

Bid, Contract, and Technical Specifications

Tallgrass Trail
Maintenance/Storage Facility

Marion, Ohio

October 2026

BURGESS & NIPLE

**BID, CONTRACT, AND TECHNICAL SPECIFICATIONS
FOR**

MARION COUNTY PARK DISTRICT

**TALLGRASS TRAIL MAINTENANCE/STORAGE FACILITY
MARION, OHIO**

PREPARED FOR

**MARION COUNTY PARK DISTRICT
222 WEST CENTER STREET
MARION, OHIO 43302**

OCTOBER 2026

**BURGESS & NIPLE, INC.
ENGINEERS • ENVIRONMENTAL SCIENTISTS • GEOLOGISTS
330 RUSH ALLEY, SUITE 700
COLUMBUS, OHIO 43215**

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**Marion County Park District
Tallgrass Trail Maintenance/Storage Facility
Marion County, Ohio**

Bids Due: 4:00 p.m., Thursday, November 5, 2026 by email to: Marioncountyparkdistrict@gmail.com and Megan.Bowman@burgessniple.com

<u>Contract</u>	<u>Estimated Cost</u>
General (Base Bid)	\$102,000.00
Alternate #1	\$1,500.00

Bid Documents: Register to receive them electronically by email to: Megan.Bowman@burgessniple.com
More Info: Brian Tornes, PE, Burgess & Niple, Inc., (614) 459-2050, Brian.Tornes@burgessniple.com

----- end of advertisement—do not publish this line -----

APPROVED FOR PUBLICATION

In: Marion Star
On: 10/14/2026
10/21/2026
10/28/2026

ADVERTISEMENT FOR BIDS

Marion County Park District
222 W. Center St, Marion, OH 43302

Electronically submitted Bids for the construction of Tallgrass Trail Maintenance/ Storage Facility will be received by Marion County Park District by Mr. Dan Sheridan, Director, at marioncountyparkdistrict@gmail.com until 4:00 p.m. (EST), November 5, 2026, and then at said office opened.

The work covered by the Contract Documents includes the development of a new 1,200 square foot maintenance/ storage building complete with gravel walks, building and electrical together with the necessary appertaining work.

The project is to be complete and ready for occupancy within 160 days of issuance of a notice to proceed.

Copies of the Bidding Documents can be obtained by registering with Burgess & Niple, Inc. as a plan holder by contacting Ms. Megan Bowman at (614) 459-2050 or by email at megan.bowman@burgessniple.com.

Prospective BIDDERS may address written inquiries to Mr. Brian Tornes of Burgess & Niple, Inc. at brian.tornes@burgessniple.com.

Attention to the BIDDERS is called to the Instructions to Bidders, which are included in the proposed Contract Documents.

The Marion County Park District reserves the right to reject any and all Bids or to increase or decrease or omit any item or items and/or award to the lowest responsive and responsible BIDDER. Each proposal must contain the full name of every person or company interested in the same. The Marion County Park District reserves the right to waive any informalities or irregularities in the Bidding.

By order of the Marion County Park District Board.

INSTRUCTIONS TO BIDDERS

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INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS

Terms used in Instructions to BIDDERS are defined in the General Provisions included within these bid and contract documents.

Certain additional terms used in these Instructions to BIDDERS have the meanings indicated below which are applicable to both the singular and plural thereof.

- 1.1. **Issuing Office** - the office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.

2. COPIES OF BIDDING DOCUMENTS

- 2.1. Complete sets of the Bidding Documents shall be obtained electronically as noted in the Advertisement for Bids by contacting Megan Bowman at megan.bowman@burgessniple.com and registering for the documents. If paper copies are required, they may also be obtained by payment of a fee of \$50.
- 2.2. All Bidders must be registered as a plan holder at the time of bid. Registration as a plan holder is free of charge and can be completed by contacting Megan Bowman at Burgess & Niple, Inc. at megan.bowman@burgessniple.com.
- 2.3. Complete sets of Bidding Documents must be used in preparing Bids; neither OWNER nor ENGINEER/ARCHITECT assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.4. OWNER and ENGINEER/ARCHITECT in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

3. QUALIFICATION OF BIDDERS

Each BIDDER must submit with their Bid, an experience record form (Section 00 45 13) with at least three projects listed that are similar to this project in size and scope.

- 3.1. To further demonstrate qualifications to perform the Work, each BIDDER must be prepared to submit within 5 days after an OWNER's request for detailed written evidence such as financial data, previous experience, present commitments, subcontractor capabilities or experience, and other such data.
- 3.2. Each Bid must contain evidence of BIDDER's qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the Contract.
- 3.3. The CONTRACTOR's state license number must be included where applicable.
- 3.4. Each BIDDER must be registered as a plan holder with the Issuing Office as noted in paragraph 2.2 above.

3.5. Drug-Free Workplace Program.

- 3.5.1. During the Contract Time, the Contractor and each Subcontractor shall be enrolled in and good standing in the Drug-Free Workplace (DFWP) Program or a similar program approved by the Ohio Bureau of Workers' Compensation.
- 3.5.2. Contractors must enroll in a certified program and provide verification within ten days of the bid opening or bid will be deemed nonresponsive.

4. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

4.1. It is the responsibility of each BIDDER before submitting a Bid:

- 4.1.1. To examine thoroughly the Contract Documents and other related data identified in the Bidding Documents (including appendices);
- 4.1.2. To visit the site to become familiar with and satisfy BIDDER as to the general, local, and site conditions that may affect cost, progress, performance, or furnishing of the Work;
- 4.1.3. To consider federal, state, and local Laws and Regulations that may affect cost, progress, performance, or furnishing of the Work;
- 4.1.4. To study and carefully correlate BIDDER's knowledge and observations with the Contract Documents and such other related data; and
- 4.1.5. To promptly notify ENGINEER/ARCHITECT of all conflicts, errors, ambiguities, or discrepancies which BIDDER has discovered in or between the Contract Documents and such other related documents and/or site conditions.

4.2. BIDDER may review, if available, those reports of explorations and tests of subsurface conditions at or contiguous to the site that have been utilized by the ENGINEER/ARCHITECT in preparation of the Contract Documents.

Copies of such reports and drawings will be made available by the OWNER to any BIDDER on request.

- 4.3. Provisions concerning responsibilities for the adequacy of data furnished to prospective BIDDERS with respect to subsurface conditions, other physical conditions and underground facilities, and possible changes in the Contract Documents due to differing or unanticipated conditions appear in paragraphs 5, 8, 11, and 14 of the "General Provisions."
- 4.4. Before submitting a Bid, each BIDDER will be responsible to obtain such additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the site or otherwise, which may affect cost, progress, performance, or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by BIDDER and safety precautions and programs incident thereto or which BIDDER deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of the Contract Documents.
- 4.5. On request, OWNER will provide each BIDDER access to the site to conduct such examinations, investigations, explorations, tests, and studies as each BIDDER deems necessary for submission of a Bid. BIDDER shall notify all underground utilities and must fill all holes and clean up and restore the site to its former conditions upon completion of such explorations,

investigations, tests, and studies. The BIDDER assumes all liability from damages resulting from such examination, investigation, exploration, tests, and studies. The schedule for such investigations shall be approved by the OWNER.

- 4.6. The submission of a Bid will constitute an incontrovertible representation by the BIDDER that the BIDDER has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and applying the specific means, methods, techniques, sequences or procedures of construction (if any) that may be shown or indicated or expressly required by the Contract Documents that BIDDER has given ENGINEER/ARCHITECT prompt written notice of all conflicts, errors, ambiguities, and discrepancies that the BIDDER has discovered in the Contract Documents, and the written resolution thereof by ENGINEER/ARCHITECT is acceptable to BIDDER, and that the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.
- 4.7. The provisions of 4.1 through 4.7, inclusive, do not apply to asbestos, polychlorinated biphenyls (PCBs), petroleum, hazardous waste, or radioactive material unless identified in the Contract Documents. If these materials are not identified by the Contract Documents, provisions for handling them shall be in accordance with paragraph 11 of the "General Provisions."

5. INTERPRETATIONS AND ADDENDA

- 5.1. All questions about the meaning or intent of the Bidding and Contract Documents are to be directed to the ENGINEER/ARCHITECT in writing. Interpretations or clarifications considered necessary by the ENGINEER/ARCHITECT in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by the ENGINEER/ARCHITECT as having received the Bidding Documents. Questions received less than 8 days prior to the date for opening of Bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 5.2. Addenda may also be issued to modify the Bidding Documents as deemed advisable by the OWNER or the ENGINEER/ARCHITECT.

6. CONTRACT TIMES

The number of days within which the Work is to be completed and ready for final payment (the term "Contract Times" is defined in paragraphs 20 and 22 of the "General Provisions") is set forth in the Agreement (or incorporated therein by reference to the attached Bid Form).

7. LIQUIDATED DAMAGES

Provisions for liquidated damages, if any, are set forth in the Agreement on General Provisions.

8. SUBSTITUTE AND “OR EQUAL” ITEMS

The Contract, if awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or “or equal” items. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or “or equal” item of material or equipment may be furnished or used by the CONTRACTOR if acceptable to the ENGINEER/ARCHITECT, application for such acceptance will not be considered by the ENGINEER/ARCHITECT until after the Effective Date of the Agreement.

9. SUBCONTRACTORS, SUPPLIERS, AND OTHERS

BIDDERS shall submit the identity of any subcontractors, suppliers, or others who may be contracted with by the CONTRACTOR during the course of the project on the Proposed Subcontractors form (Section 00 43 36).

