Take measurements of actual dimensions where necessary for fit without gaps. Indicate measurements on shop drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Rail, Post, Picket: Aluminum extrusions; alloy and temper 6063-T4. Pipe: ASTM B 429.

B. Structural Performance: Engineer, fabricate, and install handrails, guardrails, and railing systems to withstand, when tested per ASTM E 935, loadings required by applicable building and safety codes but not less than the following:
1. Concentrated and uniform loading need not be applied simultaneously
2. Uniform load: 50 pounds per foot applied at the top in any direction.
3. Concentrated load: 200 pounds applied at the top in any direction.

C. Base Flanges, Anchors, and Railing Accessories: ASTM B 247

1. Manufacturer's standard 713 aluminum alloy cast bases or solid aluminum 6063 stock.

D. Fasteners: Provide concrete anchorage for fastening and complying with applicable Federal standards. All fasteners used in the system shall be aluminum or stainless steel.

E. Sleeves: ASTM A 120 or ASTM A 53 pipe.

F. Grout: Non-shrink Portland cement-based hydraulic grout mixed and applied in accordance with manufacturer's instructions; gypsum based material are not acceptable.
1. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.2 ASSEMBLY

A. Configuration: Size and space members in compliance with applicable codes. All posts shall be unspliced single pipe length. Lower rails shall be a single unspliced length between posts. All top rails shall be continuous whenever possible.

1. Vertical posts spacing shall not exceed 6 foot 0 inch center-to-center.

2. Vertical picket spacing shall not exceed 4 inch center-to-center.
3. Fabricate railing system to meet step railing requirements; riser and tread dimensions of the steps.
3. Open tube ends or sections are not acceptable.

B. All posts grouted in concrete to have one nominal 1/4 inch nominal diameter weep hole, 1/2 inch nominal above post collar, in the plane of the rail.

C. Provide all posts with a 19 inch hollow rod for internal reinforcing.

D. Fit, shape and assemble components in largest practical sizes, for delivery to the site. Fabricate components with joints tightly fitted and secured.

1. All pipe cuts shall be square and accurate for minimum joint-gap. Cuts shall be clean and free of chamfer, from deburring, nicks and burrs.
2. Drill holes of proper size for a tight flush fit of rivets and screws.

E. Provide components required for anchorage of framing. Fabricate anchors and related components of material and finish as required, or as specifically noted.

2.3 FINISHES

A. Prefabrication External Protection:
   a. Kynar 500 Fluoropolymer coating per AAMA 2605 minimum.
   b. Color: To be selected from the manufacturer's available color palette.
   c. Color: As specified in the finish schedules of the Contract Documents.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Installer's Examination: Examine conditions under which construction activities of this section are to be performed.

1. Submit written notification to Architect and system manufacturer if such conditions are unacceptable.
2. Beginning of erection constitutes installer's acceptance of conditions.

3.2 PREPARATION

A. Ensure that adjacent surfaces, structures, and finishes are protected from damage by construction activities of this section.

B. Use wood blocks and padding to prevent damage to railing members and fittings during installation.

3.3 INSTALLATION

A. Install units in accordance with the manufacturer's instructions. Keep perimeter lines straight, plumb, and level. Provide grounds, clips, backing materials, adhesives, brackets, anchors, and accessories necessary for a complete installation.
   1. Sleeve Mounting:
      a. Arrange for casting of sleeves or core drill insitu concrete to provide holes for railing uprights.
      b. After setting, fill holes with hydraulic grout; brace members until grout is cured.

B. Connect railing components with mechanical and or adhesive joints.

1. All pipe railing splices should be made no more than 12 inches from the nearest post.
2. Tighten all fasteners so that completed railing is rigid and free of play at joints and component attachments.

C. Expansion Joints: Provide expansion joints for continuous spans in excess of 40 feet. Construct joints by deleting structural adhesive from one end of the spliced joint so that it is free to move in or out of the pipe. If a joint is provided every 30 feet (9.0m), the width of the gap should allow 1/8 inch expansion for each 40°F of expected temperature rise.

D. Erection Tolerances: Install railings plumb and level, securely fastened, with vertical members plumb.

1. Maximum variation from plumb: 1/4 inch
2. Maximum misalignment from true position: 1/4 inch
3. Maximum misalignment between adjacent separated members: 1/8 inch

3.4 CLEANING

A. Remove dust or other foreign matter from component surfaces; clean finishes in accordance with manufacturer's instructions.

B. Clean units in accordance with the manufacturer's instructions.

3.5 PROTECTION

A. After installation, protect installed work until project completion.

1. Ensure that finishes and structure of installed systems are not damaged by subsequent construction activities.

B. If minor damage to finishes occurs, repair damage in accordance with manufacturer's recommendations; provide replacement components if repaired finishes are unacceptable to Architect.

END OF SECTION

TURF ANCHOR

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

B. Related Sections:

1. Section 03 3010 Portland Cement Concrete

1.2 SCOPE

A. Provide all material, labor, and equipment necessary to install the timber and cleanup as detailed on the drawings and herein.

PART 2 - PRODUCTS

2.1 TIMBER EDGING

A. Southern Pine or Douglas Fir pressure preservative treated with alkaline copper quaternary (ACQ) or Copper Azole (CA) preservatives in accordance with American Wood Preservers Associates (AWPA) standard C17 for ground contact use. Provide lumber sizes as indicated on drawings.

B. All hardware shall meet a minimum requirement established ASTM standard A153 and ASTM standard A653 (Class G-185).

2.2 WOODEN NAILER FASTENERS

A. Approved items for Wood Nailer Installation:

1. Nails 16 d Hot Dipped Galvanized
2. ¼ x 2 ¾" Stainless Steel Tapcon Masonry Screws
3. DEC-King Exterior Wood Screw with Climacoat
4. Wood to-Metal TEKS with Grey Spex
5. Tapcon Concrete Anchor with Blue Climaseal and White Ultrashield
6. Roofgrip with Spex or Blue Climaseal
7. GYP-FAST Nail with Climacoat
8. Maxi-set Tapcon White UltraShield
9. Ramguard Drive Pin

PART 3 - EXECUTION

3.1 DEMOLITION, EXCAVATION AND REMOVALS

A. Strip all existing topsoil, infield mix, etc. from work area. Stockpile sufficient material for restoration of perimeter area. Legally dispose of excess material off site.

3.2 GRADING

A. Grade area to elevations and slopes as indicated on the drawings. Grade shall be such that when finished grade is established, the work area and the perimeter shall be free of standing water.

3.3 INSTALLATION OF TIMBER EDGING

A. Install wood nailer using only the specified fasteners listed in Section 2.2 above.

B. Fasteners shall be placed in the middle (vertical) of nailer board. Fastener shall be no closer than 6” from end of board.

C. Fasteners spacing shall not be more than 2.5’

D. Contractor shall maximize use of treated lumber and minimize cuts to corners.

3.4 RESTORATION AND CLEAN UP

A. Clean-up all excess materials and remove from site. Adjoining areas to be the same as prior to construction, and properly graded to allow water to drain away from surface.

END OF SECTION

GLASS FIBER REINFORCED POLYMER

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

B. Related Sections:

1. Section 11 6800 Playground Equipment

1.2 SCOPE

A. The work under this section of the specifications shall consist of furnishing all labor, materials and concrete foundations, to provide the Owner with complete and satisfactory playground equipment. These playgrounds shall be completed and ready for operation and shall include all items necessary for the proper use of the system, whether incorporated in this specification or not.

1.3 QUALITY ASSURANCE AND REFERENCES

A. All finished installations shall conform to all applicable current CPSC and ASTM guidelines.

B. References
   a. ASTM C 150 – Standard Specifications for Portland Cement; 1999a.
   b. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials; 1999.
   c. ASTM G 23 – Standard Practice for Operating Light-Exposure of Nonmetallic Materials; 1996.
   d. ASTM F1487-11 – Standard Consumer Safety Performance Specification for Playground Equipment for Public Use
   e. ASTM F2373-11 – Standard Consumer Safety Performance Specification for Public Use Playground Equipment for Children 6 Months through 23 Months
   f. Consumer Product Safety Council (CPSC) Handbook for Public Playground Safety

C. Manufacturer’s warranty shall apply for all play equipment.

1.4 SUBMITTALS

A. Manufacturer’s Literature: Furnish to Architect, when required, copies of manufacturer’s specifications, and samples.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The following are acceptable manufacturers.
   a. Themed Concepts 855-724-3270 www.themedconcepts.com

2.2 MATERIALS

A. Glass Fiber Reinforced Concrete Fabrications: High density concrete made of ASTM C 150 Portland cement, crushed stone, silica sand, and polymers reinforced with continuous filament glass fiber mat and structural reinforcing as required; asbestos free.
B. Color: As selected from manufacturer's selection.
C. Color: To match Architect's sample.
D. Density: 140pcf (2240 kg/cu m).
E. Shell Thickness: 1/2" to 2 inch, nominal
F. Surface Burning Characteristics: Flame spread index of 0, smoke developed index of 5; when tested in accordance with ASTM E 84.
G. Weather Resistance: No significant loss of strength or change in appearance after 200 hours accelerated weathering conducted in accordance with ASTM G 23.
H. Compressive Strength: Over 5000 psi (34 MPa).

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install as per manufacturer's installation instructions.

3.2 EXAMINATION

A. Do not begin installation until substrates have been properly constructed.
B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
C. Check field dimensions before beginning installation. If dimensions vary too much from design dimensions for proper installation, notify Architect and wait for instructions before beginning installation.

3.3 PREPARATION

A. Clean surfaces thoroughly prior to installation.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
C. Install supplementary, temporary, and permanent supports as required for proper installation

3.4 INSTALLATION

A. Install in accordance with applicable code and manufacturer's recommendations; shim where necessary.
B. Patch exposed anchor points to match color and texture of unit.

3.5 PROTECTION

A. Protect installed products until completion of project.
B. Touch-up, repair, or replace damaged products before Substantial Completion.

C. Do not allow access until protective ground surfacing is in place, and inspections are complete.

3.6 GENERAL CLEAN-UP AND DISPOSAL

A. Remove from the site all equipment, materials, and debris resulting from construction work including this section. Leave work area clean and in a condition acceptable by the Landscape Architect and Troy School District. All work shall be complete, ready for use, at the time of final acceptance.

END OF SECTION

INTERIOR SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Refer to Drawings for sign types, sign copy listing, and sign locations.

1.2 SUMMARY

A. This Section includes the following:

1. Interior plastic signage.

2. Cast metal plaques.

B. Related Sections include the following:

1. Division 10 Section "Exterior Signs" for freestanding exterior panel signs.

1.3 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of sign.

B. Shop Drawings: Include plans, elevations, and large-scale sections of typical members and other components. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.

1. Provide message list for each sign, including large-scale details of wording, lettering, artwork, and braille layout.

C. Samples for Initial Selection: For each type of sign material indicated that involves color selection.

D. Samples for Verification: For each type of sign, include the following Samples to verify color selected:

1. Casting: Show representative texture, character style, spacing, finish, and method of attachment.

2. Approved samples will not be returned for installation into Project.

E. Qualification Data: For Installer.

F. Maintenance Data: For signage cleaning and maintenance requirements to include in maintenance manuals.

G. Replacement Instructions: Provide in writing, instructions to Owner on how to replace name inserts, turn around time required, etc.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain each sign type through one source from a single manufacturer.

B. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction.

C. Product Options: Drawings indicate size, profiles, and dimensional requirements of signage and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."

1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

1.5 PROJECT CONDITIONS

A. Field Measurements: Where sizes of signs are determined by dimensions of surfaces on which they are installed, verify dimensions by field measurement before fabrication and indicate measurements on Shop Drawings.

1.6 COORDINATION

A. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs.

1. For signs supported by or anchored to permanent construction, furnish templates for installation of anchorage devices.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Basis-of-Design Product: The design for each sign is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.2 INTERIOR PLASTIC SIGNAGE

A. Manufacturer:

1. Subject to compliance with requirements, provide signs as manufactured ASI Sign Systems, Inc. or equal by one of the following:

a. Supersine Company
b. Approved equal.

2. Basis of design product: ASI PUZZLE Sign

B. Sign Construction:

1. Flat Interior window signs with header panel, paper insert window and base panel:
2. Size: As indicated on drawings

3. Panel Materials for header and base panel: Standard frame, header panels and base panels manufactured from acrylic. Header panels and base panels are finished with a series of foils or frosted acrylic options.
4. Panel Colors: Select from the manufacturer's standard finishes grid:

    a. Natural Series.

        1) Standard frame body colors: Grey, Brown, Cream.
        2) Foil finishes for header and base panels: Polished Concrete, Dark Teak, Grey Ash, Dark Walnut, Medium Oak, Light Oak.

    b. Pastel Series.

        1) Standard frame body colors: Pastel Violet, Pastel Blue, Pastel Mint, Pastel Lemon, Pastel Orange, Pastel Raspberry, Pastel Grape, Matt Black, Matt White.
        2) Foil finishes for header and base panels:

5. Window Lens: Acrylic lens for window: clear acrylic cover
6. Graphic Technique:

    a. ADA Ready™ Header Panels:

        1) ADA compliant Grade II Raster Braille and raised letters

    b. Letter styles[s] and letter size[s]: Architect to select from manufacturer's standard letter styles chart.
    c. Text schedule: As indicated on drawings

7. Locking system: Header Panel attached to Sign body by means of ABS plastic male and female Jigsaw™ components. The system locks without any hardware required by pushing the header panel to the left and then pushing it up.

2.3 CAST METAL PLAQUES

A. General: Provide castings free from pits, scale, sand holes, and other defects. Comply with requirements specified for metal, border style, background texture, and finish and in required thickness, size, shape, and copy.

B. Manufacturer:

1. Subject to compliance with requirements, provide cast metal plaques as manufactured by ASI Sign Systems or approved equal.

C. Aluminum Castings: Provide aluminum castings of alloy and temper recommended by sign manufacturer for casting process used and for use and finish indicated.

D. Border Style: As selected by Architect from manufacturer's standards.

E. Background Texture: Manufacturer's standard pebble texture.

F. Mounting: Concealed studs for substrates encountered.

G. Finish: Raised letters shall be satin polished; the entire tablet then sprayed with two coats of clear metal lacquer.

H. Cast-Metal Plaque Finishes:

1. Raised Areas: Hand-tool and buff borders and raised copy to produce manufacturer's standard satin finish.

2. Background Finish: Painted.

a. Color: As selected by Architect.

3. Protective Finish: Entire plaque shall have two coats of clear metal lacquer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Locate sign units and accessories where indicated on Sign Location Drawings, using mounting methods of the type described in Sign Type Drawings, and in compliance with the manufacturers' instructions.

1. Examine areas to receive signage; notify Building Contractor/Architect in writing of unacceptable substrate. Beginning work indicates acceptance of substrate.

2. Install signs level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance.

3. Mount directly on glass with double face foam tape, reinforce with clear silicone adhesive. Install back shield on opposite side of glass of same type and color as face panel.

4. Mount wall signs with double face foam tape and reinforce with clear silicone adhesive.

B. Cast-Metal Plaques: Mount plaques using standard fastening methods recommended in writing by manufacturer for type of wall surface indicated.

1. Concealed Mounting: Mount plaques by inserting threaded studs into tapped lugs on back of plaque. Set in predrilled holes filled with quick-setting cement.

3.2 CLEANING AND PROTECTION

A. At completion of the installation, clean soiled sign surfaces in accordance with the manufacturer's instructions. Protect units from damage until acceptance by the Owner.

END OF SECTION

EXTERIOR SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Nonilluminated post-and-panel signs.
2. Internally illuminated pylon signs.
3. Field-applied, vinyl-character signs.

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for concrete foundations, concrete fill in postholes, and setting anchor bolts in concrete foundations for signs.

1.3 DEFINITIONS

A. Illuminated: Illuminated by lighting source integrally constructed as part of the sign unit.

1.4 COORDINATION

A. Furnish templates and tolerance information for placement of sign-anchorage devices embedded in permanent construction by other installers.

B. Furnish templates for placement of electrical service embedded in permanent construction by other installers.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For signage.

1. Include fabrication and installation details and attachments to other work.
2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
3. Show message list, typestyles, graphic elements, and layout for each sign at least.
4. Show locations of electrical service connections.
5. Include diagrams for power, signal, and control wiring.

C. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.

1. Include representative Samples of available typestyles and graphic symbols.

D. Samples for Verification: For each type of sign assembly, showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:

1. Post-and-Panel Signs: Not less than 12 inches (300 mm) square, including corner and post.

2. Pylon Signs: Not less than 12 inches (300 mm) square, including corner.

3. Variable Component Materials: [Full-size Sample] [8-inch (200-mm) Sample] <Insert size> of each base material, character or graphic element, in each exposed color and finish not included in other Samples.

4. Exposed Accessories: Full-size Sample of each accessory type.

5. Full-size Samples, if approved, will be returned to Contractor for use in Project.

E. Product Schedule: For post-and-panel and pylon signs. Use same designations indicated on Drawings or specified.

F. Delegated-Design Submittal: For signs indicated in "Performance Requirements".

1. Include structural analysis calculations for signs indicated to comply with design loads; signed and sealed by the qualified professional engineer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Evaluation Reports: For post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

C. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials**,** from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.10 FIELD CONDITIONS

A. Field Measurements: Verify locations of anchorage devices and electrical service embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.

1.11 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

   a. Deterioration of finishes beyond normal weathering.
   b. Deterioration of embedded graphic image.
   c. Separation or delamination of sheet materials and components.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design sign structure and anchorage of post-and-panel and pylon sign type(s) according to structural performance requirements.

B. Structural Performance: Signs and supporting elements shall withstand the effects of gravity and other loads within limits and under conditions indicated.

1. Wind Load: 120 MPH (3 sec gust).

C. Thermal Movements: For exterior signs, allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

D. Accessibility Standard: Comply with applicable provisions in the ICC A117.1.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 POST-AND-PANEL SIGNS

A. Post-and-Panel Sign hollow-box configuration; with smooth, uniform surfaces and support assembly; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

1. Signage system Basis of Design: ASI Sign Systems, Inc., ASI Signage Innovations, 8181 Jetstar Drive, Suite 100, Irving, Texas 75063;
2. Acceptable Product: COMPASS Exterior Panel Sign System,
3. Two sided, Double Post and Panel Signs:
4. Panel size: As indicated on drawings.
5. Panel type: Regular panel, 1" (25 mm) thick.
6. Panel Attachment Type: Top loading panels.
7. Posts: Aluminum, Square Posts: 3 ¼” x 3 ¼" (60 mm x 60 mm), one channel posts.
   a. Finish and Color: As selected by Architect from manufacturer's full range
8. Mounting: Manufacturer’s standard galvanized steel ground sleeve
9. Sign Materials

   a. Aluminum Panels: Meeting ASTM B209, alloy EN 5052 H12, minimum 0.05" (1.25mm) thick.
   b. Aluminum Extrusions: Meeting ASTM B221, alloy 6063-T5.

c. Accessories: Provide end caps, couplings, coupling fittings, mounting fittings, interchangeable fittings, and other hardware and accessories for a complete installation.

10. Sign-Panel-Face Finish and Applied Graphics:

a. Manufacturer's standard two-phase, high temperature cured polyester color coating as follows:

1) Primer: 2 mil thick chromium layer for optimum surface coat adhesion and weatherability.
2) Top Coat: Two-component, water-based, non-toxic, lead-free, zero emissions, high temperature cured polyester coating of 2-3 mil thickness.

a) Colors: As selected from manufacturer's standard colors

3) Graphic technique: LTV series die cut vinyl.

a) Text and Graphic colors: As selected from manufacturer's standard colors

2.3 PYLON SIGNS

A. Pylon Sign: Sign with smooth, uniform surfaces and support assembly; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

1. Signage system Basis of Design: ASI Sign Systems, Inc., ASI Signage Innovations, 8181 Jetstar Drive, Suite 100, Irving, Texas 75063

2. Acceptable Product: Two-sided custom fabricated, internally illuminated aluminum pylon sign

3. Illuminated Sign: Backlighted construction with LED lighting including transformers, insulators, and other accessories for operability, with provision for servicing and concealing connections to building electrical system. Use tight or sealed joint construction to prevent unintentional light leakage. Space lamps apart from each other and away from sign surfaces as needed to illuminate evenly.

a. Power: 120 V, 60 Hz, 1 phase, 15 A.
b. Weeps: Provide weep holes to drain water at lowest part of exterior signs.
c. Copy: Routed and backed with Lexan

4. Panel size: As indicated on drawings.

5. Box depth: 1’-3 1/4" deep.

6. Mounting: Manufacturer’s standard internal galvanized steel posts

7. Sign Materials

a. Aluminum Panels: Meeting ASTM B209, alloy EN 5052 H12, minimum 0.05" (1.25mm) thick.
b. Aluminum Extrusions: Meeting ASTM B221, alloy 6063-T5.
c. Accessories: Provide end caps, couplings, coupling fittings, mounting fittings, interchangeable fittings, and other hardware and accessories for a complete installation.

8. Sign-Panel-Face Finish and Applied Graphics:

a. Manufacturer's standard two-phase, high temperature cured polyester color coating as follows:

1) Primer: 2 mil thick chromium layer for optimum surface coat adhesion and weatherability.
2) Top Coat: Two-component, water-based, non-toxic, lead-free, zero emissions, high temperature cured polyester coating of 2-3 mil thickness.

a) Colors: As selected from manufacturer's standard colors

3) Graphic technique: routed copy backed with Lexan.

a) Text and Graphic colors: As selected from manufacturer's standard colors

2.4 FIELD-APPLIED, VINYL-CHARACTER SIGNS

A. Field-Applied, Vinyl-Character Sign : Prespaced characters die cut from **3- to 3.5-mil (0.076- to 0.089-mm)** thick, weather-resistant vinyl film with release liner on the back and carrier film on the front for on-site alignment and application.

1. Size: As indicated on Drawings.

2. Substrate: Glass and Doors.

3. Text and Font: As indicated on Drawings.

2.5 MATERIALS

A. Aluminum Sheet and Plate: ASTM B 209 (ASTM B 209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

B. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

C. Steel Materials:

1. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating, either commercial or forming steel.

2. Hot-Rolled, Structural-Steel Shapes: ASTM A 36/A 36M or ASTM A 529/A 529M.

3. Steel Members Fabricated from Plate or Bar Stock: ASTM A 529/A 529M or ASTM A 572/A 572M, 42,000-psi (290-MPa) minimum yield strength.

4. Steel Tubing or Pipe: ASTM A 500/A 500M, Grade B.

5. Bolts for Steel Framing: ASTM A 307 or ASTM A 325 (ASTM A 325M) as necessary for design loads and connection details.

6. For steel exposed to view on completion, provide materials having flat, smooth surfaces without blemishes. Do not use materials whose surfaces exhibit pitting, seam marks, roller marks, rolled trade names, or roughness.

D. Acrylic Sheet: ASTM D 4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).

E. Fiberglass Sheet: Multiple laminations of glass-fiber-reinforced polyester resin with UV-light stable, colorfast, nonfading, weather- and stain-resistant, colored polyester gel coat, and with manufacturer's standard finish.

F. Polycarbonate Sheet: ASTM C 1349, Appendix X1, Type II (coated, mar-resistant, UV-stabilized polycarbonate), with coating on both sides.

G. Vinyl Film: UV-resistant vinyl film of nominal thickness indicated, with pressure-sensitive, permanent adhesive on back; die cut to form characters or images as indicated on Drawings and suitable for exterior applications.

H. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.6 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following unless otherwise indicated:

1. Use concealed fasteners and anchors unless indicated to be exposed.

2. For exterior exposure, furnish stainless-steel or hot-dip galvanized devices unless otherwise indicated.

3. Exposed Metal-Fastener Components, General:

a. Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.

4. Inserts: Furnish inserts to be set by other installers into concrete or masonry work.

B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

C. Anchoring Materials:

1. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

a. Water-Resistant Product: At exterior locations, provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.7 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

1. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in locations concealed from view after final assembly.

2. Mill joints to tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.

3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed joints of flux, and dress exposed and contact surfaces.

4. Conceal fasteners and anchors unless indicated to be exposed; locate exposed fasteners where they will be inconspicuous.

5. Internally brace signs for stability, to meet structural performance loading without oil-canning or other surface deformation, and for securing fasteners.

B. Post Fabrication: Fabricate posts designed for structural performance indicated and of lengths required for installation method indicated for each sign.

1. Aluminum Posts: Manufacturer's standard 0.125-inch- (3.18-mm-) thick, extruded-aluminum tubing unless otherwise indicated, with brackets or slots to engage sign panels. Include post caps, fillers, spacers, junction boxes, access panels, reinforcement where required for loading conditions, and related accessories required for complete installation.

2. Steel Posts: Fabricate from minimum 0.120-inch- (3.05-mm-) thick, steel tubing unless otherwise indicated. Include post caps, fillers, spacers, junction boxes, access panels, reinforcement where required for loading conditions, and related accessories required for complete installation.

a. Hot-dip galvanize post assemblies after fabrication according to ASTM A 123/A 123M.

3. Direct Burial: Fabricate posts 36 inches (910 mm) longer than height of sign to permit direct burial or embedment in concrete foundations or concrete-filled postholes.

4. Baseplates: Fabricate posts with baseplates welded to bottom of posts. Drill holes in baseplate for anchor-bolt connection.

a. Provide drilled-in-place anchor bolts of size required for connecting posts to concrete foundations.

C. Pylon Fabrication: Fabricate pylon signs with integral base consisting of channels, angles, plates, or other fittings. Design and fabricate pylon and anchorage for structural performance indicated. Detail anchorage so that water can drain out of assembly without obstruction. Drill holes in members for anchor-bolt connection. Provide anchor bolts of size required for connecting base to concrete foundations.

1. Internal Frames: Manufacturer's standard internal steel framing system and anchorage, modified as required for Project requirements. Provide welded construction. Cut, drill, and tap units to receive hardware, bolts, and similar items.

a. Hot-dip galvanize steel framing system after fabrication according to ASTM A 123/A 123M.

2.8 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.

D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify that sign-support surfaces are within tolerances to accommodate signs.

C. Verify that anchorage devices embedded in permanent construction are correctly sized and located to accommodate signs.

D. Verify that electrical service is correctly sized and located to accommodate signs.

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

3.2 INSTALLATION

A. General: Install signs using installation methods indicated and according to manufacturer's written instructions.

1. Install signs level, plumb, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.

2. Install signs so they do not protrude or obstruct according to the accessibility standard.

3. Before installation, verify that sign components are clean and free of materials or debris that would impair installation.

4. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

3.3 INSTALLING POSTS

A. Vertical Tolerance: Set posts plumb within a tolerance of **1/16 inch in 3 feet (2 mm in 1 m)**.

B. Direct-Burial Method:

1. Excavation: Excavate posthole to dimensions indicated. Reconstruct subgrade that is not firm, undisturbed, or compacted soil, or that is damaged by freezing temperatures, frost, rain, accumulated water, or construction activities by excavating an additional **12 inches (300 mm)**, backfilling with satisfactory soil or well-graded aggregate, and compacting to original subgrade elevation.

2. Setting in Earth: Set post in position, support to prevent movement, and backfill with satisfactory soil or well-graded aggregate as recommended in writing by manufacturer. Place and compact backfill in 6-inch (150-mm) lifts, compacting each lift.

3. Setting in Cast-in-Place Concrete: Set post in position, support to prevent movement, and place concrete in posthole or for concrete foundation as indicated on Drawings.

4. Setting in Preformed Hole in Concrete Foundation: Form or core drill holes in concrete foundation not less than 3/4 inch (20 mm) larger than outside dimension of post for installing posts in concrete. Set post in position, shim to prevent movement, and fill annular space between post and hole with nonshrink, nonmetallic grout, mixed and placed to comply with manufacturer's written instructions.

C. Baseplate Method:

1. Preset Anchor Bolts: Set post baseplate in position over anchor bolts projecting from concrete foundation, shim and support post to prevent movement, place washers and nuts, and tighten. Fill shim space with nonshrink, nonmetallic grout, mixed and placed to comply with manufacturer's written instructions.

2. Drilled-in-Place Anchor Bolts: Set post baseplate in position over concrete foundation, locate and drill anchor holes, shim and support post to prevent movement, place washers and anchor bolts, and tighten. Fill shim space with nonshrink, nonmetallic grout, mixed and placed to comply with manufacturer's written instructions.

D. Sleeve Method: Set post in position in sleeve and support post to prevent movement, fill annular space between post and sleeve with nonshrink, nonmetallic grout, mixed and placed to comply with manufacturer's written instructions.

E. Reverse-Sleeve Method: Set post in position over the projecting insert and support post to prevent movement, drill posts and inserts for through bolts, and install and tighten through bolts.

3.4 INSTALLING PYLONS

A. Vertical Tolerance: Install pylons plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).

B. Attachment with Preset Anchor Bolts: Set pylon base in position over anchor bolts projecting from concrete foundation, shim and support pylon to prevent movement, place washers and nuts, and tighten. Fill shim space with nonshrink, nonmetallic grout, mixed and placed to comply with manufacturer's written instructions.

C. Attachment with Drilled-in-Place Anchor Bolts: Set pylon base in position over concrete foundation, locate and drill anchor holes, shim and support pylon to prevent movement, place washers and anchor bolts, and tighten. Fill shim space with nonshrink, nonmetallic grout, mixed and placed to comply with manufacturer's written instructions.

3.5 INSTALLING FIELD APPLIED, VINYL CHARACTER SIGNS

A. Field-Applied, Vinyl-Character Signs: Clean and dry substrate. Align sign characters in final position before removing release liner. Remove release liner in stages, and apply and firmly press characters into final position. Press from the middle outward to obtain good bond without blisters or fishmouths. Remove carrier film without disturbing applied vinyl film.

3.6 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.

C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION

PLAYGROUND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

B. Related Sections:

1. Section 03 3010 Portland Cement Concrete
2. Section 06 8200 Glass Fiber Reinforced Polymer
3. Section 31 2000 Earthwork
4. Section 11 6813 Playground Safety Surfacing
5. Section 31 3220 Geotextile Fabric
6. Section 32 1810 Playground Turf Surface
7. Section 32 9410 Engineered Wood Fiber
8. Section 33 4600 Subdrainage Systems

1.2 SCOPE

A. The work under this section of the specifications shall consist of furnishing all labor, materials and concrete foundations, to provide the Owner with complete and satisfactory playground equipment. These playgrounds shall be completed and ready for operation and shall include all items necessary for the proper use of the system, whether incorporated in this specification or not.

1.3 QUALITY ASSURANCE AND REFERENCE STANDARDS

A. All finished installations shall conform to all applicable current CPSC and ASTM guidelines.

B. Reference Standards: ASTM F1487-17

C. Playground equipment installer must be experienced in the installation of playground equipment, with at least 20 prior installations in the last 5 years. Preference may be given to installers who are qualified by the National Playground Contractors Association, Inc.

D. Manufacturer’s warranty shall apply for all play equipment.

E. A 3rd Party CPSI audit of playground equipment is to be performed after installation. Results of this audit are to be turned over to the Owner and Architect after punchlist, but before Substantial Completion.

1.4 SUBMITTALS

A. Manufacturer’s Literature: Furnish to Architect, when required, copies of manufacturer’s specifications, and installation instructions. Include photographs, catalogue cuts, samples as may be required to show compliance with these specifications.

B. Shop Drawings: Manufacturer shall submit shop drawings for type, location, quantity and details of components required for prefabricated buildings within this project.

1. Floor plan indicating walls, openings, surfaces, and size of framing members
2. Roof plan indicating walls, trusses, surfaces, and size of framing members

3. Elevations and Sections indicating surfaces, openings, trims, deck and railing configurations, framing, and hardware

PART 2 - PRODUCTS

2.1 PLAYGROUND MANUFACTURERS

A. The following are acceptable playground equipment manufacturers.

1.	Burke Company, LLC	800-356-2070
2.	Recreation Creations, Inc.	800-766-9458
3.	PlayWorld Systems	800-223-8404
4.	Landscape Structures, Inc.	888-752-9574
5.	Park Structures, Inc.	954-979-3535
6.	Miracle Recreation Equipment	800-523-4202
7.	GameTime	800-444-4654

2.2 PLAYGROUND EQUIPMENT – Appropriate for 2-5 year old children, ASD and EI

A. Dimensions of Playground Area: Maximize the capacity within the area depicted on the Site Plan.
B. User Capacity: 90-125
C. Colors: To be determined by Owner
D. The following is the playground equipment to be installed or an approved equal. Basis of design is Themed Concepts and BCI Burke Company, LLC.

2.3 PLAYGROUND EQUIPMENT

A. The following is the playground equipment to be installed or an approved equal.

ITEM DESCRIPTION	QUANTITY
Log Chip Hoppers: 1’x1’x8”	3
Rock Chip Hoppers: 2’x2’x8”	3
Log Tunnel: 6’x3’x3’	1
Fallen Branch: 4’x4’x6”	1
Full Steady Log: 6’x2’x1’	1
Frog Climber: 3’x3’x3’	1
Fossil Find: 2’x2’	1
Fossil Find: 2’-6”x2’-6”	2
48” Straight Slide w/ accessible platform from the sidewalk	1
5” Single Post Swing w/ 2 bays 1 belt, 2 bucket, & 1 inclusive swings	1
10’ Arched Bridge	1
ALTERNATE BID A-1:	
Large Play Structure: 37’-6”x26’ *Basis of Design Themed Concepts TL-122* Accessible Play 7 Elevated Components 5 Ground Components 6 Types of Play	1
ALTERNATE BID A-2:	
Beached Ship: 12’x8’x4’	1

B. The following is the Wood Playhouse to be installed or an approved equal.

ITEM DESCRIPTION

8'x8' Standard Pre-built Unit
2x4 wood wall framing
2x4 wood trusses 2' on center
Painted siding and trim – 2 colors to be selected by owner from manufacturers standard color options available
(2) 14'' x 21'' window openings with grids
Extended porch with deck and rail
Child's Dutch door (40'' high x 54'' wide)
Adult door on side (61'' high x 34'' wide)
Outside corner trim (aluminum)
Drip Edge
4x4 pressure treated skids
2x4 floor joists, 16'' O.C.
Wood Floor Panels
Hardware
25 year Shingles – color to be selected by owner from manufacturers standard color options available

2.4 SITE AMENITES

A. The following is the playground equipment to be installed or an approved equal.

ITEM DESCRIPTION	QUANTITY
6' Recycled Plastic Bench (wood look)	5
Single post, 8' square shade canopy	3
Single post, 12' square shade canopy	1
Single post, 15' square shade canopy	1
ALTERNATE BID A-3:	
Square Picnic Table - Recycled Plastic (wood look)	2
Toddler Picnic Table - Recycled Plastic (wood look)	2
ALTERNATE BID A-4:	
Storage Shed: 10'X10' Pre-built Unit	2

2x4 wood wall framing
2x4 wood trusses 2' on center
Painted fiber cement siding and trim – 2 colors to be selected by owner from manufacturers standard color options available
(2) operable 18'' x 24'' windows with safety glass and screens
5' Double door
Drip Edge
4x4 pressure treated skids
2x4 floor joists, 16'' O.C.
Wood Floor Panels
Hardware
25 year Shingles – color to be selected by owner from manufacturers standard color options available

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install as per manufacturer's installation instructions.