10. BID FORM

- 10.1. The Bid Form is included with the Bidding Documents and the Bid prices must be entered therein, in figure only. In all items, Bids must be made separately on labor and material and the total price for each unit shall be the “Total (Sum of Labor and Material).” In the event of math errors on the Bid Schedule, the “Labor” and “Material” columns will be assumed to be correct and the remaining math will be corrected accordingly. Bids will then be evaluated using the corrected figures.
- 10.2. All blanks on the Bid Form must be completed by printing or typing on the original forms from the Issuing Office.
- 10.3. Bids by corporations must be executed in the corporate name by the president or a vice president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature.
- 10.4. Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.
- 10.5. All names must be typed or printed below the signature.
- 10.6. The Bid shall contain an acknowledgement of receipt of all Addenda (the numbers of which must be filled in on the Bid Form).
- 10.7. The address, telephone number, and facsimile number for communications regarding the Bid must be shown.
- 10.8. Evidence of authority to conduct business as an out-of-state corporation in the state where the Work is to be performed shall be provided in accordance with paragraph 3, “Qualifications of BIDDERS.” State CONTRACTOR license number, if any, must also be shown.

- 10.9. The BIDDER is required to execute and submit a Noncollusion Affidavit (Section 00 45 19) with the Bid.
- 10.10. The successful BIDDER will be further required to furnish the OWNER with a complete breakdown of the lump sum Bid items, to the satisfaction of the ENGINEER/ARCHITECT, before signing the Contract Documents. The lump sum breakdown shall be in sufficient detail to provide a check of claims for partial payment requests.
- 10.11. The quantities listed in the Bid are to be considered as approximate and are to be used only for the comparison of the Bids and as a basis for computing amounts of security or penal sums of Bonds to be furnished. The unit prices to be tendered by the BIDDERS are to be tendered expressly for the scheduled quantities and as they may be increased or decreased by duly authorized Change Order. Payments, except for lump sum Bids, and except for the lump sum items in unit price Bids, will be made to the CONTRACTOR for the actual quantities only of Work performed or materials furnished in accordance with the Contract Documents.

11. SUBMISSION OF BIDS

Bids shall be submitted electronically by the time and to the email address indicated in the Advertisement or Invitation to Bid with the Project title and name of BIDDER in the subject line. The bid shall include the bid form and other required documents.

12. MODIFICATION AND WITHDRAWAL OF BIDS

- 12.1. Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.
- 12.2. If within the time specified by law, any BIDDER files a duly signed, written notice with OWNER and promptly thereafter demonstrates to the reasonable satisfaction of the OWNER that there was a material and substantial mistake in the preparation of its Bid, that BIDDER may withdraw its Bid by written notification to the Owner. Thereafter, that BIDDER will be disqualified from further bidding on the Work to be provided under the Contract Documents.

13. OPENING OF BIDS

Bids will be opened (unless obviously nonresponsive) by the Park District. An abstract of the amounts of the base Bids and major alternates (if any) will be made available to BIDDERS within 72 hours after the opening of Bids.

14. BIDS TO REMAIN SUBJECT TO ACCEPTANCE

All Bids will remain subject to acceptance for 60 days after the day of the Bid opening, but OWNER may, in its sole discretion, release any Bid prior to that date. Should there be any reasons why the Contract cannot be awarded within the specified period, the time may be extended in writing by mutual agreement between the OWNER and the BIDDER. If the Contract is to be awarded, OWNER will give successful BIDDER a Notice of Award within 60 days after the date of the Bid unless the time is extended by mutual agreement between the OWNER and the BIDDER.

15. AWARD OF CONTRACT

- 15.1. OWNER reserves the right to reject any or all Bids, including without limitation the rights to reject any or all nonconforming, nonresponsive, unbalanced, or conditional Bids and to reject the Bid of any BIDDER if OWNER believes that it would not be in the best interest of the Project to make an award to that BIDDER, whether because the Bid is not responsive or the BIDDER is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by OWNER. OWNER also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful BIDDER. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.
- 15.2. In evaluating Bids, OWNER will consider the qualifications of BIDDERS, whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 15.3. OWNER may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work as to which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Supplementary Conditions. OWNER may also consider the operating costs, maintenance requirements, performance data, and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.
- 15.4. OWNER may conduct such investigations as OWNER deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications, and financial ability of BIDDERS, proposed Subcontractors, Suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to OWNER's satisfaction within the prescribed time.
- 15.5. If the Contract is to be awarded, it will be awarded to lowest BIDDER whose evaluation by OWNER indicates to OWNER that the award will be in the best interests of the Project.

16. CONTRACT SECURITY

Not Required.

17. SIGNING OF AGREEMENT

When OWNER gives a Notice of Award to the Successful BIDDER, it will be accompanied by the required number of unsigned counterparts of the Agreement. Within 10 days thereafter CONTRACTOR shall sign and deliver the required number of counterparts of the Agreement To OWNER with the required Bonds. Within 20 days thereafter OWNER shall deliver two fully signed counterparts to CONTRACTOR.

18. PROTEST PROCEDURE

- 18.1. A protest based upon an alleged violation of the procurement requirements may be filed against the OWNER's procurement action by a party with an adversely affected direct financial interest. The protest shall be filed with the OWNER. The OWNER shall determine the validity of the protest. The OWNER may request additional information or a hearing in order to resolve the protest.
- 18.2. A protest shall be filed as early as possible during the procurement process, but must be received by the OWNER no later than 1 week after the basis of the protest is known or should have been known, whichever is earlier. If the protest is mailed, the protestor bears the risk of nondelivery within the required time period.
- 18.3. A protest must clearly present the procurement requirement being protested, the procurement regulation in alleged noncompliance, the facts which support the protest, and any other information necessary to support the protest.

SCOPE OF BIDS

MARION COUNTY PARK DISTRICT

TALLGRASS MAINTENANCE/ STORAGE FACILITY

COMPLETE FACILITY

It is understood and agreed that the CONTRACTOR has, by careful examination, satisfied himself as to the nature and location of the work; the conformation of the ground; the character, quality, and quantity of the materials to be encountered; the character or equipment and facilities needed preliminary to and during the prosecution of the work; the general and local conditions; and all other matters which can, in any way, affect the work under this Contract.

All known structures, pipelines, and utilities have been indicated in their approximate locations on the plans, and any reasonable variation in size and location of structures and pipe shall not be cause for extra payment.

The CONTRACTOR shall verify the rating and electrical demands of the equipment he proposes to furnish and shall provide for any necessary electrical changes to accommodate the equipment furnished at no change in Contract Price.

If construction procedures and equipment being utilized by the CONTRACTOR prove to be inadequate in the performance of the Contract, the procedures and equipment shall be modified or alternative equipment shall be furnished and used at no additional cost to the OWNER.

The CONTRACTOR will be responsible for obtaining and paying all costs associated with any telephone service he may require during the Contract period. The CONTRACTOR will be responsible for supplying, maintaining, and paying all costs associated with all temporary and permanent utility services as required for plant operation and construction of the Work; maintaining influent and effluent to the existing plant until the plant is operational. The CONTRACTOR shall pay the monthly costs associated with electrical service throughout the Contract Time including facility testing and start-up until the project reaches substantial completion.

The price Bid shall include the following:

1. All labor, materials, and equipment in accordance with Article 6 of the General Conditions.
2. All field staking necessary for construction from control points established by the ENGINEER/ARCHITECT.
3. All assistance required by the ENGINEER/ARCHITECT to verify compliance with the Contract Documents, including measuring for quantities.
4. ENGINEER's/ARCHITECT's field office as specified.

All BIDDERS must Bid Items 1 through 4 inclusive.

Item 1 – Maintenance/ Storage Facility Complete, Except Items 2 through 4. This lump sum Bid shall include furnishing all labor, tools, equipment, and materials necessary to complete the maintenance/storage facility project as shown or specified on the plans. This work does not include the Maintenance/ Storage Building, electrical light and power for the facility, and gravel walks and drives.

Payment will be made in accordance with the General Conditions at the lump sum price bid for this item.

Item 2 – Maintenance/ Storage Building, Less Electrical. This lump sum Bid shall include furnishing all labor, tools, equipment, and materials necessary to furnish and install the maintenance/storage building with the sub-slab vapor mitigation system as shown on the plans except for the electrical power supply and lighting. This work includes all structural foundations, walls, doors, roofs, ventilation, and vapor mitigation.

Payment will be made in accordance with the General Conditions at the lump sum price bid for this item.

Item 3 – Gravel Walks. This item shall include excavation and disposal of excavated material; furnishing, placing, and compacting the gravel walks; and all else required to construct the walkways from the Tallgrass Trail to the maintenance building from the existing gravel road in accordance with the Contract Documents.

Measurement for payment will be made on the actual amount of gravel placed and accepted. Payment will be made on a square foot basis on the quantity determined from the measurements specified above. Unauthorized construction of walkway widths beyond those established by the ENGINEER/ARCHITECT will not be eligible for payment.

Item 4 – Electrical Lights and Power. This lump sum Bid shall include furnishing all labor, tools, equipment, and materials necessary to build and install the electrical lights, electrical circuitry, and power supply to the maintenance/storage facility.

Payment will be made in accordance with the General Conditions at the lump sum price bid for this item.

Alternate Bid Item A – Gravel Drives. This item shall include excavation and disposal of excavated material; furnishing, placing, and compacting the gravel drives; and all else required to construct the driveways from the Tallgrass Trail to the maintenance building from the existing gravel road in accordance with the Contract Documents.