B. Installer shall provide onsite instructional meeting with the Owner and their selected representatives for playground use and maintenance per ASTM F1487-17 Section 13.1.

3.2 GENERAL CLEAN-UP AND DISPOSAL

A. Remove from the site all equipment, materials, and debris resulting from construction work including this section. Leave work area clean and in a condition acceptable by the Landscape Architect and Troy School District. All work shall be complete, ready for use, at the time of final acceptance.

END OF SECTION

PLAYGROUND SAFETY SURFACING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

B. Related Sections

1. Section 03 3000 Cast In Place Concrete
2. Section 31 3222 Geotextile Fabric

1.2 SCOPE

A. The work under this section of the specifications shall consist of furnishing all materials, labor, tools and equipment for the installation of the poured-in-place resilient playground surfacing. It is the primary intent of the specification to provide a seamless, porous safety surface (No rolled or pre-manufactured tiles will be accepted).

1.3 QUALITY ASSURANCE

A. Manufacturer shall have completed a minimum of twenty-five (25) surfacing projects, with the same product, in the last 10 years. Provide to the Architect, when requested, a list of references of similar scope, that are a minimum of 5 years old. The twenty-five projects shall have been contracted and installed by the company bidding the job.

B. All CPSC guidelines must be achieved.

C. All appropriate ASTM standards must be achieved.

D. All ADA requirements must be met.

E. Reference Standards: ASTM F1292-17, ASTM F2223-15

F. Post-installation Impact Attenuation testing must be completed by a qualified 3rd Party following guidelines outlined in ASTM F1292-17a. Results to be turned over to the Owner and Architect.

1.4 SUBMITTALS

A. Submit with bid, all manufacturer's literature, specification data and MSDS sheets.

B. Submit with bid, ASTM F1292 Impact Attenuation Test Certification for the poured-in-place system to be installed in compliance with the Critical Fall Height as determined by the Playground Equipment to be installed in conjunction with the poured-in-place surfacing system.

C. Submit with bid, ASTM E108 Fire Test results. (Product shall exhibit a minimum result of a Class A Rating.)

D. Submit with bid, results of ASTM E303 Skid Resistant Test Data

E. Submit with bid, Statement of Warranty for a minimum 5 year period with detailed Warranty Claim requirements of the owner and specific procedures to be followed by the manufacturer in terms of response and repair of warranty claims.

F. Submit with bid, a sample measuring 12” x 12” x 3” thickness of proposed surface.

1.5 SURFACE INSTALLER SHALL BE RESPONSIBLE FOR:

A. Protection of surface until fully cured.

B. All material used shall be handled, shipped and installed as outlined in the Material Safety Data Sheets and according to current OSHA Standards.

C. Disposal of all products as per current EPA Regulations.

D. Submission of an affidavit acknowledging each crew member, to be assigned to this project has read the Material Safety Data Sheets and is familiar with all safety procedures and the proper handling of all materials.

E. Submission of the Material Safety Data Sheets prior to the material arrival. Submission shall be in triplicate and the job superintendent shall maintain a copy on the site at all times.

1.6 TESTING

A. The installation Contractor will be responsible for all tests that fail the above standards. The Owner reserves the right to submit the surface to the above tests at any time during the length of the guarantee. Consideration will be given to the time and use of the surface.

B. The Owner shall reserve the right to submit the surface to the following tests to determine the surface performance. Any section of the surface that is found to be unacceptable by any aforementioned standard shall be removed and replaced in a proper workmanship-like manner.

C. The sample size shall be approximately one (1) square foot. The samples shall be taken for testing and not replaced. A sample shall be taken for every four thousand (4,000) square feet. If the surface is acceptable, the Owner will accept the responsibility of the testing cost and the replacement cost for surface areas.

PART 2 - PRODUCTS

2.1 SURFACING MANUFACTURERS

A. The following surfacing systems are acceptable:

1. SPECTRAPOUR, by Spectraturf, Inc.
   310 Reed Circle
   Corona, CA 91719
   800-875-5788

2. SAF DEK, by No Fault Industries, Inc.
   11325 Pennywood Ave.
   Baton Rouge, LA 70809
   800-232-7766

3. PLAYBOUND, by Surface America
   P.O. Box 157
   Williamsville, NY 14231
   800-999-0555

2.2 MATERIALS

A. Polyurethane Binder: 100% MDI based polyurethane binding agent.

B. Impact/Cushion Course: shall be a mixture of SBR and EDPM rubber bonded by a polyurethane binder applied to 100% of the rubber and installed to the thickness designated on the plans.

C. Wearing Course: shall be a mixture of black and colored EDPM granules bonded by a polyurethane binder applied to 100% of the granules and applied to a thickness designated on the plans. Final colors shall be approved by Owner. STRAND, SHAVED, CHIPPED OR SHREDDED RUBBER IS NOT ACCEPTABLE IN THE WEARING COURSE.

PART 3 - EXECUTION

3.1 BASE REQUIREMENTS

A. The base shall have the specific minimum slope and shall vary no more than ¼" when measured in any direction with a 10' straight edge.

B. The surface installer shall supply and install a geotextile fabric on compacted stone base.

3.2 PREPARATION

A. The entire surface shall be clean and free from any foreign and loose materials.

B. The binder/rubber mixture shall not be applied within twelve (12) hours after a rainfall nor with the forecast of rain within twenty-four (24) hours. In the event of showers or rainfall, the placed surface shall be first covered with burlap and then visqueen for total protection.

C. No solvents or emulsifier agents shall be used in the binding to extend the curing of the mixture. The contractor shall submit all shipment documents and proper material volumes.

D. Each layer shall be allowed to cure for approximately 12 hours in warm, dry ambient temperatures.

3.3 INSTALLATION

A. Total depth of surface shall be 3", as detailed in plans.

B. Cushion course must be composed of recycled rubber and be free of foreign matter. The cushion course will then be poured in place by means of screeding and hand-trowelled to maintain a seamless application. All rubber in the cushion course will be of a select quality and consistent blend of recycled rubber to achieve maximum porosity and minimum residue. Rubber quality and sizings will be reviewed during the submittal process.

C. Wearing course shall be composed of EDPM rubber granules only. The course will be poured in place by means of screeding and hand-trowelled to maintain a seamless application. All rubber shall remain consistent in gradation and size. Color tinted binder will not be allowed.

D. Edges shall be flush with edge of timber, to provide a safe transition. Surface shall be sloped to drain as indicated on plans.

3.4 PROTECTION OF SURFACE

A. Surface installer shall be responsible for the protection of the surface until fully cured.

3.5 FINAL ACCEPTANCE:

1. At the completion of the project, Contractor shall provide the following:

    a. Certificate of Substantial Completion.
    b. Impact Attenuation test results.
    c. Warranty: Submit warranty and ensure forms have been completed in Owner's name and registered with Manufacturer.
    d. 5 complete sets of Maintenance Manuals, which will include necessary instructions for the proper care and preventative maintenance of the synthetic turf system, including line/marking installation and removal, small repair procedures and cleaning.
    e. List of procedures required to maintain surface condition and activities to be avoided in order to prolong the life and maintain the warranty, including static and dynamic load limits, snow clearing, etc.

2. Installer shall provide training session for Owner and their selected representatives.

END OF SECTION

EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the provisions of the other parts.

1.2 SCOPE

A. The work under this section of the specifications shall consist of furnishing all labor, materials, equipment, transportation, and services required to complete all earthwork as indicated on the drawings and specified herein. Adjustment of grades may be permitted, subject to prior approval by the Landscape Architect, providing the overall grading concept is maintained.

1.2 QUALITY ASSURANCE

A. Excavation team shall be established and experienced with a minimum of 5 years experience constructing athletic fields.

1.3 ENVIRONMENTAL REQUIREMENTS

A. The contractor is expected to visit the site to determine all conditions to be encountered, protect improvements on adjoining properties, as well as those on the owner's property, and to restore any improvements damaged by his work to their original condition, as acceptable to the owner or other parties or authorities having jurisdiction.

B. The contractor shall perform all work so as to permit the site to be free draining at all times and to prevent ponding. Contractor shall provide positive drainage for the entire site during the course of construction to eliminate standing water in excavated areas.

1.4 SAFETY CODES AND STANDARDS

A. Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

1.5 LINES AND GRADES

A. The plans indicate lines, grades and elevations of the finish work. In general, areas to be paved shall be excavated and/or filled, and graded to the bottom elevations of such pavements. Grass areas shall be finish graded prior to seeding. Sod/seed areas shall be rough graded to 2" below finish grade prior to placement of topsoil.

1.8 PROTECTION OF EXISTING TREES & VEGETATION

A. Protect existing trees, and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stock piling construction materials or excavated materials within drip line, excess foot or vehicle traffic, or parking of vehicles within drip line. Provide temporary fences, barricades or guards as required to protect trees and vegetation to be left standing. Provide protection for roots over 1.5 inches in diameter that are cut during construction operations. Coat the cut faces with emulsified asphalt or other acceptable coating that is specially formulated for horticultural use on cut or damaged plant tissues. Temporarily cover all exposed roots with wet burlap to prevent roots from drying out, provide earth cover as soon

as possible. Repair or replace trees and vegetation damaged by construction operations in a manner acceptable to the Landscape Architect. Tree damage repair shall be performed by a qualified tree surgeon.

PART 2 - PRODUCTS

2.1 BACKFILL AND FILL MATERIALS

A. Backfill shall be excavated soil material, free of rock or gravel larger than 2" in any dimension, debris, waste, frozen materials, vegetable matter, and other deleterious matter. Existing materials may be used for backfill, provided no silt is mixed with material. Backfill consists of placement of acceptable soil material in layers, in excavations, to required subgrade elevation, for each area classification listed below.

B. Fill Material: Fill material shall be clean, hard, durable, uncoated particles of sand or sand gravel mixture, provided that there shall be a substantial excess of sand-screenings.

2.2 TOPSOIL

A. Existing onsite topsoil shall be screened and free of rock or gravel larger than 1” in any dimension, debris, waste, frozen materials, vegetable matter and other deleterious matter.

B. Topsoil to have 5% organic peat content.

C. Blend sand with screened topsoil to create a loamy-sand product.

PART 3 - EXECUTION

3.1 EXCAVATION

A. Excavation consists of removal of material encountered to obtain required subgrade elevations.

1. Excavation for Ditches: Cut ditches to cross-sections and grades as shown. Deposit excavated materials a sufficient distance from the edge of ditches to prevent cave-ins or material from sliding into ditch. Keep ditches free of leaves, sticks, and other debris until final acceptance of work.
2. Removal of Unsatisfactory Soil Materials: Excavate unsatisfactory soil materials encountered that extend below required elevations, to additional depth directed by the Geotechnical Engineer and reviewed with Landscape Architect; refer to geotechnical evaluation report.
3. Material Storage: Place excavated materials classified as unsatisfactory fill materials where directed by Owner's geotechnical consultant.
4. Stability: Slope sides of excavations over five feet (5') deep to angle of repose of material excavated; otherwise shore and brace where sloping is not possible either because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in a safe condition until completion of backfill by scaling, benching, shelving, or bracing. Take precautions to prevent slides or cave-ins when excavations are made in locations adjacent to backfill excavations, and when sides of excavations are subjected to vibrations from vehicular traffic or the operation of machinery or any other source. Stabilize earth subgrades under areas of paving and after excavating, but prior to filling, by discing four inches (4") deep and by compacting same as specified for fills. Remove soft or unstable soil below finish grade elevations and backfill such voids with compacted fill material.

3.3 BACKFILL AND FILL MATERIALS

A. Surface Preparation

1. Remove vegetation, debris, unsatisfactory soil materials, obstruction and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break up sloped surfaces steeper than one (1) vertical to four (4) horizontal so that fill material will bond with existing surface. When the existing ground surface has a density less than that specified under "Compaction" (3.2 A 2) for the particular area classification, break up ground surface, pulverize, and compact to the required depth and percentage of maximum density.
2. Compaction: Perform compaction of soil materials for fills and backfills using suitable soil compaction equipment for materials to be compacted and work area locations. Control soil compaction during construction for compliance with percentages of maximum density specified for each classification. All compaction tests shall be in accordance with ASTM D1557 or AASHO T180 C Modified Proctor Method.
3. Placement And Compaction: Place backfill materials in layers not more than eight inches (8") in loose depth. Before compaction, moisten or aerate each layer, as necessary, to provide the optimum moisture content. Compact each layer to required percentage of maximum density for each area classification. Do not place backfill or fill material on surfaces that are muddy, or frozen, or contain frost or ice. Thoroughly compact all fill and backfill by rolling each layer, following spreading, as closely as possible. Roll the areas in equal amounts in two directions. Provide compaction equipment or type best suited to achieve the desired results with the type of soil. In general, use sheeps foot and/or tamping type rollers on soils of a cohesive type; pneumatic wheeled or vibrating rollers on granular fill material, all as approved by the Landscape Architect. Operate compacting equipment on each layer until the entire area has been thoroughly and uniformly compacted to the required density.
4. Maximum Density Requirements: Provide not less than the following percentages of maximum density of the same soil material compacted at optimum moisture content, for the actual density of each layer of soil material in place. Any soils found unsuitable for specified compaction requirements shall be removed as directed by Owner.
5. Lawn or Unpaved Areas: Compact top six inches (6") of subgrade and each layer of backfill or fill material at eighty-five percent (85%) maximum density.
6. Grading: Preparation of subgrade: Rough grade all areas within the limits of site grading under this section, including adjacent transition areas. The rough grade shall be compacted as required. Shape the surface of future lawn areas to the line grade and cross-section with the surface not more than 0.10 feet above or below a subgrade elevation. Take extreme care in the grading of swale areas to insure free movement of surface runoff. Ponding shall be non-existent or at a minimum.

3.4 FINISH GRADING

A. Sub-Soil Preparation

1. Fine grade sub-soil systematically to eliminate uneven areas and low spots. Remove debris, roots, branches, stones, etc., in excess of two inches (2") in size. Remove sub-soil which has been contaminated with petroleum products.

2. Bring sub-soil to required levels, profiles and contours suitable for receiving the required finish surfaces. Make changes in grade gradual; blend slopes into level areas. Maximum slope 4:1 unless otherwise indicated.

3. Cultivate sub-grade to a depth of six inches (6") where topsoil is to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted sub-soil.

4. Compact sub-soil at the following percentages to a depth of 12 inches:

a. 95% Modified Proctor where asphalt/concrete is to be placed.
b. 80% Modified Proctor where topsoil is to be placed.

B. Placing Topsoil

1. Place to the following depths, up to finished grade elevations:

a. Four inches (4”) for sodded and seeded areas
b. Use topsoil in relatively dry state. Place during dry weather.
c. Fine grade topsoil eliminating rough and low areas to ensure positive drainage. Maintain levels, profiles, and contours of finish grades shown on the plans.
d. Topsoil shall be worked to a smooth, uniform surface and compacted firmly. Any lumps or depressions which occur shall be regraded and re-rolled until a satisfactory grade is obtained. Areas adjacent to existing lawn shall be notched so new sod will be at the same grade. Immediately before seeding or sodding, rework the surface until it is fine, pulverized smooth seed or sod bed, varying not more than 1/8” in 10’.
e. Remove all stones, roots, grass, weeds, debris, and other foreign material while spreading.
f. Manually spread topsoil around trees, plants and buildings to prevent damage which may be caused by grading equipment.
g. Compact placed topsoil to 85% Modified Proctor.

END OF SECTION

EARTHWORK - TURF

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the provisions of the other parts.

B. Section Includes:

1. Excavation
2. Grading
3. Backfill and Fill

1.2 SCOPE

A. Furnish approved labor, materials, equipment, transportation, and services required to complete all earthwork as indicated on the drawings and specified herein The Base Bid includes all earthwork and grading to provide a subgrade for other improvements. Adjustment of grades will be permitted, providing the overall grading concept and the positive drainage swales are maintained.

1.3 QUALITY ASSURANCE

A. Excavation team shall be established and experienced with a minimum of 5 years experience constructing athletic fields.

1.4 EXAMINATION OF SITE

A. The contractor is expected to visit the site to determine all conditions to be encountered, protect improvements on adjoining properties, as well as those on the owner's property, and to restore any improvements damaged by his work to their original condition, as acceptable to the owner or other parties or authorities having jurisdiction.

1.5 SAFETY CODES AND STANDARDS

A. Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

1.6 LINES AND GRADES

A. The plans indicate lines, grades and elevations of the finish work. In general, areas to be turfed shall be excavated and/or filled, and graded to the bottom elevations of drainage aggregate.

1.7 DEWATERING

A. The contractor shall perform all work so as to permit the site to be free draining at all times and to prevent ponding. Contractor shall provide positive drainage for the entire site during the course of construction to eliminate standing water in excavated areas.

1.8 DEBRIS

A. All debris is to be disposed off Owner's property unless otherwise directed.

B. Debris may not be buried over existing sewers or water mains.

C. All debris must be removed on a daily basis.

PART 2 - PRODUCTS

2.1 BACKFILL AND FILL MATERIALS

A. Backfill shall be excavated soil material, free of rock or gravel larger than 2" in any dimension, debris, waste, frozen materials, vegetable matter, organic matter, and other deleterious matter. Existing materials may be used for backfill, provided no silt is mixed with material. Backfill consists of placement of acceptable soil material in layers, in excavations, to required subgrade elevation, for each area classification listed below.