Measurement for payment will be made on the actual amount of driveway placed and accepted. Payment will be made on a square foot basis on the quantity determined from the measurements specified above. Unauthorized construction of driveway widths beyond those established by the ENGINEER/ARCHITECT will not be eligible for payment.

BID FORM

PROJECT IDENTIFICATION:

Tallgrass Trail Maintenance/ Storage Facility

THIS BID IS SUBMITTED TO:

Marion County Park District

(Name and Address of OWNER):

222 W. Center Street, Marion, OH 43302

EMAIL:

marioncountyparkdistrict@gmail.com

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents to perform and furnish all work as specified or indicated in the Contract Documents for the amount Bid and within the time indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.
2. BIDDER accepts all of the terms and conditions of Section 00 11 13, "Advertisement for Bids," and Section 00 21 13, "Instructions to Bidders."
3. This Bid will remain subject to acceptance for 60 days after the day of Bid opening.
4. BIDDER will sign and submit the Agreement with the Bonds and the other contract forms as listed on the table of contents within 10 days after the date of OWNER's Notice of Award.
5. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:
 - a. BIDDER has examined copies of all the Bidding Documents and of the following Addenda (receipt of all which is hereby acknowledged):

Date	Addendum Number(s)	Bidder Initials
_____	_____	_____
_____	_____	_____
_____	_____	_____

- b. This Bid is genuine and not made in the interest or on behalf of any undisclosed person, firm, or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation; BIDDER has not directly or indirectly induced or solicited any other BIDDER to submit a false or sham Bid;

BIDDER has not solicited or induced any person, firm, or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other BIDDER or over OWNER.

6. BIDDER will complete the work for the following price(s):

BID SCHEDULE**TALLGRASS TRAIL MAINTENANCE/ STORAGE FACILITY
COMPLETE FACILITY**

BIDDER agrees to perform all the work described in the Contract Documents for the following unit prices:

(1) Item	(2) Description	(3) Quantity	(4) Unit	Unit Prices in Figures		(7 = 5 + 6) Total (Sum of Labor and Material)	(8 = 3 x 7) Total Extended Informal Price in Figures
				(5) Labor	(6) Material		
1.	Maintenance/ Storage Facility Complete Except Items 2 through 4	1	l.s.				
2.	Maintenance/ Storage Building	1	l.s.				
3.	Gravel Walks	216	s.f.				
4.	Electric Lights and Power	1	l.s.				

Informal Base Bid (Total of Items 1 Through 4) \$_____

Alternate Bid Item A – Gravel Drive

(1) Item	(2) Description	(3) Quantity	(4) Unit	Unit Prices in Figures		(7 = 5 + 6) Total (Sum of Labor and Material)	(8 = 3 x 7) Total Extended Informal Price in Figures
				(5) Labor	(6) Material		
Alt-A	Gravel Drive	592	s.f.				

BID SCHEDULE (Continued)

Total of Base Bid plus Alternate Items (Items 1 Through 4 plus Alt-A) \$_____

Respectfully submitted:

_____	_____
Name of Contractor	Address
_____	_____
Signature	Date
_____	_____
Title	Phone Number

(Seal - if Bid is by a corporation)

Attest _____

7. Quantities are not guaranteed. Final payment will be based on actual quantities as provided in the Contract Documents.

8. BIDDER agrees that the work

will be complete and ready for final payment within 160 calendar days after the date when the Contract time commences to run, as provided in paragraphs 20, 21, and 22 of the General Provisions.

9. BIDDER agrees to pay as liquidated damages (in the event of failure to complete the work ready for final payment within the times specified in the Agreement) the sum of \$100 for each consecutive calendar day as provided in the Agreement.

10. The following documents are attached to and made a condition of this Bid:

a. All the procurement forms listed in Section 00 01 09, "Table of Contents."

11. Communications concerning this Bid shall be addressed to:

The address of BIDDER indicated below.

Phone _____

Fax _____

SUBMITTED on _____, 20__

If BIDDER is:

An Individual

By _____

(Individual's Signature and Typed Name)

doing business as _____

Business address: _____

Phone No.: _____

A Partnership

By _____ (SEAL)

(Firm Name)

(General Partner Signature and Typed Name)

Business address: _____

Phone No.: _____

A Corporation

By _____ (CORPORATE SEAL)

(Corporation Name)

(State of Incorporation)

By: _____
(Typed Name and Signature of Person Authorized to Sign)

(Title)

(Corporate Seal)

Attest _____
(Signature of Secretary)

Business address: _____

Phone No.: _____

Miscellaneous

Federal Taxpayer Identification Number _____

PROPOSED SUBCONTRACTORS

The BIDDER is required to state the Subcontractors proposed to be utilized in the Work. Provide name, address, telephone number, and amount of subcontract. (Enter NONE, where work will be performed by the BIDDER.) Failure to list Subcontractors here may result in rejection of the Bid.

Electrical

Vapor Mitigation

HVAC

EXPERIENCE RECORD

The BIDDER is required to state the character of previous work, give references, and such other detailed information as will enable the OWNER to determine responsibility, including experience, skill, and financial standing. Projects listed shall be for OWNERS other than this Project and ENGINEERS/ARCHITECTS other than Burgess & Niple, Inc. Use additional copies of this form as required.

PROJECT NAME: _____

ENGINEER: _____ OWNER: _____

PERSON TO CONTACT: _____

PHONE: (____) _____ ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

CONTRACT VALUE: _____

DATE STARTED/COMPLETED: _____

DESCRIPTION: _____

PROJECT NAME: _____

ENGINEER: _____ OWNER: _____

PERSON TO CONTACT: _____

PHONE: (____) _____ ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

CONTRACT VALUE: _____

DATE STARTED/COMPLETED: _____

DESCRIPTION: _____

PROJECT NAME: _____

ENGINEER: _____ OWNER: _____

PERSON TO CONTACT: _____

PHONE: (____) _____ ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

CONTRACT VALUE: _____

DATE STARTED/COMPLETED: _____

DESCRIPTION: _____

NONCOLLUSION AFFIDAVIT

The BIDDER is required to execute and submit with his Bid, the Noncollusion Affidavit.

State of _____
County of _____

Bid Identification _____

CONTRACTOR _____ being first
duly sworn, deposes and says that he is _____ (sole owner, a partner,
president, secretary, etc.) of _____,
the party making the foregoing Bid; that such Bid is not made in the interest of or on behalf of any
undisclosed person, partnership, company, association, organization, or corporation; that such Bid is
genuine and not collusive or sham; that said BIDDER has not directly or indirectly induced or solicited
any other BIDDER to put in a false or sham Bid, and has not directly or indirectly colluded, conspired,
connived, or agreed with any BIDDER or anyone else to put in a sham Bid, or that anyone shall refrain
from bidding; that said BIDDER has not in any manner, directly or indirectly, sought by agreement,
communication or conference with anyone to fix the Bid price of said BIDDER or of any other BIDDER,
or to fix any overhead, profit, or cost element of such Bid price, or of that of any other BIDDER, or to
secure any advantage against the OWNER awarding the Contract or anyone interested in the proposed
Contract; that all statements contained in such Bid are true; and, further, that said BIDDER has not,
directly or indirectly, submitted his Bid price or any breakdown thereof, or the contents thereof, or
divulged information or data relative thereto, or paid and will not pay any fee in connection therewith, to
any corporation, partnership, company, association, organization, Bid depository, or to any member or
agent thereof, or to any other individual except to such person or persons as have a partnership or other
financial interest with said BIDDER in his general business.

Signed:

Subscribed and sworn to before me this

_____ day of _____, 20__.

Seal of Notary

(Signature of Notary)

NOTICE OF AWARD

To: _____ Date: _____, 20__

Project Description: _____

The OWNER has considered the Bid submitted by you on _____, 20__ (Bid Date) for the above described work in response to its Advertisement for Bids and Instructions to Bidders.

You are hereby notified that your Bid has been accepted for items in the amount of \$_____.

You are required by the Instructions to Bidders to execute the Agreement and furnish the required CONTRACTOR's Bonds (if applicable) and Certificates of Insurance within 10 calendar days from the date of this notice to you.

If you fail to execute said Agreement and to furnish said Bonds within 10 calendar days from the date of this notice, said OWNER will be entitled to consider all your rights arising out of the OWNER's acceptance of your Bid as abandoned and as a forfeiture of your Bid Bond. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the OWNER.

ACCEPTANCE OF NOTICE

Receipt of the above Notice of Award is hereby acknowledged

OWNER

By _____
CONTRACTOR

By _____

this the _____ day of
_____ 20__

Name _____

Title _____

By _____

Name _____

Title

Copy: Contractor's Surety
Surety's Agent

AGREEMENT

THIS AGREEMENT is dated as of the _____ day of _____ in the year 2025 by and between Marion County Park District (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR).

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

Article 1. WORK.

CONTRACTOR shall complete all work as specified or indicated in the Contract Documents. The work is generally described as follows:

Site development of a new 675 square foot maintenance/ storage building complete with paving, building foundation and shell, and electrical together with the necessary appertaining work.

The project for which the work under the Contract Documents may be the whole or only a part is generally described as follows:

Maintenance/ Storage Facility Complete.

Article 2. ENGINEER/ARCHITECT.

For this agreement, the ENGINEER/	Burgess & Niple, Inc.
ARCHITECT is designated as:	330 Rush Alley, Ste 700, Columbus, Ohio 43215

who is hereinafter called ENGINEER/ARCHITECT and who is to act as OWNER's representative, assume all duties and responsibilities, and have the rights and authority assigned to ENGINEER/ARCHITECT in the Contract Documents in connection with completion of the work in accordance with the Contract Documents.

Article 3. CONTRACT TIME.

3.1. The work will be completed and ready for final payment within 160 calendar days after the date when the Contract Time commences to run, as provided in the Notice to Proceed and in paragraph 20 and 21 of the General Provisions.

3.2. **LIQUIDATED DAMAGES.**

1. OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the work is not completed within the time specified in paragraph 3.1 above, plus any extensions thereof allowed in accordance with Paragraph 22 of the General Provisions.

2. They also recognize the delays, expense, and difficulties involved in proving the actual loss suffered by OWNER if the work is not completed on time.
3. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty), CONTRACTOR shall pay OWNER the sum of \$100 for each consecutive calendar day that expires after the time specified in paragraph 3.1, or any proper extension thereof granted by OWNER for completion and readiness for final payment.

Article 4. CONTRACT PRICE. OWNER shall pay CONTRACTOR for completion of the work in accordance with the Contract Documents in current funds of \$_____, in accordance with the Bid Schedule as awarded by the OWNER as included herein, subject to additions and deductions by Change Order and quantities actually performed.

Article 5. PAYMENT PROCEDURES.

- 5.1 **APPLICATION FOR PAYMENT.** CONTRACTOR shall submit Applications for Payment in accordance with paragraphs 18 and 19 of the General Provisions. Applications for Payment will be processed by ENGINEER/ARCHITECT as provided in the General Provisions.
- 5.2 **PROGRESS PAYMENTS.** OWNER shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment as recommended by ENGINEER/ARCHITECT monthly during construction as provided in the General Provisions. All progress payments will be on the basis of the progress of the work measured by the schedule of values established by the Contractor and approved by the Owner (and in the case of Unit Price work based on the number of units completed).
- 5.3 **FINAL PAYMENT.** Upon final completion and acceptance of the work in accordance with paragraph 21 of the General Provisions, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER/ARCHITECT as provided in said paragraphs 18 and 19.

Article 6. INTEREST. All monies not paid when due as provided in the General Provisions shall bear interest at the rate provided by law at the place of the project.

Article 7. CONTRACTOR'S REPRESENTATIONS. In order to induce OWNER to enter into this Agreement, CONTRACTOR makes the following representations:

- 7.1. CONTRACTOR has examined and carefully studied the Contract Documents (including the Addenda listed in paragraph 8) and the other related data identified in the Bidding Documents including "technical data."
- 7.2. CONTRACTOR has visited the site and become familiar with and is satisfied as to the general, local, and site conditions that may affect cost, progress, performance, or furnishing of the work.
- 7.3. CONTRACTOR is familiar with and is satisfied as to all federal, state, and local laws and regulations that may affect cost, progress, performance, and furnishing of the work.

- 7.4. CONTRACTOR has examined and agreed with provisions concerning responsibilities for the adequacy of data furnished to prospective BIDDERS with respect to subsurface conditions, other physical conditions and underground facilities, and possible changes in the Contract Documents due to differing or unanticipated conditions appear in paragraph 11 of the "General Provisions."
- 7.5. CONTRACTOR has obtained and carefully studied (or assumes responsibility for having done so) all such additional supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance, or furnishing of the work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto.
- 7.6. CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the site that relates to the work as indicated in the Contract Documents.
- 7.7. CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.
- 7.8. CONTRACTOR has given ENGINEER/ARCHITECT written notice of all conflicts, errors, ambiguities, or discrepancies that CONTRACTOR has discovered in the Contract Documents and the written resolution thereof by ENGINEER/ARCHITECT is acceptable to CONTRACTOR, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

Article 8. CONTRACT DOCUMENTS. The Contract Documents which comprise the entire agreement between OWNER and CONTRACTOR concerning the work consist of the following:

- 8.1. This Agreement.
- 8.2. Exhibits to this Agreement.
- 8.3. Procurement and Contracting Requirements, Specifications and Supplemental Specifications as listed in Section 00 01 09, "Table of Contents," from Division 0 through Division 48 prepared or issued by Burgess & Niple, Inc., dated April 2025 and revised _____ 2025.
- 8.4. Drawings prepared by Burgess & Niple, Inc., Sky Architects, dated April 2025 and revised _____, 20 ____.

8.5. ADDENDA:

No. _____, dated _____, 20____
No. _____, dated _____, 20____
No. _____, dated _____, 20____
No. _____, dated _____, 20____
No. _____, dated _____, 20____
No. _____, dated _____, 20____

8.6. All completed forms including procurement forms and contract forms as listed in Section 00 01 09, "Table of Contents."

Article 9. MISCELLANEOUS.

- 9.1. No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.
- 9.2. OWNER and CONTRACTOR each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect of all covenants, agreements, and obligations contained in the Contract Documents.
- 9.3. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed _____ copies of this Agreement. _____ counterparts each have been delivered to OWNER, CONTRACTOR, and ENGINEER/ARCHITECT.

The effective date of this Agreement shall be _____, 20__.

OWNER:

By _____
Name _____
Title _____

(SEAL)

ATTEST:

By _____
Name _____
(Please Type or Print)
Title _____

Address for giving notices

CONTRACTOR:

By _____
Name _____
Title _____
Address _____

Telephone _____
Employer Identification No. _____
Contractor's License No. _____
(If a corporation, a second officer must sign.)
By _____
Name _____
(Please Type or Print)
Title _____

(SEAL)

ATTEST:

By _____
Name _____
(Please Type or Print)
Title _____

Address for giving notices

(If CONTRACTOR is a corporation, attach
evidence of authority to sign.)

NOTICE TO PROCEED

To: _____ Date: _____

Project Description: _____

You are hereby notified to commence work in accordance with the Agreement dated _____, 20__, on or before _____, 20__, and you are to complete the work within _____ calendar days thereafter. The date of completion of all work is therefore _____, 20__.

You are required to return an acknowledged copy of this Notice to Proceed to the OWNER.

OWNER
By _____
Name _____
Title _____

ACCEPTANCE OF NOTICE

Receipt of the above Notice to
Proceed is hereby acknowledged

By _____
CONTRACTOR

this the _____ day of
_____, 20__

By _____
Name _____
Title _____

GENERAL PROVISIONS

1. Definitions

If the words **Marion County Park District or Park District** are used or implied in the specifications, it shall refer to **the Owner as defined in the Agreement between Owner and Contractor**, or any agent, architect or engineer or authorized by the Owner.

Whenever the word "**Contractor**" is used or implied in these specifications, it shall refer to the Contractor, partnership, firm of contractors, or their subcontractor, undertaking a contract for these specifications, hereby referred to in the contract as the party of the second part.

2. Authority of Owner

The Owner shall have full authority to do any or all of the following things:

Interpret Plans, etc.-- to interpret the meaning of the plan and specifications when necessary and to decide all questions that may arise relative to the fulfillment of this Contract.

Judge of Quality.-- To be the sole judge of the quality and fitness of all material and workmanship; to supervise all tests; to inspect all work and material at the factory, on the grounds or after placing in the ground; and to reject any work or material which, in Owner' judgment does not fully conform to the plans and specifications.

Power to Reject.—Owner may so reject faulty work or material at any time prior to the final acceptance of the work, notwithstanding that it may have been previously overlooked or may have become damaged after previous inspection, even though it may have been estimated or paid for. Any rejected work shall be rejected material and shall be removed from the job by the Contractor and not returned to any part of the work.

Enforce Laws.--To enforce all laws, rules and regulations and requirements of the plans and specifications, including such detailed plans as prepared during construction.

Judge Foundation Material.--To judge the suitability of all foundations and to order unsuitable foundation material excavated to such depths as Owner considers necessary and the excavation refilled in such manner and with such material as Owner may deem proper.

Fix Time and Place of Work.--To fix the time and place where work shall be started and carried on, and to order the work carried on simultaneously at two or more points if Owner deems necessary.

Length of Trench.--To determine the length of trench which shall be kept open at any time.

Precaution Against Damage.--To require additional precautions against damage or accident of any and all kinds, whether to the work, the public, or any public or private property. This power shall not, however, relieve the Contractor of any responsibility for providing proper safeguards, or for any such damage or accident.

Extra Work.--To sign and give orders for extra work, when such work if necessary, under the provisions of this Contract.

Cleaning Up.--To order all dirt, rubbish and other material cleaned up immediately after backfilling and to have such cleaning done at the expense of the Contractor in case such order is not complied with within three days.

Discharge Employees.--To order the Contractor to discharge any employee who is disorderly or disrespectful or who persistently does careless or unsatisfactory work.

Stop Work.--To stop the work if any provision of the contract or specifications is being violated.

Assistants.--To deputize assistants and inspectors to act for Owner in any of its powers and duties and such assistants and inspectors shall exercise all powers of the Owner within the limits of the specific authority given by Owner to each.

Amount and Quality.--To determine the amount and quality of the several kinds of work which are to be paid for hereunder, including extra work.

Monthly Estimates.--To prepare and sign approximate monthly estimates.

Final Estimates.--To examine the work when notified of its completion and, if fully completed to Owner' satisfaction, make the necessary measurements and prepare and sign the final estimate.

Violation of Contract.--To notify the Contractor in writing of any violation of the Contract.

Extension of Time.--To determine the proper length of any extension of time provided for under this Contract.