B. Fill Material: Fill material shall be clean, hard, durable, uncoated particles of sand or sand gravel mixture, provided that there shall be a substantial excess of sand-screenings.

PART 3 - EXECUTION

3.1 EXCAVATION

A. Excavation consists of removal of material encountered to obtain required subgrade elevations.

1. Excavation for Trench: Cut trench to cross-sections and grades as shown. Deposit excavated materials a sufficient distance from the edge of trench to prevent cave-ins or material from sliding into ditch. Keep trench free of leaves, sticks, and other debris until final acceptance of work.
2. Removal of Unsatisfactory Soil Materials: Excavate unsatisfactory soil materials encountered that extend below required elevations, to additional depth directed by the Geotechnical Engineer and reviewed with Landscape Architect; refer to geotechnical evaluation report. All organic matter within the synthetic turf footprint shall be removed.
3. Material Storage: Place excavated materials classified as unsatisfactory fill materials where directed by Owner's geotechnical consultant.
4. Stability: Slope sides of excavations over five feet (5') deep to angle of repose of material excavated; otherwise shore and brace where sloping is not possible either because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in a safe condition until completion of backfill by scaling, benching, shelving, or bracing. Take precautions to prevent slides or cave-ins when excavations are made in locations adjacent to backfill excavations, and when sides of excavations are subjected to vibrations from vehicular traffic or the operation of machinery or any other source. Remove soft or unstable soil below finish grade elevations and backfill such voids with compacted fill material.

3.3 BACKFILL AND FILL MATERIALS

A. Surface Preparation

1. Remove vegetation, debris, unsatisfactory soil materials, obstruction and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break up sloped surfaces steeper than one (1) vertical to four (4) horizontal so that fill material will bond with existing surface. When the existing ground surface has a density less than that specified under "Compaction" (3.2 A 2) for the particular

area classification, break up ground surface, pulverize, and compact to the required depth and percentage of maximum density.

2. Compaction: Perform compaction of soil materials for fills and backfills using suitable soil compaction equipment for materials to be compacted and work area locations. Control soil compaction during construction for compliance with percentages of maximum density specified for each classification. All compaction tests shall be in accordance with ASTM D1557 or AASHO T180 C Modified Proctor Method.
3. Placement And Compaction: Place backfill materials in layers not more than eight inches (8") in loose depth. Before compaction, moisten or aerate each layer, as necessary, to provide the optimum moisture content. Compact each layer to required percentage of maximum density for each area classification. Do not place backfill or fill material on surfaces that are muddy, or frozen, or contain frost or ice. Thoroughly compact all fill and backfill by rolling each layer, following spreading, as closely as possible. Roll the areas in equal amounts in two directions. Provide compaction equipment or type best suited to achieve the desired results with the type of soil. In general, use sheeps foot and/or tamping type rollers on soils of a cohesive type; pneumatic wheeled or vibrating rollers on granular fill material, all as approved by the Landscape Architect. Operate compacting equipment on each layer until the entire area has been thoroughly and uniformly compacted to the required density.
4. Maximum Density Requirements: Provide not less than the following percentages of maximum density of the same soil material compacted at optimum moisture content, for the actual density of each layer of soil material in place. Any soils found unsuitable for specified compaction requirements shall be removed as directed by Owner.
5. Lawn or Unpaved Areas: Compact top six inches (6") of subgrade and each layer of backfill or fill material at eighty-five percent (85%) maximum density.
6. Grading: Preparation of subgrade: Rough grade all areas within the limits of site grading under this section, including adjacent transition areas. The rough grade shall be compacted as required. Shape the surface of future lawn areas to the line grade and cross-section with the surface not more than 0.10 feet above or below a subgrade elevation. Take extreme care in the grading of swale areas to insure free movement of surface runoff. Ponding shall be non-existent or at a minimum.

3.4 FINISH GRADING:

A. Sub-Soil Preparation:

1. Fine grade sub-soil systematically to eliminate uneven areas and low spots. Remove debris, roots, branches, stones, etc., in excess of two inches (2") in size. Remove sub-soil which has been contaminated with petroleum products.
2. Bring sub-soil to required levels, profiles and contours suitable for receiving the required finish surfaces. Make changes in grade gradual; blend slopes into level areas. Maximum slope 4:1 unless otherwise indicated.
3. Cultivate sub-grade to a depth of six inches (6") where topsoil is to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted sub-soil.
4. Compact sub-soil at the following percentages to a depth of 12 inches:
   a 85% Modified Proctor where topsoil is to be placed.

END OF SECTION

GEOTEXTILE FABRIC

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

1.2 SCOPE

A. The work under this section shall consist of furnishing all labor, materials and equipment for the installation of the geotextile fabric.

1.3 SUBMITTALS

A. Manufacturer's Literature: Furnish to Landscape Architect, when required, copies of manufacturer's specifications, and installation instructions for geotextile fabric. Include photographs, catalogue cuts, samples as may be required to show compliance with these specifications.

PART 2 - PRODUCT

2.1 GEOTEXTILE FABRIC

A. The product shall be AMOCO CEF2006, Mirafi - 600x, LINQ Industrial Fabrics - GTF-300, CSI Geoturf - W315 or an approved equivalent.

B. The geotextile shall be of woven construction and consist of long-chain polymeric yarns. The yarns must be composed of at least 95% propylene or ester polymers. The fibers shall be produced in a manner which achieves a stable network. The geotextile shall conform to the mechanical and hydraulic property requirements listed below:

MINIMUM AVERAGE

PROPERTY	VALUE	UNIT	TEST PROCEDURE
Grab Tensile Strength	315	lbs.	ASTM D-4632
Grab Tensile Elongation	15	%	ASTM D4632
Wide Width Tensile	175/175	lbs/in	ASTM D4595
Wide Width Elongation	15/8	%	ASTM D4595
Mullen Burst	600	Psi	ASTM D3786
Puncture	145	lbs	ASTM D4833
Trapezoidal Tear	120	lbs	ASTM D4533
UV Resistance	70	% @ 500 hr	ASTM D4355
Apparent Opening Size (max)	40	AOS	ASTM D4751
Permitivity	.055	1/sec	ASTM D4491
Flow Rate	4.0	gpm/ft2	ASTM D4491

PART 3 - EXECUTION

3.1 INSTALLATION

A. The geotextile fabric shall be furnished and stored in a wrap which will protect the geotextile fabric from ultraviolet radiation and abrasion. The geotextile fabric shall be covered with the appropriate soil cover within two weeks of its placement.

B. Should the geotextile fabric be damaged during construction, the torn or punctured section shall be repaired by placing a piece of fabric that is sufficiently large enough to cover the damaged area plus two feet (2') of adjacent undamaged geotextile fabric in all directions.

C. Fabric shall be installed on dry soil as per manufacturer.

D. Overlap the fabric as recommended by the manufacturer.

E. Installation and Unit Price shall include overlap quantities.

END OF SECTION

AGGREGATE DRAINAGE LAYER

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

B. Related Sections:

1. Section 31 2010 Earthwork – Turf

1.2 SCOPE

A. The work under this section of the specification shall consist of furnishing all labor, materials and equipment to produce, place, spread, compact and finish to proper grade and cross section all aggregate base courses according to the drawings and specifications.

1.3 QUALITY ASSURANCE

A. Contractor shall have previously installed twelve (12) artificial turf bases in the last three (3) years.

1. The contractor is responsible for subgrade fine grading, installation of geotextile fabric, installation of drainage system, installation of the perimeter nailing system, and installation of the dynamic stone base.

B. Firms must have been in business under the same ownership for at least five (5) years, and shall have been installing similar sports fields for that entire period.

C. Contractor shall provide a sieve analysis prior to placement for every 150 ton of stone delivered to site.

D. The synthetic turf manufacturer/installer shall perform an inspection of the field base onto which the synthetic turf system is to be installed to examine the finished surface for required compaction, permeability and grade tolerances. Earthwork contractor is responsible for correcting deficient items noted by the turf manufacturer/installer prior to acceptance. The turf installer will accept the aggregate stone base in writing when the Owner's representative provides test results for compaction, permeability and planarity that are in compliance with the project plans and specifications. After any discrepancies between the required materials, application and tolerance requirements noted have been corrected, the synthetic turf installer should submit a written certification of acceptance of the base for installation of synthetic turf system.

1.4 SUBMITTALS

A. Submit to the Landscape Architect a sieve analysis of the proposed stone to be installed. Sieve analysis shall be dated within 14 days of submission.

1.5 ACCEPTABILITY OF THE WORK

A. Grade: Grade conformance tests shall be conducted on the entire surface. The surface shall have positive drainage of 0.50% inclination.

B. Planarity: After completion of the compacting operations, the compacted aggregate base shall be tested with a 10' straightedge. Measurements shall be made perpendicular to and across the field at a distance not to exceed 25' feet. The grade will not vary by 1/8" from proposed grades, elevations and slopes provided.

C. The grade of the aggregate base shall be evaluated with a “string test”.

D. Aggregate shall be tested as per ASTM F1551-09 at a minimum of 3 locations after final grade as been achieved and accepted.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aggregate base material shall conform to specifications for 100% crushed 100% limestone and shall be placed and compacted to the minimum depth shown on plans. Crushed concrete, slag, etc. shall not be allowed. DOT standard classifications do not conform. Modifications of standard DOT aggregate classification maybe required to meet specification. On-site mixing will not be an acceptable method for providing this material.

Aggregate Sieve Analysis	Percent Passing	
	Base Material	Finishing Stone (Not to exceed 1” compacted depth)
1 1/2"	90-100	
1"	75-100	
¾”	65-95	100
3/8”	40-75	85-100
¼”	25-65	75-100
No. 4	15-60	60-90
No. 8	0-40	35-75
No. 16	0-20	10-55
No. 30	0-7	0-40
No. 60	0-5	0-15
No. 100	0-3	0-8
No. 200	0-2.5	0-2
LBW	Maximum 2.5	Maximum 2

B. The hydraulic conductivity of the aggregate shall be such that is capable of draining the entire synthetic surface at a minimum of 10”/hr for the carpet and 14”/hr including aggregate drainage stone with perforated under drain system acting as the main water displacement conductor. The aggregate shall maintain its finished grade elevations migration of fines and subsequent loss of finished tolerances will not be accepted.

C. Material shall be tested by a testing agency selected by the Owner to ensure compliance with the submitted documentation (ASTM D422 particle size analysis and ASTM F1551-09/DIN 18-035:6, permeability to water). A minimum of 8 tests shall be performed at random locations selected by Owner’s representative.

PART 3 - EXECUTION

3.1 SUB-GRADE CONSTRUCTION

A. The sub-grade shall be so constructed as to have uniform stability for a width at least equal to that of the proposed improvements plus of the proposed anchoring system. It shall be brought to an elevation and cross section such that, after being rolled, the surface will be at the required elevation. At the time the sub-grade is prepared, the fill area shall have been constructed to the full width and to at least the elevation of the finished sub-grade.

B. The material present in the next six (6) inches below the elevation of the sub-grade shall be scarified, mixed and recompacted, or otherwise treated to produce a uniform condition. Stones over four (4) inches in size shall be removed from the loosened portion of the sub-grade and disposed as directed by the project representative.

C. Depressions that develop during the following shall be filled with suitable material, and the rolling shall continue until the sub-grade is uniformly firm, properly shaped and substantially true to grade and cross section. It shall be so maintained until the pavement is place.

D. Material, other than sand, which will not compact readily under roller shall be removed and replaced with material which will compact readily and that portion of the sub-grade shall be rolled again.

E. The rolling of the sub-grade shall extend for at least twelve (12) inches outside of each edge of the proposed turf boundaries when possible. Piles or ridges of earth or material that would seriously interfere with the operations of finishing the pavement shall not be left on the shoulders.

F. During the process of construction sub-grade, the soil shall be maintained in a condition sufficiently moist to facilitate compaction and produce a firm, compact surface.

G. If, in the preparation of the sub-grade, it becomes necessary to excavate below the elevation of the earth shoulders, ditches or drains shall be provided at frequent intervals to permit ready drainage of surface water from sub-grade to side ditches.

H. If ruts or other objectionable irregularities form in the sub-grade during construction, the Contractor shall reshape and re-roll the sub-grade before the drainage course is laid. The material used for filling ruts or other depressions shall be of such character as to make it equally desirable for sub-grade purposes as the material presented in the sub-grade.

I. When the sub-grade is being prepared for placement as an aggregate base course, the elevation of the most finished surface, at the time the next layer is placed, shall not vary by more than 0.02 foot above or below the prescribed elevation at any point where measurement is made.

3.2 AGGREGATE DRAINAGE COURSE

A. Base course construction shall proceed as follows only after the Architect has approved the sub-grade construction and the gravel tests.

B. The base shall be constructed in layers of not more than three (3) inches (75mm) compacted thickness when conventional rolling equipment is used.

C. If vibratory or other approved special equipment is used, the thickness of every compacted layer may be increased to a maximum of six (6) inches.

D. The finished surface of any aggregate drainage layer shall not vary more than 1/8” from the elevations, grades and cross sections on the drawings.

E. Compacted stone base dimensions shall be a minimum of 6".

F. It shall be the contractor's responsibility to maintain a uniform consistent stone base gradation during the installation process. This shall include but not limited to keeping aggregate base at optimum moisture content (5%, ± 1%) and/ or providing, placing, and compacting a ½ " layer of stone chips.

G. Installation shall be accomplished using automated laser grade control, equipment, with dual-slope capabilities.

H. PK nails, or equivalent, shall be placed on turf nailer system. Do not set flush into nailer. Allow enough to loop grade line onto nail for grade verification. String Check.

I. Contractor shall have on-site, prior to Landscape Architect arrival, the following equipment:

1. One (1) ton steel drum rover – rubber tired equipment not acceptable.
2. 10 ton 3/8" stone chips.
3. Topdresser – to distribute 3/8" stone chips.
4. Two (2) 48"/38" aluminum landscape rakes.
5. 24" wide broom.
6. There must be enough personnel to operate all equipment simultaneously.

J. It will be the contractor's obligation and responsibility to have all of the above items in place prior to grade verification by Landscape Architect.

3.3 COMPACTION REQUIREMENTS

A. Sub-grade shall be compacted to not less than ninety-two percent (92%) of maximum density at not less than seventy-five percent (75%) of optimum moisture content.

B. Aggregate drainage layer shall be compacted to not less than eighty-five percent (85%) of maximum density. Using conventional rolling equipment, moisture content shall not be less than ninety percent (90%) nor more than one hundred-ten percent (110%) of optimum moisture content. Using vibrating equipment, moisture content shall not be less than seventy-five (75%) of optimum moisture content.

C. Maximum density shall be determined in accordance with AASHO Modified Method of Test for the Compaction and Density of Soil, Designation T-180, and the optimum moisture content shall be that corresponding to the maximum density in the above test.

D. Contractor shall maintain optimum moisture content during the installation, (placement, grading, compacting, etc.) of the aggregate base materials.

3.4 ROLLERS

A. Smooth steel-wheeled rollers shall be self-propelled and have a total weight not less than 8 tons. The compression (driving) roller shall exert a pressure of not less than 250 lbs. per inch width of the roller.

B. Pneumatic-tire rollers shall have a compacting width of sixty (60) inches (1.5m) or more and shall be capable of varying the weight from 100 to 250 lbs. per inch of rolling width.

END OF SECTION

SYNTHETIC TURF – PLAY STRUCTURE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents, including General and Supplementary Conditions. Drawings shall be coordinated with the applicable provisions of the other parts.

B. Related Sections:

1. Section 32 1123 Aggregate Drainage Layer

1.2 SYSTEM DESCRIPTION

A. Provide all labor, materials, equipment, and tools necessary for the complete installation of synthetic grass safety surface. The system shall consist of, but not necessarily be limited to, the following:

1. Synthetic grass consisting of fibers that are nominal 1 ¾". Turf fiber construction consisting of polyethylene monofilament and texturized thatch fibers tufted to a 2- layer stabilized woven polypropylene fabric (primary backing), with a secondary backing (stitch binder) of urethane or Duraflo.

2. Pad underlayment system consisting of porous closed cell composite materials. Thickness and density of panels shall be sufficient so that system meets the fall height requirements.

3. Synthetic Grass Infill, consisting of anti-microbial acrylic coated round silica particles, designed to provide the look, feel, and performance of optimally maintained natural grass.

B. Performance Requirements:

1. Shock Attenuation (ASTM F1292):

a. Gmax: Less than 200
b. Head Injury Criteria: Less than 1000
c. Flammability (ASTM D2859): Pass
d. Water Permeability: 130.32gal/min/sq yd
e. Accessibility: Comply with requirements of ASTM F1951

2. Post-installation Impact Attenuation testing must be completed by a qualified 3rd Party following guidelines outlined in ASTM F1292-17a. Results to be turned over to the Owner and Architect as part of close-out documents.

C. Work included in this Section includes grading necessary to shape and drain the area and base preparation and installation of the synthetic grass in areas shown on Drawings.

1.3 QUALITY ASSURANCE AND REFERENCE STANDARDS

A. Bidders shall submit a color roll of standard manufacturer colors with their bid.

B. Following acceptance of bids and evaluation of all product related information submitted with bid and requested additionally, the Owner reserves the right to award to the Contractor based on factors other than low bid.

C. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment

D. ASTM F1492 Standard Consumer Safety Performance Specification for Playground Equipment for Public Use

E. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.