3. Owner to Give Instructions

It is mutually agreed that wherever in this Contract the words "as directed", as required", "permitted", 'approval", "suitable", ordered, "proper", "satisfactory, or words of similar import are used, they shall be understood to refer to the instructions and judgment of the Owner as applied to each particular case.

4. Designated Representative

The Owner shall identify a representative authorized to act on the Owner's behalf with respect to the Project. Owner may change the representative upon written notice to the Contractor, and the Owner may modify the scope of authority of the representative in like manner.

5. Plans and Specifications

The drawings are the graphic and pictorial portions of the Project showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams, and the Specifications are that portion of the contract documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services, as may be furnished by the Owner. Work shown on the plans and not mentioned in the specifications, or vice versa, shall be done as if shown on both, and should any actual or apparent conflicts, inconsistencies or errors be found the Contractor shall notify the Owner as soon as they are discovered and shall not proceed with any work affected thereby until the matter has been properly clarified or corrected by the Owner.

6. Work to be Complete

The intent of these specifications is to provide for the work herein outlined to be full and complete in every detail for the purpose designated, and the Contractor hereby agrees to furnish everything necessary and reasonably inferable for such construction, notwithstanding any omissions or errors in the Contract Documents.

7. Employ Only Competent Persons

The Contractor shall employ only competent and skillful persons to do the work and whenever the Owner shall inform him that any person on the work is, in Owner's opinion, incompetent, unfaithful, or disorderly, or is refusing to carry out the provision of the Contract, or who persistently does careless or unsatisfactory work, or uses disrespectful, threatening or abusive language to any official having supervision of the work or to the public, such person shall be discharged from the work, and shall not again be employed without the written consent of the Owner.

8. Responsibility of Contractor

A. The Contractor shall assume full responsibility for the work, shall bear all losses resulting to him on account of the amount or character of the work, or from any unforeseen delays, obstructions or difficulties which may be encountered, or because the nature of the ground, earth or rock in or on which the work is to be done, is different from what is assumed or was expected, or on account of the weather, floods or other causes.

B. The Contractor shall indemnify and hold harmless the Owner and the Owner's design professionals, and agents and employees of them from and against claims, damages, fines, penalties, punitive damages, losses and expenses, including but not limited to attorneys' and consultants' fees and the cost of their staff, arising out of or related to the Contractor's performance of the Work and its obligations under the Contract, including but not limited to claims for bodily injury, sickness, disease or death, or to injury to or destruction of or loss of use of real or personal property, claims due to delays in or acceleration of the work of separate contractors, claims for loss of productivity, claims for additional storage and handling charges, claims for escalation of the cost of labor and materials, claims for home office overhead, liens, attested accounts, and claims related to the removal, handling or use of hazardous materials. Without limiting any other remedy that may be available to it, the Owner may set off an amount equal to the sums for which it is entitled to be indemnified from the amounts otherwise due the Contractor under the Contract Documents. In claims against any person or entity indemnified under this Section by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this Section not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

C. During the progress of the work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the contract documents or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the contract documents, are encountered at the site, notify the Project Manager of the specific differing conditions before they are disturbed or the affected work is performed. Upon notification, the Project Manager will investigate the conditions and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the contract, Owner will make an adjustment and modify the contract. The Project Manager will notify the Contractor of the determination whether or not an adjustment of the Contract is warranted.

9. Contractor's Construction Schedule

The Contractor is responsible for scheduling the Work and coordinating the subcontractors. The Contractor, prior to commencement of the Work, shall submit for the Owner's approval a construction schedule for the Work. The schedule shall not exceed time limits established under the Contract Documents, shall be related to the entire Project, shall allow the Owner reasonable time to review submittals, and shall provide for expeditious and practicable execution of the Work. The Owner reserves the right to withhold progress payments to Contractor without a schedule approved by the Owner. The Contractor shall provide periodic progress reports as requested to the Owner which shall include recommendations for adjusting the construction schedule to meet milestone completion, Substantial Completion and final completion dates. In the event that critical path activities, schedule milestone completion dates, Substantial Completion or final completion dates will not be met, Contractor shall devise an affirmative time recovery plan acceptable to the Owner to avoid or minimize any delay.

10. Unit Prices

The Contractor agrees that the Owner may increase, decrease or delete entirely the scheduled quantities of Work to be done and materials to be furnished after execution of the Contract. Payments based on a Unit Price will be made to the Contractor only for the actual quantities of Work performed or materials furnished in accordance with the Contract Documents. If the cost of an item for which a Unit Price is stated in the Contract changes substantially so that application of the Unit Price to the quantities of Work proposed will create an undue hardship on the Owner or the Contractor, the applicable Unit Price may be equitably adjusted by Change Order.

11. Changes in the Work

A. By appropriate Modification, changes in the Work may be accomplished after execution of the Contract. The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, with the Contract Sum and Contract Time being adjusted accordingly. Such changes in the Work shall be authorized by written Change Order signed by the Owner and Contractor, or by written Construction Change Directive signed by the Owner and issued to the Contractor.

B. Adjustments in the Contract Sum and Contract Time resulting from a change in the Work shall be determined by mutual agreement of the parties or, in the case of a Construction Change Directive signed only by the Owner, by agreed upon unit prices and the Contractor's cost of labor, material, equipment (except that Contractor shall not include transportation costs exceeding 100 miles) and reasonable overhead and profit (not to exceed 15%), unless the parties agree on another method for determining the cost or credit. Pending final determination of the total cost of a Construction Change Directive, the Contractor may request payment for Work completed pursuant to the Construction Change Directive. The Owner will make an interim determination of the amount of payment due for purposes of certifying the Contractor's monthly application for payment. When the Owner and Contractor agree on adjustments to the Contract Sum and Contract Time arising from a Construction Change Directive, the Owner will prepare a Change Order. The Contractor shall proceed diligently with the performance of the changes in the Work following receipt of and as set forth in the Construction Change Directive pending Contractor's receipt of a fully executed Change Order.

C. The Owner will have authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not materially inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.

D. Agreement on any Change Order shall constitute a final settlement of all Claims of the Contractor relating to the change in the Work that is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change and any and all adjustments to the Contract Sum and the construction schedule.

12. Owner's Right to Carry Out Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents, and fails within a ten-day period after receipt of written notice from the Owner to correct such default or neglect, the Owner, without prejudice to any other remedy the Owner may have, may correct such deficiencies and may deduct the reasonable cost thereof, including Owner's expenses and compensation for the Owner's services made necessary thereby, from the payment then or thereafter due the Contractor.

13. Subcontractors

A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work and which may include the furnishing of supplies, materials, equipment or services. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

B. A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work and which may include the furnishing of supplies, materials, equipment or services. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor of any tier or an authorized representative of the Sub-subcontractor

C. Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner the names of the Subcontractors or suppliers for each of the principal portions of the Work, the portion of the Work to be performed by the Subcontractor or supplier, and the names, titles and contact information for the principal point of contact for each Subcontractor or supplier. The Contractor shall not contract with any Subcontractor or supplier to whom the Owner has made reasonable written objection within ten days after receipt of the Contractor's list of Subcontractors and suppliers and the Contractor shall engage the services of another subcontractor at no additional cost to Owner. Contractor shall be responsible for the performance of all Work required under this Agreement, regardless of whether it is self-performed by Contractor, a Subcontractor or any lower tier sub-subcontractor, and Contractor shall be responsible for the acts and omissions of its Subcontractors and lower tier sub-subcontractors in the performance of the Work

D. By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner. Each subcontract agreement shall provide that the Owner is a third party beneficiary of the subcontract agreement and shall preserve and protect the rights of the Owner under the Contract Documents with respect to the Work to be performed by the Subcontractor so that

subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors. Contractor shall promptly provide to Owner copies of any agreement between the Contractor and a Subcontractor along with copies of all bids or other proposals from Subcontractors. The subcontract form between the Contractor and a Subcontractor shall meet the applicable requirements of Ohio Administrative Code 153:1-3-01 and 153:1-3-02.

E. Contractor shall pay its Subcontractors on demand, at any time after the Certificate for Payment should otherwise have been issued, provided the Owner's failure to approve is not the fault of a particular Subcontractor and provided the Contractor is not in a bona fide dispute with that Subcontractor affecting payment. Nothing within this Section or in the Contract shall be construed as limiting the Contractor's obligations under Revised Code 4113.61.

14. Permits and Notices

Unless specifically assumed by the Owner, the Contractor shall secure and pay for the building permit as well as other permits, fees, licenses and inspections by government agencies necessary for proper execution and completion of the Work except when building codes or applicable laws or regulations prohibit the Owner from delegating those responsibilities to the Contractor. The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work. If the Contractor performs Work contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

15. Tests and Inspections

Tests, inspections and approvals of portions of the Work required by the Contract Documents or by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities shall be made at an appropriate time. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Owner timely notice of when and where tests and inspections are to be made so that the Owner may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after the date of this Agreement, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating the costs to the Contractor.

16. Night, Saturday, Sunday, or Holiday Work

No work shall be done during the night, or on Sundays, or Holidays, except in case of emergencies or when written permission or order is given. Saturday work must be approved by the Owner or Project Manager.

17. Sanitary Regulations

Sanitary regulations as may be prescribed shall be obeyed and followed by the Contractor without extra charge. Suitable sanitary conveniences and plenty of pure water shall be furnished by the Contractor for the use of employees. Offensive or unsanitary conditions in the trenches or excavations or about the work shall be removed by the Contractor at its own expense.