F. ASTM F2223 Standard Guide for ASTM Standards on Playground Surfacing

G. Passes the Federal Flammability Standard DOC FF 1-70

H. All finished installations shall conform to all applicable current CPSC and ASTM guidelines.

I. Qualifications: Utilize an installer approved and trained by the manufacturer of the playground surfacing system, having experience with other projects of the scope and scale of the work described in this section.

J. Certifications: Certification by manufacturer that installer is an approved applicator of the playground surfacing system.

K. Post-installation Impact Attenuation testing must be completed by a qualified 3rd Party following guidelines outlined in ASTM F1292-17a. Results to be turned over to the Owner and Architect.

1.4 SUBMITTALS

A. All submittals shall be provided within 14 days after Notice to Proceed.

B. General: Submit listed submittals in accordance with Conditions of the Contract and Submittal Procedures Section.

C. Product Data: Submit manufacturer’s product data and installation instructions.

D. Verification Samples: Submit manufacturer’s standard verification samples of 6" x 9” minimum.

E. Quality Assurance/Control Submittals: Submit the following:

1. Certificate of qualifications of the playground surfacing installer.

F. Closeout Submittals: Submit the following:

1. Warranty documents specified herein.

1.5 DELIVERY, STORAGE & HANDLING

A. General: Comply with Product Requirement Section.

B. Delivery: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.

C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at a minimum temperature of 40 degrees F (4 degrees C) and a maximum temperature of 90 degrees F (32 degrees C).

1.6 PROJECT/SITE CONDITIONS

A. Environmental Requirements: Install surfacing system when minimum ambient temperature is 40 degrees F (1 degree C) and maximum ambient temperature is 90 degrees F (32 degrees C). Do not install in steady or heavy rain.

1.7 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: Refer to PART 4 - WARRANTY

PART 2 - PRODUCTS

2.1 MATERIALS - SYNTHETIC GRASS SAFETY SURFACE

A. Basis of Design: Burke Turf Elite – BCI Burke Company, LLC

B. Synthetic grass: 1 3/4 or 2 1/8 inch

1. Face Weight: 50 oz/sy
2. Face Yarn Type: Polyethylene
3. Yarn Size: 10800/7300
4. Pile Height: 1 3/4 inches
5. Color: Spring Green
6. Construction: Broadloom tufted
7. Stitch Rate 8 per 3 inches
8. Tufting Gauge: 1/4"
9. Primary Backing: Stabilized woven Polypropylene (double thickness)
10. Secondary Backing Urethane 20 oz.
11. Secondary Backing DuraFlo or Approved Equal: 10.0 oz/sy
12. Total Product Weight: Burke Turf™ Elite 68.7 oz/sy
13. Finished Roll Width 180" untrimmed

C. Pad Underlayment System: Pad Standard recycled, non contaminated, Post industrial cross-link, closed cell Polyethylene – polyolefin foam.

1. Pad Underlayment System:

a. Foam Type: Polyethylene – polyolefin
b. Bulk Density: 5.0-8.0 lb/cu ft
c. Effective Size 24 sq ft (net coverage)
d. Tensile Strength 34 - 36 psi

D. Synthetic Grass Infill : Coating: Priority acrylic, iron oxide and chromium oxide

1. Grain shape: Hardness: 6-8 Mohs
2. Curvature: 0.7+
3. Specific Gravity: 1.76 g/cm3

4. Bulk Density: 110 lb/cu ft
5. Uniform coefficient 1.10 to 1.40
6. Effective Size .84 – 1.68 mm
7. Blend rate of 3 1/2 lb per square foot.

E. Splicing Material: 1000 denier coated nylon 12” wide minimum.

F. Adhesive: Synthetic Turf Adhesive

PART 3 - EXECUTION

3.1 CERTIFICATION OF BASE CONSTRUCTION

A. GENERAL: A written “Certification of Acceptance of the Base Construction" is required from the artificial turf/surfacing system prior to proceeding with any installation work under this section of the specifications.

B. SCOPE: This certification shall include but not be limited to the acceptance of:

1. The base construction finish surface is completely acceptable for the application of work specified under this section.
2. The materials and method of installation for the aggregate stone base construction is in conformance with the manufacturer's current recommendations for the application of the turf to be installed under this section.
3. The aggregate stone base construction is totally suitable for work to proceed with the assurance that the final installation of the work under this section will result in a high quality athletic sub-base. In order to provide these assurances and the Certificate of Acceptance, the turf system installer shall cooperate and communicate fully, at all times, with the construction manager. This contractor shall inspect the base construction work and verify that conditions and tolerances required for application of the artificial turf system are being met and that the Owner’s representative has provided test results for compaction, porosity and planarity.
4. All discrepancies between the required materials, application and tolerance requirements noted by the installer shall be brought immediately to the attention of the Contractor and Landscape Architect. Failure to immediately inform the contractor and Landscape Architect of any prior work which does not meet the required specifications for installation of the artificial turf surfacing system shall be considered an acceptance by the installer of the non-conforming work. Any additional work later required to bring the base to acceptable conditions shall be preformed by this installer at no additional cost to the Owner. Any discrepancies in the prior work which does not meet the specifications and noted in writing to the Owner and Landscape Architect shall be preformed immediately at no additional cost to the Owner.

3.2 INSTALLATION OF THE TURF

A. GENERAL: All installation shall be done in strict accordance with the manufacturer's current printed installation instructions approved by the Landscape Architect.

B. REPLACEMENT: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Landscape Architect and at no additional cost to the Owner.

C. SYNTHETIC GRASS: Place turf and cut to fit configuration as shown on Drawings. Splice seams. All seams must be attached with splicing film/fabric and adhesive as approved by the manufacturer for this type of installation of their product.

D. INFILL: Apply layers of synthetic grass infill evenly with a spreader and broom the turf fibers with stiff bristle broom to stand fibers up and allow infill to settle into the bottom. Broom in infill approximately 3 1/2 pounds per square foot.

E. Anchoring/Edging: Edges of turf will be secured to ground with mechanical fasteners, stakes or edging.

D. BONDING OF MATERIAL SURFACES

1. The adhesive bonding of all system material components shall provide a permanent, tight, secure and hazard free playing surface.

E. WORK QUALITY: All seams shall be flat and tight, with no separation or fraying. Submit seaming procedures to Architect for review, prior to installation. Any deviations to the plans shall be brought to the attention of the Architect prior to installation, Seams that appear separated shall be corrected immediately.

3.3 CLEANING

A. Contractor shall be responsible for clean up on a daily basis of all materials utilized. Upon completion of installation, all surrounding areas, including turf area, shall be clean and in “play” condition.
B. Contractor shall utilize magnetic bar to remove any metal objects within the field prior to infill and after infill, before final acceptance.

C. All turf remnants of desirable size shall become property of the Owner. Contractor will be responsible to neatly place attic stock on pallets and deliver to a suitable location as directed by Owner.

PART 4 – WARRANTY

4.1 WARRANTY

A. Manufacturer 10 year limited product warranty on turf from the date of purchase. The product shall be free from defects in material and workmanship resulting in premature wear or color loss.

B. Supplier’s warranty excludes: any Product defect, damage or failure that is the direct result of Product abuse, misuse or negligent maintenance; and Product damage caused directly or indirectly by acts of third parties, including, without limitation, negligence of owner/operator, vandalism, machinery, animals, flood, chemical reaction, improper sub- surface preparation and/or installation, improper cleaning methods, and acts of God.

END OF SECTION

CHAINLINK FENCE - VINYL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

B. Related Sections:

1. Section 03 3010 Portland Cement Concrete

1.2 SCOPE

A. The work under this section of the specifications shall consist of furnishing all labor, materials and equipment necessary for a new black vinyl chainlink fence system as indicated herein and on the Contract Documents. Work shall include but not limited to footings, posts, fabric, rails, gates and all related hardware.

B. Furnishing and installation of black vinyl fencing.

1.3 QUALITY ASSURANCE AND WARRANTY GUARANTEE

A. American Society for Testing and Materials (ASTM):

1. ASTM A53 – Standard Specification for Pip, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
2. ASTM A90 – Standard Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
3. ASTM C94 – Standard Specification for Ready-Mixed Concrete
4. ASTM A153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
5. ASTM F626 – Standard Specification for Fence Fittings
6. ASTM F668 – Standard Specification for Polymer Coated Chainlink Fence Fabric
7. ASTM F900 – Standard Specification for Industrial and Commercial Swing Gates
8. ASTM F934 – Standard Practice for Standard Colors for Polymer Coated Chainklink
9. ASTM F1043 – Standard Specification for Strength and Protective Coatings on Steel Industrial Chainlink Fence Framework
10. ASTM F1083 – Standard Specification for Pipe, Hot-Dipped Zinc-Coted (Galvanzied) Welded, for Fence Structures

B. Weights and tolerances to conform to Federal Specification RR-F-191G dated January 25, 1974.

C. The Contractor and any Sub-Contractor hereunder guarantee their respective work against defective materials or workmanship for a period of one (1) year from the date of filing Certificate of Substantial Completion and as accepted by the Owner.

D. All material installed under this specification shall be subject to testing by the Owner. Any material so inspected and found to be not in strict conformance with this specification shall be promptly removed and replaced by the Contractor at his expense.

1.4 SUBMITTALS

A. Shop drawings showing plan layout, spacing of components, post foundation dimensions, hardware, gates and schedule of components.

B. Product Data: Submit product data on fabric pattern, posts, accessories, fittings and hardware.

C. Samples: Color selection for vinyl finishes. If requested, samples of materials (e.g., fabric, wires, and accessories).

D. Mill Certificates conforming to ASTM F1043 (06), Part 8.1.4 – Adhesion Testing

1. Test Results shall be provided before material is shipped to site.
2. Minimum (3) random tests for each post size specified.

E. At the request of the Architect, provide Material Certificates confirming product provided is Domestic pipe.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in the manufacturing of products specified in this section with a minimum of ten (10) years experience

B. Installer: Company specializing in performing work of this section with a minimum of five (5) years experienced. Must have a minimum of two in-house fence installation crews.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for chainlink fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver fence fabric and accessories in packed cartons or firmly tied rolls.

B. Identify each package with manufacturer’s name.

C. Store fence fabric and accessories in a secure and dry place.

1.8 WARRANTY

A. Special Warranty: Manufacturer’s standard form in which Installer agrees to repair or replace components of chainlink fences and gates that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, deterioration of metals, metal finishes, and other materials beyond normal weathering.
2. Warranty Period: 15 years from date of Substantial Completion

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Framework, posts, rails, fabric and fittings for chainlink fence system shall be domestic pipe manufactured and supplied by:

1. Merchants Metals – Color Bond Product:
Phone: (888) 260-1600

2.2 VINYL CLAD CHAINLINK FENCE

A. This specification covers chain link fabric made from galvanized steel wire which has been coated with polyvinyl chloride compound hereinafter designated as "vinyl." The base metal shall be steel of such quality and purity that, when drawn to the size of wire specified and coated with vinyl, the finished fencing shall be of uniform quality and have the properties and characteristics as prescribed in the specification. Wire used for the manufacture of this fabric shall be capable of being woven into fabric without the vinyl coating voiding, cracking or peeling. Vinyl shall be plasticized and thoroughly compounded.

B. Thermal Fused Vinyl: The thermally fused vinyl coated wire shall consist of vinyl thermally fused to primed zinc coated wire. The zinc coating shall be in accordance with ASTM A641, .30 oz. per square foot. The vinyl adhesion shall be greater than the cohesive strength of the vinyl material itself.

C. Physical Properties of Coating

1. Accelerated Aging: PVC coated wire from which the fabric is woven shall withstand exposure for 1000 hours without failure at a black panel temperature of 145°F, Type BH apparatus described in ASTM G155 shall be used for the test. The product shall be construed to have failed the test if:

a. The wire fails to withstand the Mandrel Bend Test described below.
b. Shrinkage of the PVC coating is greater than 1/16” per foot of wire.
c. There is a significant change in color or gloss of the PVC surface as determined by visual inspection.

2. Mandrel Bend Test: PVC coated wire when subjected to a single bend at -20°F around a mandrel no larger than ten times the diameter of the wire shall not exhibit breaks or cracks in the PVC coating. The Mandrel Bend Test shall be performed on an individual piece of wire removed from the fabric. This specimen may be any length of wire over 12“and shall include both bends and straight sections, but shall not include either twists or knuckles.

3. Color of Coatings:

Hue	Black
Tolerance	2.0 G
Value	3.02
Chroma	2.35

D. Workmanship: Vinyl coated chain link fabric shall be produced by methods recognized as good commercial practices. Careful inspection shall be made to determine the quality of vinyl coating. Coatings not free from pinholes, bubbles or voids, rough or blistered surfaces shall provide a basis for rejection. An apparent mismatch of color readily discernible by visual inspection shall be cause for rejection.

E. Weight of Zinc Coating: The weight of coating shall be determined on individual pieces of wire removed from the fabric. The specimens may be of any continuous length of 12 inches, but preferably about 24 inches long. The weight of coating shall be determined in accordance with tests for weight of coating described in ASTM A90. The weight of zinc coating shall be determined after removing the vinyl coating from the fabric.

2.3 VINYL CLAD FRAMEWORK

A. General: The framework consists of all line, corner, terminal posts, horizontal rails and gate frame materials which shall be coated with a polyvinyl chloride coating 10 to 12 mils in thickness over galvanized steel or aluminum. These surfaces shall be thermally fused to the metal surface with an appropriate sured primer. The PVC shall be plasticized and thoroughly compounded so that all pigments, stabilizers and other ingredients are fully dispersed.

B. Color of Framework: The color of framework shall match the fabric.

F. Fabric: The wire used in the vinyl coated fences shall possess a minimum breakload of 850 pounds. The coated size of the thermally fused vinyl fence wire shall be 9 gauge core, 8 gauge finish (Class 2B). Vinyl coated fabric shall be woven to form a 2" mesh. The size of mesh shall be determined by measuring the minimum clear distance between the wires forming the parallel sides of the mesh, measured in either direction. The tolerance in the size of mesh shall be +/- 1/8" inch. The thickness of the vinyl coating shall be 0.007".

C. Framework Materials: Framework materials shall be, before coating with PVC, either Type I Schedule 40 pipe with 1.8 ounce per square foot zinc coating before resin coating, or Type II pipe manufactured from steel conforming to the Standard Specification for Black and Hot-Dipped Zinc Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses, ASTM A53; or TYPE II pipe manufactured from steel conforming to ASTM A1011, Cold-Rolled, Electric welded and Triple Coated with 1.0 ounce, +/- 0.1 ounce zinc per square foot. The internal surface shall have corrosion protection by a zinc-rich based organic coating with 87% minimum zinc powder loading, with the capability of withstanding 350 hours when subjected to Salt Spray Test ASTM B117, with a 5% minimum Red Rust.

D. Line Posts: Shall be one of the following vinyl coated materials: Type I, 2.375“ O.D. round steel posts weighing 3.65 lbs. per lineal foot; or, alternately, Type II 2.375“ O.D. round steel pipe weighing 2.78 lbs. per foot or roll-formed "c" section posts measuring 2.25 inches by 1.70” weighing 2.73 lb. per lineal foot. Posts shall not be splice welded in such a manner that the weld appears above the grade line. The chain link fabric shall be tied to the line posts with vinyl coated clips or tie wires with a minimum steel diameter of 0.132” and spaced on 15” maximum centers.

E. Terminal and Gate Posts: Terminal and gate posts shall be one of the following vinyl coated materials: two and one-half inch (2 1/2") square tubing weighing 5.10 lbs per lineal foot, or alternately, Type I, 2.875” OD steel round posts weighing 3.66 lbs. per lineal foot, or Type II 2.875” OD steel round posts weighing 4.64 lbs per lineal foot. Posts shall not be splice welded in such a manner that the weld appears above the grade line.

F. Terminal and Gate Post Fittings: Terminal and gate post fittings, including tension bands, brace connections and top rail connections, shall be 14 gauge, hot-dipped galvanized, cold-rolled, carbon steel. Top rail, brace and truss bands shall not be less than ¾" wide, secured by 5/16" diameter carriage bolts. Tension bars shall not be less than 2" shorter than the nominal height of the fabric with which they are to be used. One tension bar shall be provided for each end and gate post, and two for each corner and pull post.

G. All fixed component parts such as post tops, bands, connectors, and rail ends shall be vinyl coated on visible surfaces of a color to match the fabric and framework. Non-visible portions of parts may be uncoated in the case of aluminum components. Non-visible portions of steel or iron components not vinyl coated must be coated with zinc as per ASTM A153. All hardware shall come vinyl coated or shall be coated in the field with a vinyl base compound after installation. Aerosol spray paint to match the color of vinyl fencing will not be accepted.

H. Top and Bottom Rail: Top and bottom rails (where applicable) shall be vinyl coated Type I, 1.660" O.D. round steel pipe weighing 2.27 lbs. per lineal foot, or Type II, 1.660" O.D. round steel pipe weighing 1.59 lbs. per lineal foot. An outside sleeve type coupling measuring not less than 6" in length shall be provided at each interval of twenty-one feet. The chain link fabric shall be tied to the rails at intervals of 24" with vinyl clad tie wires, 13 gauge for double wrap ties or 9 gauge for single wrap ties. Intermediate rails shall be fastened between posts with vinyl clad boulevard type connectors or bands and rail end caps. The terminal ends of all top, bottom, mid and bracing rails shall utilize boulevard hardware that prevents insects from gaining access into top rails.

I. Bottom Tension Wire: Bottom tension wire shall be No. 6 gauge galvanized steel coil, vinyl coated tension wire, high carbon or hard drawn, Class II, Aluminum Coated, fastened to the chain link fabric at intervals of twenty-four inches (24") with No. 11 gauge galvanized steel hog rings.

J. Brace Rail for Terminal and Gate Posts: Vinyl coated terminal and gate posts shall be strengthened and reinforced by vinyl coated braces meeting the same specifications as above. Braces shall be installed midway between top rail and court surface and extend from each terminal post to the first adjacent line post. Braces shall be securely fastened to posts by vinyl coated heavy pressed steel connections and also be trussed from line post back to terminal post with a 5/16" vinyl coated round truss rod complete with tightening turnbuckle.

K. Posts Spacing and Settings: Line and terminal posts shall be set in concrete foundations not less than 12" in diameter and not less than 42" in depth. The concrete shall have a design mix of 3500 PSI. Spacing of posts in the line of fence shall be uniform and no more than ten-feet (10') apart. The smaller side of a "C" post shall be touching the chain link fabric and all open slots shall be facing in the same direction.

L. Post Tops: Tops of line posts shall be of a vinyl coated steel or aluminum casting capable of providing a through passage for top rail. Terminal post tops shall be of a vinyl coated steel or aluminum casting and be designed so as to exclude all moisture from the terminal post. Post caps at terminal posts shall be securely fastened to prevent removal.

M. Gates: Gate openings shall not be less than 4 feet wide and constructed and hung as detailed on drawings. Frame shall be assembled from vinyl coated 2" square aluminum, alloy 6063-T6 or 6061-T6, weighing 0.940 lbs. per foot, Type I pipe weighing 2.72 lbs. per foot, or Type II, 1.90" O.D. round steel pip weighing 2.28 lbs. per foot. Gate frames shall be welded or alternately shall utilize corner fittings of compressed or riveted type. A diagonal truss rod not less than 5/16" diameter shall be used on frames utilizing corner fittings. Color or the gate frame materials shall match the fence framework and component parts.

1. Fabric matching the fence fabric shall be installed in the frame by means of tension bars and hook bolts or bands. Galvanized gate frame and gate post hinges shall be furnished of adequate strength for the gate size specified and to allow for a 180° swing. Gates shall be equipped with a positive strong arm latching device that will accommodate padlocking. A plunger rod, catch and semi-automatic outer catch shall be installed on drive gates so as to secure gates in an open position. Hinges, latches and catches shall be approved by the Landscape Architect.

N. Driven Post Caulk

1. Contractor is responsible to caulk around all driven fence posts.
2. Caulk shall be supplied from the following manufacturer:
    a. Sportmaster “Courtflex Crack Sealant”
       Phone: 800-395-7325
    b. Color: Neutral

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine areas and conditions, with Installer present, for compliance with requirements for a verified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.

1. Do not begin installation before final grading is completed unless permitted by Architect.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Stake locations of fence lines, gates and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks and property monuments.

3.2 INSTALLATION

A. All posts shall be set plumb and in accordance with the following table (unless specified otherwise):

1. Corner/Terminal and Bracing Post - General Fence

Fabric Height	Post Depth	Diameter of Foundation	Foundation Depth	Maximum Spacing
0’ - 6’-0”	36”	12” min	42”	10’-0”
6’-1” - 12’-0”	36”	12” min	42”	10’-0”

2. Line Post - Backstop

Backstop Height	Post Depth	Diameter of Foundation	Foundation Depth	Maximum Spacing
24’	48”	18” min	60”	Varies
30’	48”	18” min	60”	10’-0”

3. Line posts shall be pneumatically driven into the ground using the following chart*:

Fabric Height	Pipe Below Grade	Total Length of Post
4’	4’	8’
6’	5’	11’
8’	6’	14’
10’	7’	17’
12’	8’	20’

B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, 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 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.

D. Fence posts shall be installed with maximum 6 inches clear opening from end posts to buildings, fences, property lines or other structures.

E. Install gates level, plum and secure for full opening without interference. Attach hardware using tamper-resistant or concealed means. Adjust hardware for smooth operation and lubricate where necessary.

F. The fabric shall be installed on the court/playing side of posts. Bottom of fence fabric shall be 3/4" (+/-1/4") above the finished court surface. Fabric shall be furnished with selvage knuckled on both ends.

G. Top of concrete footing shall be left down and topped with surrounding pavings as detailed. Cold patch is not acceptable.

3.3 CLEAN UP AND DISPOSAL

A. Remove from the site all equipment, materials, and debris resulting from construction work including this section. Leave work area neat and clean and in a condition acceptable by the Landscape Architect, Owner. All work shall be complete, ready for use, at the time of final acceptance.

END OF SECTION

LIMESTONE RETAINING WALL

PART 1 - GENERAL

1.1 SUMMARY

A. The work covered by this section includes the furnishing of all labor, materials, equipment and incidentals for the design, inspection and construction of a modular concrete retaining wall including drainage system and reinforcement as shown on the Construction Drawings and as described by the Contract Specifications. The work included in this section consists of, but is not limited, to the following:

1. Design, inspection and certification by a registered professional engineer.
2. Excavation and foundation soil preparation.
3. Furnishing and placement of the levelling base.
4. Furnishing and placement of the drainage system.
5. Furnishing and placement of geotextiles.
6. Furnishing and placement of limestone retaining wall.
7. Furnishing and placement of geosynthetic reinforcement.
8. Furnishing and compaction of infill, drainage and retained soils.

B. Related Sections

1. Section 02 1000 Site Preparation
2. Section 31 2000 Earthwork

1.2 REFERENCE STANDARDS

A. Geotextile Filter

1. ASTM D 4751 - Standard Test Method for Apparent Opening Size

B. Geosynthetic Reinforcement

1. ASTM D 4595 - Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
2. ASTM D 5262 - Test Method for Evaluating the Unconfined Creep Behaviour of Geosynthetics.
3. GRI GG-1: Single Rib Geogrid Tensile Strength
4. GRI GG-5: Geogrid Pullout
5. GRI GT-6: Geotextile Pullout

C. Soils

1. ASTM D 698 - Moisture Density Relationship for Soils, Standard Method
2. ASTM D 422 - Gradation of Soils
3. ASTM D 424 - Atterberg Limits of Soils
4. ASTM D G51 - Soil Ph

D. Drainage Pipe

1. ASTM D 3034 - Specification for Polyvinyl Chloride (PVC) Plastic Pipe
2. ASTM D 1248 - Specification for Corrugated Plastic Pipe

G. Where specifications and reference documents conflict, the Owner or Owner's Representative shall make the final determination of applicable document.

1.4 THE CONTRACTOR

A. The term Contractor shall refer to the individual or firm who will be installing the retaining wall.

B. The Contractor must have the necessary experience for the project and have successfully completed projects of similar scope and size.

1.5 DELIVERY, MATERIAL HANDLING AND STORAGE

A. The installing contractor shall check all materials delivered to the site to ensure that the correct materials have been received and are in good condition.

B. The Contractor shall store and handle all materials in accordance with supplier's recommendations and in a manner to prevent deterioration or damage due to moisture, temperature changes, contaminants, breaking, chipping or other causes.

1.6 ENGINEERING DESIGN AND CERTIFICATION

A. The term Engineer shall refer to the individual or firm who has been retained by the Contractor to provide design and inspection services for the retaining wall. The Engineer must be qualified in the area of retaining wall design and construction and must be licensed to practice engineering in the Province or State that the wall is to be constructed.

B. The Engineer will perform the following tasks:

1. Produce sealed construction drawings and detailed design calculations, completed in accordance with the design requirements outlined in Part 3 of these specifications.
2. Review the site soil and geometric conditions to ensure the designed wall is compatible with the site prior to construction.
3. Inspect the site conditions, materials incorporated into the retaining wall, and the construction practices used during the construction.
4. Provide the Contractor with a letter after completion, certifying the design meets the requirements of this specification, the design was compatible with the site and the wall was constructed according to design.

1.7 SUBMITTALS

A. The Contractor shall submit the following information for approval thirty (30) days prior to the construction of the segmental retaining wall:

1. Design Submittal – Provide three (3) sets of stamped construction drawings and detailed design calculations, completed and sealed by the Engineer in accordance with the design requirements outlined in Part 3 of this specification. A detailed explanation of the design properties for the geosynthetic reinforcements shall be submitted with the design.
2. Materials Submittal – Manufacturer's certifications, stating that the limestone slabs, the geosynthetic reinforcement, and imported aggregates and soils meet the requirements of this specification and the Engineer's design.
3. Installer Qualifications - The Contractor must be able to demonstrate that their field construction supervisor has the necessary experience for the project by providing documentation showing that they have successfully completed projects of similar scope and size.

1.8 MEASUREMENT FOR PAYMENT

A. Payment for earthworks to prepare the site for the retaining wall construction will be included in the base bid. Additional earthwork as directed and approved in writing by the Owner, or Owner's representative, shall be paid for under a separate pay item.

B. Payment for the retaining wall system will be included in the base bid. The vertical wall face area shall be measured from the top of the base or footing to the top of the coping course multiplied by the length of the wall. The contract unit price shall include the cost of all engineering, labor, materials, and equipment used to install the levelling base or spread footing, wall modules, drainage materials, infill soil, geosynthetic reinforcement, retained soil and site clean up. Additional vertical wall face area as directed and approved in writing by the Owner, or Owner's representative, shall be paid for under a separate pay item.

PART 2 - MATERIALS

2.1 DEFINITIONS

A. All values stated in metric units shall be considered as accurate. Values in parenthesis stated in imperial units are the nominal equivalents.

B. Geogrid reinforcement is a polymer grid structure having tensile strength and durability properties that are suitable for soil reinforcement applications.

C. Infill soil is specified material that is placed directly behind the drainage soil and within the reinforced zone, if applicable.

D. Retained soil is an in-situ soil or a specified soil that is placed behind the wall infill soil.

E. Foundation soil is the in-situ soil beneath the wall structure.

F. Drainage aggregate is a free draining soil encapsulated in a suitable geotextile, and perforated pipe all wrapped in a geotextile, placed directly behind the modular concrete units.

E. Drainage pipe is a perforated polyethylene pipe used to carry water, collected at the base of a soil retaining wall, to outlets in order to prevent pore water pressures from building up behind the wall facing modules.

F. Non-woven geotextiles are permeable synthetic fabrics formed from a random arrangement of fibers in a planar structure. They allow the passage of water from one soil medium to another while preventing the migration of fine particles that might clog a drainage medium.

2.2 PRODUCTS

A. Limestone: Furnish dolomitic limestone slabs with a flat bottom, weathered edges, and top and a clean face. Provide slabs with a minimum height of 8 inches and a depth of 30 inches, lengths shall vary, to ensure stability of the wall.

B. Infill Soil

1. The infill soil shall consist of free draining sands or gravels with less than 5% passing the #200 sieve size or as specified in the Construction Drawings.
2. The Engineer shall review and determine the suitability of the wall infill soil at the time of construction.

C. Retained Soil

1. The retained soil shall be on site soils unless specified otherwise in the Construction Specifications or as directed by the Owner or Owner's Representative. If imported fill is required, it shall be examined and approved by the Engineer.

D. Foundation Soil

1. The foundation soil shall be the native undisturbed onsite soils. The foundation soil shall be examined and approval by the Engineer prior to the placement of the base material.

E. Levelling Base Material

1. The footing material shall be non-frost susceptible, well graded compacted crushed stone (GW-Unified Soil Classification System).

F. Drainage Stone

1. The drainage soil shall be a free draining angular granular material of uniform particle size ¾" separated from the infill soil or retained soil by a geotextile filter. The drainage stonel shall be installed directly behind the slabs to provide adequate drainage capacity.

G. Drainage Pipe

1. The drainage pipe shall be perforated corrugated HDPE or PVC pipe, with a minimum diameter of 150 mm (6 inches), protected by a geotextile filter to prevent the migration of soil particles into the pipe, or as specified on the construction drawings.

H. Geotextile Filter

1. The non-woven geotextile shall be installed as specified on the construction drawings. Although selection of the appropriate geotextile specifications is site soil specific, a commonly used geotextile for filtration will have an Apparent Opening Size ranging between 0.149 and 0.210 mm (U.S. Sieve Sizes 100 to 70) and a minimum unit weight of 170 grams per square meter (5.0 oz /square yard). The coefficient of permeability will typically range between 0.4 and 0.6 cm/second (0.16 to 0.24 in./second).

I. Geogrid Reinforcement

1. The Engineer shall determine the type, strength and placement location of the reinforcing geosynthetic. The design properties of the reinforcement shall be determined according to the procedures outlined in this specification. Detailed test data shall be submitted with the design calculations and shall include tensile strength (ASTM D 4595 or GGI GG-1), creep potential (ASTM D 5262), site damage and durability (GRI GG-4) and pullout resistance (GRI GG-5 or GRI-GT-6) and connection strength (NCMA SRWU-1).

J. Concrete Adhesive

1. The adhesive is used to permanently secure the coping stone to the top course of the wall. The adhesive must provide sufficient strength and remain flexible.

PART 3 - EXECUTION

3.1 DESIGN STANDARD

A. The Engineer is responsible for providing a design that shall consider the external stability, internal stability, and local stability, including global stability, total and differential settlement, of the reinforced slab / soil mass. The design life of the structure shall be 75 years unless otherwise specified in the construction drawings.

3.2 DESIGN GEOMETRY

A. The length, height, and overall elevations of the retaining wall must comply with the requirements of the proposed elevation detail, station information and site grading plan.

B. The structures' design height, H, shall be measured from the top of the levelling pad to the top of the wall where ground surface intercepts the wall facing.

C. Slopes above and below all sections of the segmental retaining wall are detailed in the site grading plan.

D. The minimum wall embedment shall be the greater of the height of a slab or the minimum embedment required because of the slope below the wall.

3.4 STATE OF STRESS

A. The lateral earth pressure to be resisted by the reinforcements at each reinforcement layer shall be calculated using the Coulomb coefficient of earth pressure, Ka, times the vertical stress at each reinforcement layer.

B. The vertical soil stress at each reinforcement layer shall be taken equal to the unit weight of the soil times the depth to the reinforcement layer below the finished grade behind the facing units. A coefficient of active earth pressure, Ka, shall be used from the top to the bottom of the wall. The coefficient of active earth pressure, Ka, shall be assumed independent of all external loads except sloping fills. For sloping fills, the coefficient of active earth pressure, Ka, appropriate for the sloping condition, using Coulomb earth pressure shall be used in the analysis.

3.5 INCLINATION OF FAILURE SURFACE

A. A Coulomb failure surface passing through the base of the wall at the back of the reinforced zone up to the ground surface at or above the top of wall shall be assumed in design of walls.

3.6 GEOSYNTHETIC REINFORCEMENT

A. The allowable reinforcement tension, Ta, shall be determined in accordance with the method outlined in the NCMA Design Manual for Segmental Retaining Walls, Second Edition. This method calculates the Long Term Design Strength (LTDS) of the geosynthetic reinforcement by considering the time-temperature creep characteristics of the reinforcement, environmental degradation, construction-induced damage and an overall factor of safety.

3.7 GEOGRID STRENGTH

A. The minimum soil reinforcement length shall be as required to achieve a minimum width of structure, B, measured from the front face of the wall to the end of the soil reinforcements. B must be greater

than or equal to 60 percent of the total height, H. The length of the reinforcements at the top of the wall may be increased beyond the minimum length required to increase pullout resistance.

3.8 SETTLEMENT CONTROL

A. It is the responsibility of the Engineer to determine if the foundation soils will require special treatment to control total and differential settlement.

3.9 GLOBAL STABILITY

A. It is the responsibility of the Engineer to determine if further design considerations must be implemented to ensure adequate global/overall slope stability.

PART 4 - CONSTRUCTION

4.1 INSPECTION

A. The Engineer is responsible for verifying that the contractor meets all the requirements of the specification. This includes the use of approved materials and their proper installation.

B. The Contractor's field construction supervisor shall have demonstrated experience and be qualified to direct all work related to the retaining wall construction.

4.2 CONSTRUCTION TOLERANCES

A. The following tolerances are the maximum allowable deviation from the planned construction
Vertical Control: +/- 1.25 inches over a 10 ft distance, +/- 3 inches total
Horizontal Control: +/- 1.25 inches over a 10 ft distance, +/- 3 inches total
Rotation: +/- 2 degrees from planned wall batter
Bulging: 1.0 inch over a 10 ft distance

4.3 SITE PREPARATION

A. The foundation soil shall be excavated or filled as required to the grades and dimensions shown on the Construction Drawings or as directed by the Owner or Owner’s Representative.

B. The foundation soil shall be proof rolled and examined by the Engineer to ensure that it meets the minimum strength requirements according to the design assumptions. If unacceptable foundation soil is encountered, the contractor shall excavate the affected areas and replace with suitable quality material under the direction of the Engineer.

C. In cut situations, the native soil shall be excavated to the lines and grades shown on the Construction Drawings and removed from the site or stockpiled for reuse as retained soil.

4.4 INSTALLING DRAINAGE SYSTEM

A. The approved non-woven geotextile shall be set against the back of the first retaining wall unit, over the prepared foundation, and extend towards the back of the excavation, up the excavation face and back over the top of the infill soil to the retaining wall, or as shown in the Construction Drawings.

B. The drainage pipe shall be placed behind the levelling base, or lower course of facing units as shown in the Construction Drawings or as directed by the Engineer. The pipe shall be laid at a minimum gradient of 2% to ensure adequate drainage to free outlets.

C. T - Sections and outlet pipes shall be installed on the drainage pipe at 50 ft. centers or as shown on the Construction Drawings.