18. Payments

A. The Contractor shall submit a schedule of values to the Owner within five (5) days following the date of commencement of the Work, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Owner. This schedule, unless objected to by the Owner, shall be used as a basis for reviewing the Contractor's Application for Payment. Any changes to the schedule of values, including changes to the Contract Sum and changes required by the Owner if the Owner subsequently determines the schedule of values to be in any way unreasonable or inaccurate, shall be promptly submitted to the Owner and supported by such data to substantiate its accuracy as the Owner may require, and unless objected to by the Owner, shall be used as a basis for reviewing the Contractor's subsequent Application for Payment. The Contractor shall utilize AIA Document G-703 in submitting its schedule of values unless a different form is designated.

B. The Contractor may submit to the Owner by the 25th of each month an Application for Payment for the completion of work as of that time. Payments for work completed shall be made to the Contractor by the 20th of the following month. Payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment stored, and protected from damage, off the site at a location agreed upon in writing. Contractor shall submit with EACH Application for Payment, including the final Application for Payment, (i) an Affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the previous Application for Payment was submitted have been paid or otherwise satisfied; (ii) a current list of the Subcontractors and suppliers showing their respective contract sums, amounts paid, amounts due; (iii) certified payroll reports of the Contractor and Subcontractors or suppliers as may be required by Ohio Revised Code Chapter 4115; (iv) partial or final releases or waivers of liens arising out of the Contract from the Contractor and from each Subcontractor, material supplier, and/or laborer of the Contractor as the Owner may require; (v) schedule of all materials and equipment stored on-site; (vi) documentation required for materials and equipment stored off-site; and (vii) such other supplemental information the Owner or Owner may require. The Owner shall review each such payment request and may make such exceptions as the Owner reasonably deems necessary or appropriate under the circumstances then existing. If the Owner does not include a payment request form in the Contract Documents, then the Contractor shall use AIA Documents G-702, Application and Certificate for Payment, and G-703, Continuation Sheet

C. The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall be free and clear of liens, claims, security interests or other encumbrances adverse to the Owner's interests

19. Retainage

All payments shall be subject to the retainage requirements of Ohio Revised Code Sections 153.13, 153.14 and 153.63.

(a) Labor. Payments for labor incorporated into the Work under either a unit price or lump sum contract will be at the rate of 92 percent of the amount set forth in the Contractor's Application for Payment and approved by the Owner until the Work is 50 percent complete. When the Work is 50 percent complete, the payment for labor incorporated into the Work will be at the rate of 100 percent of the amount set forth in the Contractor's Application for Payment and approved by the Owner.

(b) Materials and Equipment. There shall be paid to the Contractor a sum at the rate of 92 percent of the invoice costs, not to exceed the scheduled value in a unit price or lump sum contract, of material delivered on the site of the Work, or suitably stored off site. The balance of the scheduled value will be payable when the materials and equipment are incorporated into the Project and accepted by Owner. The Contractor shall be paid at the rate of 100% of the scheduled value for materials incorporated into the Project. Incorporated into the Project means such materials and equipment are installed and conform to the requirements of the Project. Partial or full payment to the Contractor(s) for material, equipment, or Work in place shall not start any applicable warranty period.

(c) On Contracts totaling \$15,000 or more, unless waived by the Contractor, an escrow account shall be established in a financial institution, as escrow agent, selected by the Owner at the time Contracts are executed, and funds retained for the faithful performance of the Work shall be deposited into the escrow account when the Work is fifty percent (50%) complete as more particularly governed by Ohio Revised Code Section 153.63.

20. Substantial Completion

A. The work shall commence as set forth in the notice to proceed to Contractor, and, subject to authorized adjustments, Substantial Completion, as defined herein, shall be achieved no later than the date specified in the Contract. Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use; provided, however, that as a condition precedent to Substantial Completion, the Owner has received all certificates of occupancy and any other permits, approvals, licenses, and other documents from any governmental authority having jurisdiction thereof necessary for the beneficial occupancy of the Project.

B. When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Owner a comprehensive list of items to be completed or corrected prior to final payment (the "punch list"). Failure to include an item on such punch list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

C. Upon receipt of the Contractor's punch list, the Owner will make an inspection to determine whether the Work or designated portion thereof is substantially complete. When the Owner determines that the Work or designated portion thereof is substantially complete, the Owner will issue a Certificate of Substantial Completion which shall establish the date of Substantial Completion, establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate; if no time is fixed in the Certificate, then Contractor shall finish all items within seven (7) days following the issuance of the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Construction Manager's Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. Completion of the punch list is a function of the Contractor, and **NOT** the Owner.

D. The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof except that Owner may continue to retain an amount equal to one hundred fifty percent (150%) of the cost to hire another contractor to complete the Work until said items are finally complete. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents

21. Final Completion and Final Payment

A. Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Owner will promptly make such inspection and, when the Owner finds the Work acceptable under the Contract Documents and the Contract fully performed, the Owner will promptly issue a final Certificate for Payment subject to Contractor's compliance with Subpart B of this Article.

B. Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Owner (1) as-built drawings marked with changes made during construction, (2) AIA Document G-706, Contractors Affidavit of Payment of Debts and Claims, (3) AIA Document G-706A, Contractors Affidavit of Release of Liens, (4) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (5) a written statement that the insurance will be renewable to cover the period required by the Contract Documents, (6) an indexed, loose leaf binder containing all inspection reports, permits, and certificates of occupancy and licenses necessary for the occupancy of the project, (7) an indexed, loose leaf binder containing complete installation, operation, and maintenance manuals, including all manufacturers' literature, of equipment and materials used in the Work, (8) documentation of any warranties, such as manufacturers' warranties or specific Subcontractor warranties, (9) a complete list of Subcontractors and principal vendors on the Project, including addresses and telephone numbers, (10) data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, and (11) any other documents and items required to be submitted by Contractor in accordance with the Contract Documents.

C. The making of final payment shall constitute a waiver of claims by the Owner except those arising from:

1. liens, claims, security interests or encumbrances arising out of the Contract and unsettled;
2. failure of the Work to comply with the requirements of the Contract Documents;
3. terms of special warranties required by the Contract Documents;
4. Contractor's indemnity obligations under this Agreement; or
5. Claims against the Owner by a Subcontractor or sub-subcontractor of any tier.

D. Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

22. Liquidated Damages

If the Contractor shall fail, neglect, and/or refuse to complete any portion of the Work within the provisions of the approved construction schedule, and it is further determined that these delays directly delay Substantial Completion, Contractor shall be subject to liquidated damages (not a penalty) at the rate set forth below per calendar day for the total number of days the portion of that Work or milestone requirement is delayed beyond the completion date:

LIQUIDATED DAMAGES
Contract Amount

Dollars Per Day
\$100.00

Such liquidated damages are hereby agreed to be a reasonable pre-estimate of damages the Owner will incur as a result of delayed completion of the Work and shall be in addition to any other remedies available to Owner. The Owner may deduct liquidated damages from any unpaid amounts then or thereafter due Contractor. Any liquidated damages not so deducted shall be payable by the Contractor to the Owner upon demand. Liquidated damages are not intended to compensate the Owner for any damages the Owner incurs on account of any claims attributable to the Contractor that are brought by others, including separate contractors. In the event that the Contractor fails to pay to the Owner liquidated damages, the Owner shall deduct and retain out of the payments that may be due or become due the Contractor, the amount of such liquidated damages. The Contractor agrees to furnish written notice to the Owner of delays promptly after the Contractor becomes aware of them.

23. Ohio Department Of Transportation Construction And Material Specifications (ODOT)

The current edition of the Ohio Department of Transportation Construction and Material Specifications (ODOT), and Supplemental Specifications thereto, are included as part of the specifications for this project and shall govern the construction of any portion of this project not clearly defined herein. In the event of a conflict between the Contract and the ODOT Material Specifications, the Contract shall prevail.

24. Permits, Laws and Regulations

The Contractor shall keep itself fully informed of all existing and future ordinances or resolutions of the Owner, and of all municipal, state, and national laws in any manner affecting the work herein specified and shall at all times comply with such resolutions or ordinances and laws. The Contractor shall take out all permits legally required at its own expense, and shall pay all fees and charges incident to the prosecution and completion of the work unless otherwise noted in the technical specifications. Contractor shall notify the Chief of the appropriate Fire Department and the Owner whenever a street or section of a street is about to be closed to traffic; also when it reopened.

All pertinent MSDS sheets for materials used shall be submitted before final payment.

25. Termination by the Owner for Cause

A. The Owner may terminate the Contract if the Contractor

1. refuses or fails to supply enough properly skilled workers or proper materials;
2. fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or Suppliers;
3. disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
4. otherwise is in breach of a provision of the Contract Documents.

B. When any of the reasons described in Subpart A exist, the Owner may exercise the following non-exclusive remedies which will be cumulative and without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, and provided that the reason for the termination is not cured within the seven-day period:

1. Exclude the Contractor from the site and, for the purpose of completing the Work or portion thereof, take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

2. Accept assignment of subcontracts; and
3. Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a general accounting of the costs incurred by the Owner in finishing the Work.

C. When the Owner terminates the Contract for one of the reasons stated in Subpart A, the Contractor shall not be entitled to receive further payment until the Work is finished.

D. If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, then Contractor shall be paid for Work that it satisfactorily performed prior to the date of termination but not to exceed such excess unpaid balance. If such costs and damages exceed the unpaid balance, the Contractor and the Contractor's surety shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

E. Should the Owner terminate this Agreement for cause under this Section, but that cause be subsequently found insufficient to support termination, the termination shall be deemed one of convenience.