D. The remaining length of geotextile shall be pulled taut and pinned over the face of the retained soil. Geotextile overlaps shall be a minimum of 1-ft. and shall be shingled down the face of the excavation in order to prevent the infiltration of retained soil into the wall infill.

4.5 LEVELING BASE OR SPREAD FOOTING PLACEMENT

A. The levelling base material shall be crushed stone compacted to 98% Standard Proctor Density, or vibrated concrete along the grades and dimensions shown on the Construction Drawings or as directed by the Engineer. The minimum thickness of the levelling base shall be 7.25 inches

4.6 INSTALLATION OF LIMESTONE RETAINING WALL SLABS

A. The bottom row of retaining wall modules shall be placed on the prepared levelling base as shown on the Construction Drawings. Care shall be taken to ensure that the wall modules are aligned properly, levelled from side to side and front to back and are in complete contact with the base material.

B. Place limestone slabs. Ensure adjacent slabs are in full contact without gaps.

C. Stagger vertical joints so no joint is located closer than 2 feet to a joint in the course below it

C. The slabs shall be swept clean before placing additional levels to ensure that no dirt, concrete or other foreign materials become lodged between successive lifts of the wall modules.

D. After each course is laid, place backfill material behind the wall and compact with hand tools to a density equal to or greater than the existing soil behind the wall.

E. The contractor shall check the level of slabs with each lift to ensure that no gaps are formed between successive lifts that may affect the pullout resistance of geogrid reinforcement, if applicable.

F. Care shall be taken to ensure that the wall modules and geosynthetic reinforcement are not broken or damaged during handling and placement.

4.7 DRAINAGE STONE

A. The drainage soil will be placed behind the retaining wall slabs with a minimum width of 1 ft. and separated from other soils using the approved non-woven geotextile.

B. Drainage soil shall be placed behind the wall facing in maximum lifts of 6 inches and compacted to a minimum density of 95% Standard Proctor

C. No heavy compaction equipment shall be allowed within 3 ft. of the back of the wall fascia.

4.8 INFILL SOIL

A. Wall infill soil shall be placed behind the first course of the wall facing units in maximum lifts of 6 inches and compacted to a minimum density of 95% Standard Proctor. At the specified elevations, geogrid reinforcement shall be placed, as described herein. The fill shall be placed and compacted level with the top of the wall modules at the specified geogrid elevations prior to placing the geogrid reinforcement.

B. Wall infill soil shall be placed on top of the geogrid reinforcement layers in maximum lifts of 6 inches and compacted to a minimum of 95% Standard Proctor Density. Care shall be taken to ensure that

the geogrid lays flat and taut during placement of the infill soil. This is best achieved by placing fill on top of the geogrid near the wall facia and spreading toward the back of the infill soil zone.

C. No tracked construction equipment shall be allowed to operate directly on top of the geogrid until a minimum thickness of 6 inches of fill has been placed. Rubber tired equipment may drive on top of the geogrid at slow speeds but should exercise care not to stop suddenly or make sharp turns. No heavy equipment shall be allowed within 1 meter (3 ft.) of the back of the wall.

4.9 GEOGRID SOIL REINFORCEMENT

A. Pre-cut sections of geogrid reinforcement shall be placed horizontally at the specified elevations and with longitudinal axis perpendicular to the wall face (i.e. machine direction), at the elevations shown on the Construction Drawings, or as directed by the Engineer.

B. The geogrid shall be placed over the compacted infill soil and the wall facing units with the outside edge extending over the tongue of the bottom unit and to within 1 in. of the front facing unit. Care shall be taken to ensure that the wall modules are swept clean and that the geogrid is in complete contact with the top and bottom faces of the adjacent wall modules. The next course of wall modules shall be carefully placed on top of the lower modules to ensure that no pieces of concrete are chipped off and become lodged between unit layers.

C. The geogrid shall be pulled taut away from the back the wall modules during placement of infill soil. Alternatively, suitable anchoring pins or staples can be used to ensure that there are no wrinkles or slackness prior to placement of the infill soil. The geogrid shall lay perfectly flat when pulled back perpendicular to the back of the wall facia.

4.10 RETAINED SOIL

A. Retained soils shall be placed and compacted behind the infill soil or drainage soil if applicable, in maximum lift thickness of 150 mm (6 inches). The retained soils shall be undisturbed native material or engineered fill compacted to a minimum density of 95% Standard Proctor.

B. No heavy compaction equipment shall be allowed within 3 ft. of the back of the wall modules.

4.11 FINISHING WALL

A. Items shall be repeated until the grades indicated on the Construction Drawings are achieved.

B. Coping units shall be secured to the top of the wall with two 3/8 inch beads of the approved flexible concrete adhesive positioned 2 inches in front and behind the tongue of the last course of retaining wall units.

C. Finish grading above the wall to direct surface run off water away from the segmental retaining wall. Use a soil with a low permeability to restrict the rate of water infiltration into the retaining wall structure.

END OF SECTION

EXTERIOR PLANTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

B. Related Sections:

1. Section 32 9119 Topsoil

1.2 SCOPE

A. This work under this section specifications shall consist of the following:

1. Preparation of subsoil and topsoil
2. Topsoil bedding
3. Trees
4. Mulch
5. Fertilizer
6. Pruning
7. Maintenance

1.3 DEFINITIONS

A. Balled and Burlapped Stock: Exterior plants dug with firm, natural balls of earth in which they are grown, with ball size not less than sizes indicated; wrapped, tied, rigidly supported, and drum-laced as recommended by ANSI Z60.1.

B. Balled and Potted Stock: Exterior plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than sizes indicated.

C. Bare-Root Stock: Exterior plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than minimum root spread according to ANSI Z60.1 for kind and size of exterior plant required.

D. Container-Grown Stock; healthy, ‘vigorous, well-rooted exterior plants grown in a container with well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for kind, type, and size of exterior plant required.

E. Fabric Bag-Grown Stock Healthy, vigorous, well-rooted exterior plants established and grown in-ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60. 1 for type and size of exterior plant.

F. Finish Grade: Elevation of finished surface of planting soil.

G. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

H. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

I. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

1.4 SUBMITTALS

A. Nursery Source: For all nursery stock indicated on Plans.

1. Submit list of growers for each plant species to be installed within 30 days following award of contract. Include substitution requests based on plant unavailability at that time. Substitution requests after this period will not be accepted.

B. Submit material samples to Landscape Architect: peat moss, shredded hardwood bark mulch, planting accessories, pre-emergent herbicides, and plant fertilizers.

C. Submit materials certification to Landscape Architect: Topsoil source and pH value, peat moss and plant fertilizer.

D. Material Test Reports: For existing native surface topsoil and imported topsoil. Contractor shall be responsible to provide and pay for material testing. Testing agency shall be acceptable to the Landscape Architect.

E. Planting Schedule: Indicating anticipated planting dates for exterior plants.

F. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before start of required maintenance periods.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of exterior plants.

1. The Contractor, and its Subcontractors, shall provide a staff adequate to coordinate and expedite the work properly and shall maintain competent supervision of its own work to insure compliance with contract requirements.
2. Installer Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when exterior planting is in progress.

B. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of topsoil.

1. Report suitability of topsoil for plant growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.

D. Comply with sizing and grading standards of the latest edition of 'American Standard for Nursery Stock". A plant shall be dimensioned as it stands in its natural position. Stock furnished shall be at least the minimum size indicated. Larger size is acceptable, at no additional charge. Larger plants shall not be cut back to size indicated.

E. Before proceeding with work, check and verify quantities and dimensions. Report variations between Drawings and the site to the Landscape Architect before proceeding with work of this section. Plant totals are for convenience only and are not guaranteed. All plantings indicated on Drawings are required unless indicated otherwise.

F. Evaluation: Landscape Architect may evaluate trees and shrubs either at place of growth or at site before planting for compliance with requirements for genus, species, variety, size, and quality. Landscape Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify Landscape Architect of sources of planting materials seven days in advance of delivery to site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver exterior plants freshly dug.

1. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.

B. Do not prune trees and shrubs before delivery, except as approved by Landscape Architect. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery.

C. Take all precautions customary in good trade practice in preparing plants for moving. Workmanship that fails to meet the highest standards will be rejected. Plants transported on open vehicles shall be covered to prevent wind burn.

D. Inspection certificates required by law shall accompany each shipment invoice or order to stock on arrival. The certificate shall be filed with the General Contractor's representative.

E. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants trees in shade, protect from weather and mechanical damage, and keep roots moist.

1. Heel-in bare-root stock. Soak roots in water for two hours if dried out.
2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.
4. Water root systems of exterior plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

1.7 COORDINATION

A. Planting Restrictions: Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Evergreen Material: Plant Evergreen materials between September 1 and October 15 or in Spring before new growth begins. If project requirements require planting at other times, plants shall be sprayed with anti-disiccant prior to planting operations.

2. Deciduous material: Plant deciduous materials in a dormant condition. If deciduous trees are planted in leaf, they shall be sprayed with anti-desiccant prior to planting operation.

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

C. Coordination with Lawns & Irrigation: Plant trees and shrubs after finish grades are established and irrigation has been installed, and before planting lawns.

1. When planting trees and shrubs after lawns, protect lawn areas and promptly repair damage caused by planting operations.

1.8 WARRANTY

A. Special Warranty: Warrant the following exterior plants, for the warranty period indicated, against defects including death and unsatisfactory growth, except for defects resulting from lack of: adequate maintenance, neglect, or abuse by Owner, or incidents that are beyond the Contractor's control.

1. Warranty Period: One year from date of Substantial Completion.
2. Remove dead exterior plants immediately. Replace immediately unless required to plant in the succeeding planting season.
3. Replace exterior plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
4. A limit of one replacement of each exterior plant will be required, except for losses or replacements due to failure to comply with requirements.

1.9 MAINTENANCE

A. Trees and Shrubs: Maintain for the following maintenance period by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, tightening and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray as required to keep trees and shrubs free of insects and disease. Restore or replace damaged tree wrappings.

1. Maintenance Period: Six (6) months from date of Substantial Completion.

B. Ground Cover and Plants: Maintain for the following maintenance period by watering, weeding, fertilizing, and other operations as required to establish healthy, viable plantings:

1. Maintenance Period: Three (3) months from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 TREE AND SHRUB MATERIAL

A. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

B. Grade: Provide trees and shrubs of sizes and grades complying with ANSI Z60.1 for type of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to Landscape Architect, with a proportionate increase in size of roots or balls.

C. Label each tree and shrub with securely attached, waterproof tag bearing legible designation of botanical and common name.

D. Label at least one tree and one shrub of each variety and caliper with a securely attached, waterproof tag bearing legible designation of botanical and common name.

E. If formal arrangements or consecutive order of trees or shrubs is shown, select stock for uniform height and spread, and number label to assure symmetry in planting.

2.2 SHADE AND FLOWERING TREES

A. Shade Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, complying with ANSI Z60.1 for type of trees required.

1. Provide balled and burlapped trees.
2. Branching Height: One-third to one-half of tree height.

B. Small Upright or Spreading Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60 1; stem form as follows:

1. Stem Form: Single stem.
2. Provide balled and burlapped trees.

C. Multistem Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1; stem form as follows:

1. Stem Form: Clump.
2. Provide balled and burlapped trees.

2.3 DECIDUOUS SHRUBS

A. Form and Size; Deciduous shrubs with not less than the minimum number of canes required by and measured according to ANSI Z60.1 for type, shape, and height of shrub.

1. Provide balled and potted and container-grown trees.

2.4 CONIFEROUS EVERGREENS

A. Form and Size: Normal-quality, well-balanced, coniferous evergreens, of type, height, spread, and shape required, complying with ANSI Z60.1.

B. Form and Size: Specimen-quality, exceptionally heavy, tightly knit, symmetrically shaped coniferous evergreens and the following grade:

1. Provide balled and potted and container-grown trees.

2.5 BROADLEAF EVERGREENS

A. Form and Size: Normal-quality, well-balanced, broadleaf evergreens, of type, height, spread, and shape required, complying with ANSI Z60. 1.

1. Provide balled and burlapped trees or container-grown shrubs.

2.6 PLANTS

A. Annuals: Provide healthy, disease-free plants of species and variety shown or listed. Provide only plants that are acclimated to outdoor conditions before delivery and that are in bud but not yet in bloom.

B. Perennials: Provide healthy, field-grown plants from a commercial nursery, of species and variety shown or listed

C. Fast-Growing Vines: Provide vines of species indicated complying with requirements in ANSI Z60. 1 as follows:

1. Two-year plants with heavy, well-branched tops, with not less than 3 runners 18 inches or more ,in length, and with a vigorous well-developed root system.
2. Provide field-grown vines. Vines grown in pots or other containers of adequate size and acclimated to outside conditions will also be acceptable.

D. Groundcover Plants: Provide ground cover of species indicated, established and well rooted in pots or similar containers, and complying with ANSI Z60.1.

1. Groundcover shall be grown in its container for one year prior to installation.

2.7 TOPSOIL

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 6 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.

1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

a. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep. Do not obtain from agricultural land, bogs or marshes.

b. Amend topsoil as necessary.

2.8 INORGANIC SOIL AMENDMENTS

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

1. Class: Class T, with a minimum 99 percent passing through No. 8 sieve and a minimum 75 percent passing through No. 60 sieve.
2. Provide lime in form of ground dolomitic limestone. Use to adjust soil pH only, under discretion of Landscape Architect.

B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum 99 percent passing through No. 6 sieve and a maximum 10 percent passing through No. 40 sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Aluminum Sulfate: Commercial grade, unadulterated.

E. Perlite: Horticultural perlite, soil amendment grade.

F. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.

G. Sand: Clean, washed, natural or manufactured, free of toxic materials.

2.9 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1/2-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.

B. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water absorbing capacity of 1100 to 2000 percent.

C. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.10 FERTILIZER

A. Bonemeal: Commercial raw or steamed, finely ground; a minimum of 1 percent nitrogen and 10 percent phosphoric acid.

B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
2. Composition Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.11 MULCH

A. Shredded bark mulch shall be double-processed, dark shredded hardwood bark mulch that is clean and free of debris and sticks. Materials shall be uniform in size, shape, and texture. Submit samples to Landscape Architect for approval prior to installation. Install mulch to finish grade, level smooth, without ridges, humps or depressions.

B. Install to depth shown on plans.

2.12 WEED CONTROL BARRIERS

A. Nonwoven Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. minimum.

B. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz./sq. yd.

2.13 STAKES AND GUYS

A. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, redwood, or pressure preservative-treated softwood, free of knots, holes, cross grain, and other defects, 2 by 2 inches by length indicated, pointed at one end.

B. Guy and Tie Wire: ASTM A 641/A 641M, Class 1, galvanized-steel wire, 2-strand, twisted, 0.106 inch in diameter.

C. Guy Cable: 5-strand, 3/16-inch- diameter, galvanized-steel cable, with zinc-coated turnbuckles, a minimum of 3 inches long, with two 3/8-inch galvanized eyebolts.

D. Hose Chafing Guard; Reinforced rubber or plastic hose at least 1/2 inch in diameter, black, cut to lengths required to protect tree trunks from damage.

E. Flags: Standard surveyor’s plastic flagging tape, white, 6 inches long.

2.15 MISCELLANEOUS PRODUCTS

A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

B. Trunk-Wrap Tape: Two layers of crinkled paper cemented together with bituminous material, 4-inch- wide minimum, with stretch factor of 33 percent.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive exterior plants for compliance with requirements and conditions affecting installation and performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, end other facilities, and la' and existing exterior plants from damage caused by planting operations.

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple exterior plantings. Stake locations, outline areas, adjust locations when requested, and obtain Landscape Architect's acceptance of layout before planting. Make minor adjustments as required.

D. Lay out exterior plants at locations directed by Landscape Architect Stake locations of individual trees and shrubs and outline areas for multiple plantings.

E. Apply antidesiccant to tees and shrubs using power spray to provide an adequate film over trunks, branches, stems, twigs, and foliage to protect during digging, handling, and transportation.

1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

3.3 TREE AND SHRUB EXCAVATION

A. Pits and Trenches: Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root bail and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.

1. Excavate approximately three times as wide as ball diameter for balled and burlapped, balled and potted, container grown, or fabric bag-grown stock.
2. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
3. If drain tile is required under planted areas, excavate to top of porous backfill over tile.

B. Subsoil removed from excavations may not be used as backfill.

C. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

1. Hardpan Layer: Drill 6-inch- diameter holes into free-drawing strata or to a depth of 10 feet, whichever is less and backfill with free-draining material.

D. Drainage: Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.

E. Fill excavations with water and allow to percolate away before positioning trees and shrubs

3.5 TREE AND SHRUB PLANTING

A. Set balled and burlapped stock plumb and in center of pit or trench with top of root ball 1 inch above adjacent finish grades.

1. Place stock on setting layer of compacted planting soil.
2. Remove burlap and wire baskets from tops of root balls and partially from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.

B. Set container grown stock plumb and in center of pit or trench with top of root ball 1 inch above adjacent finish grades.

1. Carefully remove root ball from container without damaging root ball or plant.
2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.
3. Organic Mulching: Apply 3-inch average thickness of organic mulch extending 12 inches beyond edge of planting pit or trench. Do not place mulch within 3 inches of trunks or stems.
4. Wrap trees of 2-inch caliper and larger with trunk-wrap tape. Start at base of trunk and spiral cover trunk to height of first branches. Overlap wrap, exposing half the width, and securely attach without causing girdling. Inspect tree trunks for injury, improper pruning, and insect infestation; take corrective measures required before wrapping.