26. Termination by the Owner for Convenience

The Owner may, at any time, terminate the Contract in whole or in part for the Owner's convenience and without cause. The Contractor shall be entitled to receive payment for Work actually and satisfactorily executed as of the date of termination. Upon receipt of written termination notice from the Owner for convenience, the Contractor shall with respect to the Work that is terminated: (i) cease operations as directed by the Owner in the notice; (ii) take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and (iii) except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders. Contractor shall continue to proceed with any Work not terminated.

27. City Income Tax to be Withheld

Said Contractor hereby further agrees to pay all City Income Taxes due or payable under the provisions of Municipal Codes. Contractor further agrees to withhold all City Income Taxes for wages, salaries and commissions paid to its employees and further agrees that any of its subcontractors shall be required to withhold any such City Income Taxes due for work performed under this contract.

28. Warranty

The Contractor warrants to the Owner that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements shall be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work that are not in accordance with the Contract Documents and/or manufacturer's requirements, improper or

insufficient maintenance, improper operation or normal wear and tear under normal usage. The Contractor agrees to assign to the Owner at the time of final completion of the Work any and all manufacturer's warranties relating to materials and labor used in the Work and further agrees to perform the Work in such manner so as to preserve any and all such manufacturer's warranties.

29. Correction of Work

A. The Contractor shall promptly correct Work rejected by the Owner for failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Owner's services and expenses made necessary thereby, shall be at the Contractor's expense.

B. If, within one year after the date the Contractor attains substantial completion of the work, any of the Contractor's Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct it and charge the costs to the Contractor. Upon correction of any Work under or pursuant to this Article, the one (1) year correction period shall be renewed and recommence with respect to the corrected Work. The obligations under this Article shall be in addition to and not in limitation of any other warranties or guarantees required of the Contractor.

30. Taxes

The Contractor shall pay applicable sales, consumer, use and other similar taxes that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

31. Debris and Damage To Property

All Contractors shall take precautionary measures as necessary to prevent debris from littering the project premises and to prevent damage to existing structures, vegetation to be saved, or any other adjacent feature and vegetation. Any damage shall be repaired by Contractor responsible at his own expense. In no event shall construction material or debris be placed beyond the job site without consent of the Project Manager.

32. Signs and Advertising

No sign, signs or advertising of any kind will be permitted except for job site address signs as approved by Owner.

33. Temporary Facilities

Contractor shall provide and maintain such temporary facilities as deemed necessary for progress and completion of all project work, and in compliance with governing rules, regulations, code, ordinances and laws of agencies and utility companies having jurisdiction over work involved in this project. Existing facilities adjacent to the work site may be available for use upon approval of the Owner. Contractor shall be responsible for all temporary work provided, and obtain any necessary permits and inspections for such work.

34. Job Conditions

A. Contractor shall not interfere with normal use of park roads in the vicinity of project site except as absolutely necessary to execute the required work, and then only after arrangements have been made with the Owner.

B. Contractor shall not interfere with operations by Owner outside contract limit lines for this project.

35. Vehicle Access

A. Contractor shall Maintain a temporary access into the contract work area as necessary for vehicles and equipment of all trades requiring such access. Repair any damage to existing pavement, vegetation, turf, and grade when damage results from operations under this contract.

36. Temporary Barricades And Enclosures

A. Contractor shall Provide temporary provisions as required to perform work, to provide safety of workers, Owner's and Engineer's site personnel, and to the public, and to provide protection of work installed.

37. Temporary Storage

Contractor shall provide suitable storage facilities for materials at the site and protect materials from weather and damage. Any temporary storage of materials at the site shall not interfere with or damage work of any contractor, work, and property of Owner. If necessary, or as directed by the Project Manager, stored materials shall be relocated or removed.

38. Rubbish Removal

A. Contractor shall provide means of removing rubbish from all areas of the contract as work progresses, and at frequent intervals to avoid large accumulations. Contractor shall not bury rubbish on the site.

39. Insurance

A. The Contractor shall, without interruption, maintain all forms of insurance required by law as well as insurance set forth in this Section for the duration of this Agreement. The Contractor shall not cancel or allow to expire a policy of insurance without first securing a replacement policy so as to ensure the continuation of coverage:

1. Workers' Compensation Insurance and employer's liability insurance covering the statutory requirements of the State of Ohio.
2. Commercial general liability coverage for bodily injury and property damage, including limited contractual liability coverage, in not less than the following amounts: (i) General Aggregate Limit: \$2,000,000 each occurrence; (ii) Each Occurrence Limit: \$1,000,000 each occurrence.
3. Comprehensive Automobile Liability Insurance, including bodily injury, accidental death and property damage with a combined single limit of not less than One Million Dollars (\$1,000,000) each occurrence.

4. Excess and/or umbrella liability insurance in excess of the Commercial General Liability Insurance shall be obtained and maintained by the Contractor in the amount of Five Million Dollars (\$5,000,000) per occurrence and in the aggregate annually.

5. If the Work includes environmentally sensitive, hazardous types of activities (such as demolition, exterior insulation finish systems, asbestos abatement, storage-tank removal, or similar activities), or involves hazardous materials, the Contractor shall maintain a contractor's pollution liability policy with (1) a per-claim limit of not less than \$1,000,000 and (2) an annual-aggregate limit of not less than \$1,000,000, covering the acts, errors and/or omissions of the Contractor for damages (including from mold) sustained by the Owner by reason of the Contractor's performance of the Work. The policy shall have an effective date, which is on or before the date on which the Contractor first started to perform any Project-related services. Upon submission of the associated certificate of insurance and at each policy renewal, the Contractor shall advise the Owner in writing of any actual or alleged claims which may erode the policy's limits.

6. Builder's Risk Insurance.

B. The Contractor may use umbrella or excess liability insurance to achieve the required coverage for Commercial General Liability and Commercial Automobile Liability, provided that such umbrella or excess insurance results in the same type of coverage as required for the individual policies.

C. Promptly following execution of this Agreement, the Contractor shall provide the Owner with certificates of insurance evidencing the required coverages and amounts, including without limitation any certificates of renewal of insurance. Each policy of insurance required to be purchased and maintained by the Contractor shall name the Owner as a Certificate Holder, and, with the exception of worker's compensation and professional liability insurance, shall name the Owner as an additional insured.

D. When any required insurance, due to the attainment of a normal expiration date or renewal date, shall expire, the Contractor shall supply the Owner with Certificates of Insurance and amendatory riders or endorsements that clearly evidence the continuation of all coverage in the same manner, limits of protection, and scope of coverage as was provided by the previous policy. In the event any renewal or replacement policy, for whatever reason obtained or required, is written by a carrier other than that with whom the coverage was previously placed, or the subsequent policy differs in any way from the previous policy, the Contractor shall also furnish the Owner with a copy of the renewal or replacement policy unless the Owner provides the Contractor with prior written consent to submit only a Certificate of Insurance for any such policy. All renewal and replacement policies shall be in form and substance satisfactory to the Owner and written by carriers acceptable to the Owner.

E. Contractor shall immediately provide notice to Owner of the cancellation of a policy of insurance by the Contractor's insurer, and Contractor shall immediately thereafter use best efforts to procure a replacement policy so as to ensure the continuation of coverage.

All certificates must contain the provision that insurance coverages cannot be canceled unless at least a 30 day notice of such cancellation has been provided to the Owner.

40. Equal Employment Opportunity

Contractor agrees to the following:

A. That, in the hiring of employees for the performance of work under the contract or any subcontract, Contractor, by reason of race, color, religion, gender, age, disability or military status as defined in section 4112.01 of the Revised Code, national origin, ancestry, sexual orientation or gender identity shall not discriminate against any citizen of this state in the employment of a person qualified and available to perform the work to which the contract relates;

B. That Contractor or any subcontractor or person acting on behalf of Contractor or its subcontractors, in any manner, shall not discriminate against, intimidate, or retaliate against any employee hired for the performance of work under the contract on account of race, color, religion, gender, age, disability or military status as defined in section 4112.01 of the Revised Code, national origin, ancestry, sexual orientation or gender identity.

C. Any provision of a hiring hall contract or agreement which obligates the Contractor to hire, if available, only employees referred to the Contractor by a labor organization shall be void as against public policy and unenforceable with respect to employment under any public improvement contract unless at the date of execution of the hiring hall contract or agreement, or within thirty (30) days thereafter, the labor organization has procedures in effect for referring qualified employees for hire without regard to race, color, religion, gender, age, disability or military status as defined in section 4112.01 of the Revised Code, national origin, ancestry, sexual orientation or gender identity and unless the labor organization includes in its apprentice and journey person's membership, or otherwise has available for job referral without discrimination, qualified employees, both whites and non-whites (including African-Americans).

41. Claims and Disputes

A. Claims by the Contractor for additional compensation and/or an increase in the contract time arising out of or relating to this Contract, including those alleging an error or omission by the Owner, shall be submitted to the Owner within 21 days after occurrence of the event giving rise to such claim and shall be referred initially to the Owner for decision. Such matters shall, after initial decision by the Owner or 30 days after submission of the matter to the Owner, be subject to dispute resolution as set forth in subpart C. The Contractor shall set forth in detail the circumstances that form the basis for the Claim, along with such additional supporting documentation as the Owner may require. Pending final resolution of a claim, except as otherwise agreed in writing, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

B. The parties shall endeavor to resolve claims and disputes not resolved in accordance with Section 21.1 herein in an amicable manner before having recourse to a judicial forum. In addition, the Owner and Contractor may, by written agreement, submit any disputes to non-binding mediation upon such terms as shall be mutually agreeable and such mediation shall take place at an agreed-upon location in the county where the Project is located. This Section shall not prevent either party from proceeding directly to litigation or bringing a third party claim in pending litigation for indemnity and/or contribution.