C. Set fabric bag-grown stock plumb and in center of pit or trench with top of root ball 1 inch above adjacent finish grades.

1. Carefully remove root ball from fabric bag without damaging root ball or plant. Do not use planting stock if root ball is cracked or broken before or during planting operation.
2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.

D. Set and support bare-root stock in center of pit or trench with root collar or trunk flare 1 inch below adjacent finish grade. Spread roots without tangling or turning toward surface, and carefully work backfill around roots by hand. Puddle with water until backfill layers are completely saturated. Plumb before backfilling, and maintain plumb while working backfill around roots and placing layers above roots. Tamp final layer of backfill. Remove injured roots by cutting cleanly; do not break.

1. Organic Mulching: Apply 3-inch average thickness of organic mulch extending 12 inches beyond edge of planting pit or trench. Do not place mulch within 3 inches of trunks or stems.
2. Wrap trees of 2-inch caliper and larger with trunk-wrap tape. Start at base of trunk and spiral cover trunk to height of first branches. Overlap wrap, exposing half the width, and securely attach without causing girdling. Inspect tree trunks for injury, improper pruning, and insect infestation; take corrective measures required before wrapping.
3. Organic Mulching: Apply 3-inch average thickness of organic mulch extending 12 inches beyond edge of planting pit or trench. Do not place mulch within 3 inches of trunks or stems.
4. Wrap trees of 2-inch caliper and larger with trunk-wrap tape. Start at base of trunk and spiral cover trunk to height of first branches. Overlap wrap, exposing half the width, and securely attach without causing girdling. Inspect tree trunks for injury, improper pruning, and insect infestation; take corrective measures required before wrapping.

3.6 TREE AND SHRUB PRUNING

A. Prune, thin, and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise indicated by Landscape Architect, do not cut tree leaders; remove only injured or dead branches from flowering frees. Prune shrubs to retain natural character. Shrub sizes indicated are sizes after pruning.

3.7 GUYING AND STAKING

A. Upright Staking and Tying: Stake trees of 2- through 5-inch caliper. Stake trees of less than 2-inch caliper only as required to prevent wind tip-out. Use a minimum of 2 stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend at least 72 inches above grade. Set vertical stakes and space to avoid penetrating root balls or root masses. Support trees with two strands of tie wire encased in hose sections at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree. Use the number of stakes as follows:

1. Use 2 stakes for trees up to 12 feet high and 2-1/2 inches or less in caliper; 3 stakes for trees less than 14 feet high and up to 4 inches in caliper. Space stakes equally around trees.

B. Guying and Staking: Guy and stake trees exceeding 14 feet in height and more than 3 inches in caliper, unless otherwise indicated. Securely attach no fewer than 3 guys to stakes 30 inches long, driven to grade.

1. For trees more than 6 inches in caliper, anchor guys to pressure-preservative-treated deadmen 8 inches in diameter and 48 inches long buried at least 36 inches below grade. Provide turnbuckles for each guy wire and tighten securely.
2. Attach flags to each guy with, 30 inches above finish grade.
3. Paint turnbuckles with luminescent white paint.

3.8 PLANTERS

A. Planters: Place a layer of gravel at least 4 inches thick in bottom of planters, cover with nonwoven fabric, and fill with planter soil mix. Place soil in lightly compacted layers to an elevation of I-1/2 inches below top of planter, allowing natural settlement.

1. Planter Soil Mix: One part topsoil, one part coarse sand, one part peat, and 3 lb of dolomitic limestone per cubic yard of mix.

3.9 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants as indicated on plans.

B. Dig holes large enough to allow spreading of roots, and backfill with planting soil.

C. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

1. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

D. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.10 PLANTING BED MULCHING

A. Install weed-control barriers before mulching according to manufacturer's written instructions. Completely cover area to be mulched, overlapping edges a minimum of 6 inches.

B. Mulch backfilled surfaces of planting beds and other areas indicated.

1. Organic Mulch: Apply 3 inch average thickness of organic mulch, and finish level with adjacent finish grades. Do not place mulch against plant stems.

3.11 EDGING INSTALLATION

A. Aluminum Edging: Install aluminum edging where indicated according to manufacturer's written instructions. Anchor with aluminum stakes spaced approximately 48 inches apart; driven below top elevation of edging.

3.13 CLEANUP AND PROTECTION

A. During exterior planting, keep. adjacent paving's and construction clean and work area in an orderly condition.
B. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged exterior planting.

3.14 DISPOSAL
A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property

END OF SECTION

ENGINEERED WOOD FIBER

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

B. All products supplied shall submit certification that material meets the current Consumer Product Safety Commission and ADA requirements.

1.2 SCOPE

A. The work under this section shall consist of furnishing all labor, materials and equipment to for the installation of an engineered wood fiber bark mulch in accordance to the drawings and specifications.

1.3 QUALITY ASSURANCE

A. Reference Standards:

1. American Society for Testing and Materials (ASTM):

    a. ASTM F1951 – Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
    b. ASTM F1292 – Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment
    c. ASTM F1487 - Standard Consumer Safety Performance Specification for Playground Equipment for Public Use
    d. ASTM F2075 – Standard Specification for Engineered Wood Fiber for use as a Playground Safety Surface Under or Around Playground Equipment.

1.4 SUBMITTALS

A. Manufacturer’s Literature: Furnish to Architect, when required and copies of manufacturer’s specifications. Include photographs, catalogue cuts, samples as may be required to show compliance with these specifications.

B. Testing Data Relating to the Following:

1. Critical height based on ASTM F1292 impact attenuation testing
2. Minimum fill-depth data
3. Toxicity
4. ADA/ABA accessibility guidelines for firmness and stability based on ASTM F1951.

PART 2 - PRODUCT

2.1 ACCEPTABLE MANUFACTURERS:

A.	Sof Fall	Manufactured by:	Sof Fall Ashton, Idaho 800-523-8690 (Elouise)
B.	CushionWood	Manufactured by:	Kamps Wood Resources Grand Rapids MI 49504 616 453-1986
C.	Safe Site System	Manufactured by:	Safe Site Systems Cincinnati, OH 45248
D.	WoodCarpet	Manufactured by:	Zeager Bros. Inc. Middletown, PA 17057-9954 800-346-8524
E.	Fibar Systems	Manufactured by:	Fibar Group Mamaroneck N.Y 800-342-2721

PART 3 - EXECUTION

3.1 INSTALLATION

A. The bark mulch shall be furnished and installed as per the details and manufacturers recommendations.

END OF SECTION

MANHOLES, CATCH BASINS AND SIMILAR STRUCTURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

B. Related Sections:

1. Section 03 3010 Portland Cement Concrete
2. Section 31 2000 Earthwork
3. Section 33 4100 Storm Sewer System
4. Section 33 4600 Subdrainage System

1.2 SCOPE

A. The work under this section of the specifications shall consist of furnishing all labor, materials and equipment necessary to furnish and install manholes and catch basins as indicated on Contract Documents and specified herein.

1.3 QUALITY ASSURANCE

A. Reference Standards:

1. American Society for Testing and Materials (ASTM):
   a. ASTM A48 – Standard Specification for Gray Iron Castings
   b. ASTM C139 – Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes
   c. ASTM C144 – Standard Specification for Aggregate for Masonry Mortar
   d. ASTM C478 – Standard Specification for Precast Reinforced Concrete Manhole Sections
2. Michigan Department of Transportation (MDOT)

1.4 SUBMITTALS

A. Manufacturer’s Literature: Furnish to Landscape Architect copies of manufacturer’s specifications, maintenance and installation instructions for each of the items specified herein. Include photographs, catalogue cuts, and other data as may be required to show compliance with these specifications.

PART 2 – PRODUCTS

2.1 GENERAL

A. Concrete to be 3500 psi at 28 days.

B. Masonry sand for mortar shall conform to ASTM C144.

C. Steel reinforcement to be as per manufacturer’s recommendations.

2.2 CASTINGS

A. All castings shall be of cast iron, conforming to ASTM A48 unless indicated otherwise. Conform to details and notes indicated on plans.

B. Manhole frames and covers: Material shall be MDOT Type A with perforated covers.

C. Catch basins and inlet castings: Catch basin and inlet castings shall be MDOT Type K when located in curbs and gutter, MDOT Type E in non-paved locations, and MDOT Type A when located in paved areas.

2.3 MANHOLE SECTIONS

A. Manhole Walls

1. Standard manhole walls shall be precast concrete units conforming to ASTM C478, or be concrete block masonry.

B. Manhole Bases: Manhole bases shall be precast concrete units of the dimensions indicated on drawings.

2.4 MANHOLE STEPS

A. Manhole steps shall be of cast iron conforming to ASTM A48 or equal, and shall meet pertinent safety rules and regulations.

2.5 CATCH BASINS AND INLETS

A. Construct catch basins and inlets of brick, block, masonry, or precast units. Precast concrete catch basin units, if used, shall have reinforcing steel conforming to ASTM C799 II, Wall B.

2.6 MORTAR

A. Mortar for brick masonry or plastering manholes shall be made of one part Portland cement to two parts sand. Mortar shall conform to Specification Section 04 0513.

2.7 BRICK

A. Brick work shall meet the requirements of Medium Brick, ASTM C13

2.8 CONCRETE BLOCK MASONRY

A. Concrete block masonry shall meet the requirements of ASTM C139.

PART 3 - EXECUTION

3.1 EXCAVATION

A. Excavation shall be of sufficient dimensions to provide ample space for sheathing and bracing is required and ample space for the workmen to perform their work in a satisfactory manner.

B. Refer to requirements of Section 31 2000 Earthwork.

C. All structure shall be backfilled and tamped in lifts not greater than 8”. Contractor shall have on site al necessary power equipment to achieve 95% compaction.

3.2 BRICK AND BLOCK CONSTRUCTION

A. Laying of brick or block units shall be performed in such a manner that the courses will be true to line and the joints fully bonded.

1. In a structure of cylindrical design, the bricks shall be laid with the long dimension radially in the structure.
2. In a structure of rectangular design, the bricks shall be laid in alternate courses of headers and stretchers.
3. Structures

    a. Manholes shall be constructed of brick, concrete masonry units, precast reinforced concrete pipe, or monolithic concrete or as detailed.
    b. All manholes shall be constructed to conform to the details shown on drawings.

        i. Openings shall be provided in the manholes for future connections as shown on the plans or as ordered by the Engineer, of such size and at such elevation as directed and shall be considered incidental to the construction of the manhole.
        ii. All such openings shall be closed with concrete or vitrified clay stoppers or brick bulkheads, to prevent infiltration or leakage.

    c. The outside surface of all brick or masonry manholes on sanitary sewers shall be plastered one-half inch with mortar.
    d. Cast iron manhole steps shall be set in a full mortar bed in the masonry.
    e. Tops shall be tapered to receive the casting.
    f. The manhole castings shall be set in a full mortar bed with the top at the required elevation and treated directly in line with the steps.
    g. Manholes shall have flow lines shaped with concrete up to the spring line of the lines passing through.

4. Catch basins shall be constructed of brick, concrete masonry units, precast reinforced concrete pipe, or monolithic concrete, and shall conform to details shown on drawings.

    a. The inside surface of all brick or block catch basins shall be plastered one-half inch thick from the bottom to the corbel. The joints between the sections of precast pipe catch basins shall be plastered one-half inch thick and six inches wide, and no other plastering is required on such catch basins.
    b. Catch basins which have lines of 30" diameter or larger entering, or four (4) or more lines entering, shall have an inside diameter of five feet.
    c. Catch basins shall have a two (2) foot deep sump.
    d. Tops shall be tapered to receive the casting.
    e. Catch basins castings shall be set in a full mortar bed on top of the masonry. The castings shall be set with the top at the required elevation.

3.3 ADJUSTING EXISTING STRUCTURES

A. Whenever existing manholes, catch basins, valve chambers, or similar structures occur, the tops of such structures shall be adjusted or rebuilt so that the top of the casting will fit the crown and/or grade of the finished surface.

B. Raising castings shall be accomplished by use of precast adjusting rings and/or brick set in a full mortar bed with the casting re-set in accordance with preceding requirements for new construction.

C. Lowering castings shall be accomplished by removing a sufficient amount of the existing structure to allow for reconstruction of the taper section and re-setting the casting in accordance with the preceding requirements for new construction.

END OF SECTION

SUBDRAINAGE SYSTEMS – FLAT DRAINTILE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

B. Related Sections

1. Section 31 2000 Earthwork
2. Section 31 3219 Geotextile Fabric

1.2 SCOPE

A. The work under this section consists of furnishing all labor, materials and equipment to install the drainage system, couplings and accessories for the artificial turf subdrainage system.

1.3 QUALITY ASSURANCE

A. Reference Standards:

1. American Society for Testing and Materials (ASTM):

a. ASTM D2729 – Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
b. ASTM D3350 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

2. American Association of State Highway and Transportation Officials (AASHTO):

a. AASHTO M294 – Standard Specification for Corrugated Polyethylene Pipe

1.4 SUBMITTALS

A. Manufacturer's Literature: Furnish to Landscape Architect, copies of manufacturer's specifications, maintenance, and installation instructions for each item specified herein. Include photographs, catalogue cuts, and other data as may be required to show compliance with these specifications.

PART 2 - PRODUCTS

2.1 DRAINTILE - GENERAL

A. High Density corrugated polyethylene (HDPE), tubular-style perforated type, pipe and fittings.

B. Hancor "HI-Q", ADS N-12, or approved equal.

C. Diameter of systems lateral and collector lines as shown on plans.

2.2 DRAINTILE - FLAT DRAIN

A. AdvanEDGE pipe with geotextile sock manufactured by Advanced Drainage Systems, Inc. (800) 733-9554. Size as indicated on Drawings.

B. Multi-Flow manufactured by Varicore Technologies, Inc., (800) 978-8007. Size as indicated on Drawings.

2.3 TRENCH MATERIAL

A. Filter Aggregate: Evenly graded mixture of ¾" diameter clean crushed stone.

PART 3 - EXECUTION

3.1 INSTALLATION FOR CORRUGATED POLYETHYLENE TUBING

A. Hand trim excavating to required elevations. Do not over excavate. Remove large stones or other hard matter which could damage drain tile.

B. Place a two inch (2") thick bed of filter aggregate.

C. Install the drainage tile on the filter aggregate bed.

D. Ensure complete connection to storm sewer using perforated pipe.

E. Cover the pipe with filter aggregate to top of trench and compact to 90% Modified Proctor.

3.2 INSTALLATION FOR “FLAT DRAIN” PIPE

A. Install flat drain pipe horizontally, being sure to allow for a minimum of 8” of stone below turf material.

B. Joints shall be made using manufacturers couplers prior to placing flat drain on subgrade. Use 2 coupling pins for each coupler. Couplers shall be placed under the fabric at the joint to prevent backfill infiltration. To accomplish this, split the fabric seam and lay back the fabric approximately 8”. Install the coupler with 2 pins. Replace fabric over the coupler and secure the fabric with suitable tape.

C. End caps shall be used at all termination points to prevent soil infiltration into system.

D. Compact stone to appropriate modified proctor density value.

END OF SECTION

SUBDRAINAGE SYSTEMS - PEASTONE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

B. Related Sections

1. Section 31 2000 Earthwork

1.2 SCOPE

A. The work under this section consists of furnishing all labor, materials and equipment to install the drainage system, couplings and accessories for an operating sub-drainage system.

1.3 QUALITY ASSURANCE

A. Reference Standards:

1. American Society for Testing and Materials (ASTM):

a. ASTM D1785 – Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe
b. ASTM D3350 – Standard Specification for Polyethylene Plastics Pipe and Fitting Materials
c. ASTM F405 – Standard Specification for Corrugated Polyethylene Pipe and Fittings

2. American Association of State Highway and Transportation Officials (AASHTO):

a. AASHTO M294 – Standard Specification for Corrugated Polyethylene Pipe

1.4 SUBMITTALS

A. Manufacturer’s Literature: Furnish to Landscape Architect, copies of manufacturer’s specifications, maintenance, and installation instructions for each item specified herein. Include photographs, catalogue cuts, and other data as may be required to show compliance with these specifications.

PART 2 - PRODUCTS

2.1 DRAINAGE TILE

A. Perforated corrugated polyethylene tubing (with filter wrap) complete with required couplings and fittings.

2.2 PEASTONE

A. 3/8” minus peastone to be used as backfill material.

PART 3 - EXECUTION

3.1 EXECUTION FOR CORRUGATED POLYETHYLENE TUBING

A. Hand trim excavating to required elevations. Do not over excavate. Remove large stones or other hard matter which could damage drain tile.

B. Place a two inch (2") thick bed of filter aggregate.

C. Install the drainage tile on the filter aggregate bed.

D. Ensure complete connection to storm sewer using perforated pipe.

E. Cover the pipe with filter aggregate to top of trench and compact to 90% Modified Proctor.

END OF SECTION

180281: Troy ECC_ Playground & Signage_BP4

Prepared by Barton Malow Company - 1274 Library St, Detroit, MI 48226, USA

Project Lead: Stephanie Buhagiar (stephanie.buhagiar@bartonmalow.com)

Project Location: Troy, MI, US

Proposal Summary	Awarded / Apparent Low	2nd Apparent Low	3rd Apparent Low
Generated December 18th 2018	Awarded bids are highlighted		
Submitted Total	**$30,827.94**		
BID PACKAGES	Company — Total Cost	Company — Total Cost	Company — Total Cost
Playground & Sitework (NOT OPENED)			
Signage (Interior & Exterior)	ASI Signage Innovations — **$30,828**	JL Geisler Corporation — **$33,973**	Visual Entities — **$44,770**
Subtotal	**$30,827.94**		