C. For any claims and disputes not resolved in accordance with subpart B, litigation shall be the method of binding dispute resolution.

D. The Contract shall be governed by the laws of the State of Ohio. Any suit, which may be brought to enforce any provision of this Agreement or any remedy with respect hereto, shall be brought in the Common Pleas Court of Franklin County, Ohio except when the U.S. District Court for that County is determined to have exclusive jurisdiction.

SECTION 01 11 00

SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **General.** Provide all labor, materials, tools, and equipment necessary to construct the project in accordance with the plans and as specified herein.
- B. **The project consists of an addition** of a new maintenance storage building at the Tallgrass Park in accordance with the plans prepared by Burgess & Niple, Inc. Project includes the building complete with lighting, vapor mitigation, gravel sidewalk, and gravel drive.

1.3 QUALITY ASSURANCE

- A. **Codes and Standards.** Perform all work in compliance with all federal, state, and local codes.

1.4 SUBMITTALS

- A. **Submittal Requirements.** See other Division 1 sections for required administrative submittals and for procedures necessary for transmittal of submittals.

1.5 JOB CONDITIONS

Not used.

1.6 DELIVERY, STORAGE, AND HANDLING

Not used.

1.7 SPECIAL WARRANTY

Not used.

1.8 WORK UNDER OTHER CONTRACTS

- A. **A separate contract has been issued** for the construction of the new Nature Center at the Park.

1.9 **MISCELLANEOUS PROVISIONS**

- A. **Operational Requirements.** Instruct the Owner's operating personnel on operational requirements needed to maintain compliance.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable.

END OF SECTION

SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.
- 1.2 **DESCRIPTION OF WORK**
 - A. **Scope of Work.** Provide all labor and materials necessary to furnish the following submittals as required by each individual section of the specifications.
 1. Shop drawings.
 2. Product data.
 3. Samples/mock-ups.
 4. Operation and Maintenance (O&M) manuals.
 5. Personnel qualifications.
 6. Training documents.
 7. Source quality control documents.
 8. Material field test reports.
 9. Start-up documents.
 10. Operational demonstration documents.
 11. Product/material certifications.
 12. Special warranties.
 13. Project record documents.
 14. Others (as specified in the individual technical specifications).
- 1.3 **QUALITY ASSURANCE** (Not used)
- 1.4 **SUBMITTALS**
 - A. **General.** Submit all submittals in accordance with the requirements within this specification section.
 - B. **Submittal Package No. 1 – Submittal Schedule**
 1. Submit a submittal schedule.
 - a. This schedule shall include all submittals (including all Prime Contractors' submittals) that are required to be used on the project, and the date of submittal to the Engineer/Architect.
 - b. Include in schedule a milestone for notification of the Engineer/Architect prior to field-verifying operation and maintenance manuals.
 - c. Submittals requiring multiple submissions shall include multiple listings on the documents.

- d. The Engineer/Architect will review the list and make any necessary comments.
- e. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
- f. 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.
- g. Processing. Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals, depending upon the complexity of the submittal.
 - 1) Allow 2 weeks for processing each submittal.
 - 2) No extension of the Contract Time will be authorized because of failure to transmit submittals to the Engineer/Architect sufficiently in advance of the work to permit processing.

1.5 **JOB CONDITIONS** (Not used)

1.6 **DELIVERY, STORAGE, AND HANDLING**

- A. **Store and protect large samples and mock-ups** until the Project is completed, then properly dispose of off-site.
- B. **Maintain and make available** to the Engineer/Architect, at the job site, a complete file of all approved submittals as part of the project record documents.

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

2.1 **SUBMITTAL TRANSMITTAL**

- A. **Transmit each submittal** from the Contractor to Engineer/Architect using a transmittal form. Include the following on the transmittal form.
 - 1. Relevant information and requests for data.
 - 2. Deviations from Contract Document requirements, including minor variations and limitations.
 - 3. The specification section number.
 - 4. Other pertinent information to identify the items being submitted.

2.2 GENERAL REQUIREMENTS FOR SUBMITTALS

A. Originals

1. The Contractor, the subcontractors, or suppliers shall generate submittal information.
2. No reproductions of partial (or complete) versions of the plans, sections, details, schematics, specification pages, etc., from the Contract Documents are acceptable.

B. Complete Submittals. Clearly describe the equipment to be furnished with complete and detailed submittal information.

C. Identification. Properly identify all submittal-related documents and arrange in a logical order to best present the information. Provide an index that includes the following on every submittal.

1. Manufacturer's name and address.
2. Submittal date and revision number, if applicable.
3. Contract identification and specification section.
4. Drawing scale and orientation.
5. Submittal page number or sequence of pages.
6. Drawing number.

D. Verification

1. Where existing conditions or structures exist, field-verify dimensions, elevations, clearances, etc.
2. The submittal shall not be accepted for review until such verified data is clearly indicated.

E. Legends

1. All submittal diagrams, drawings, schematics, etc., shall include complete keys, legends or similar explanation as to the graphics, and symbols and abbreviations used.
2. In general, all graphics, symbols, abbreviations, and equipment nomenclature used for a submittal shall duplicate those used on the Contract Drawings.

F. Approvals. Provide the following on each submittal.

1. A space approximately 4" x 5" on to record the Contractor's review and approval markings and the action taken. These shall include the Contractor's:
 - a. Approval stamp.
 - b. Signature.
 - c. Date of approval.
 - d. Deviations from the Contract Documents.

2. An equal area beside the Contractor's review and approval markings for the Engineer/Architect's review stamp.
- G. **One Section per Submittal.** Each submittal shall pertain to only one specification section.
- H. **All submittal information shall be:**
1. Neatly arranged.
 2. Legible.
 3. Not distorted or faded.
 4. English.
 5. In United States standard units.
 6. Typed.
- I. **All letters, certifications, and similar documents** shall be submitted in their entirety. Single pages of multiple-page letters, or letters with deleted passages will not be acceptable for submittal purposes.
- J. **"Generic" letters, test reports,** material certifications, or similar documents which do not specifically address the requirements of the Contract Documents for the actual materials being furnished will not be acceptable.
- K. **Mark all submittals** to clearly indicate the full extent of the equipment to be furnished.
1. Indicate all options to be provided, materials of construction, dimensions, and other information pertinent to the submittal.
 2. Options, materials, and dimensions which do not pertain to the materials or equipment to be furnished shall be neatly marked out so as to avoid confusion and doubt during review, delivery, and installation.
- L. **Resubmittals must clearly identify** all changes and revisions.
1. The drawing shall be marked "revised" with the revision date indicated.
 2. Each resubmittal shall reference the previous submittal by the Engineer/Architect's log number.
- M. **"By Others"**
1. All submittals are reviewed as if prepared by the Prime Contractor.
 2. The term "By Others" is appropriate to indicate supply by the Owner or another Prime Contractor.
 3. Where a subcontractor or supplier uses the term "By Others" to indicate work by the Prime Contractor or another subcontractor or supplier, the Prime Contractor shall change "By Others" to indicate the actual source.
- N. **Deviations from Contract.** Highlight, encircle, or otherwise indicate deviations from the Contract Documents in all submittals.

2.3 SPECIFIC SUBMITTAL-TYPE REQUIREMENTS

- A. **Shop Drawings.** The following paragraphs detail the general requirements for shop drawings and specific requirements for specific types of shop drawings.
1. General Requirements.
 - a. A shop drawing is a detailed representation of the work to be performed to demonstrate compliance with the Contract Drawings including:
 - 1) Material and equipment layout.
 - 2) Fabrication drawings.
 - 3) System and electrical schematic diagrams.
 - 4) Equipment and material schedules.
 - 5) Installation details.
 - b. Submit newly prepared information, drawn to accurate scale.
 - c. Standard information prepared without specific reference to the project is not considered shop drawings.
 2. Equipment/Material Layout Drawings.
 - a. Include:
 - 1) Plot plans.
 - 2) Plant site maps.
 - 3) Equipment location plans.
 - 4) Equipment and material layout plans and sectional views.
 - 5) Connection detail drawings.
 - 6) Similar drawings showing the incorporation of materials and equipment into the work.
 - 7) The physical layout to scale, including elevations, plant grid coordinates, dimensions to new/existing structures, and other items of the work.
 - 8) Dimensions.
 - 9) Labeling.
 - 10) Notes.
 - 11) Legends.
 - 12) Bills of materials.
 - 13) All other information required to graphically describe the proposed work.
 3. System Schematics and Diagrams.
 - a. These include schematic representations of systems and equipment in a manner which shows the relative relationship of the components within the system and interconnections or interfaces with other systems or equipment.

- b. These systems shall be shown on the most appropriate type and format of schematic diagram.
- c. Diagrams shall identify all equipment and other components.
- d. Indications shall be provided of system features such as flow directions, flow ranges, component sizes, capacities, settings, interlocks, component identification, and component or subsystem function.
- e. Various types of systems for which schematic diagrams shall be required include:
 - 1) Plumbing and Utility Piping Systems.
 - 2) Heating and Air Conditioning Systems.
 - 3) Ventilating Systems.
 - 4) Electrical Distribution Systems.
 - 5) Control Systems.
 - 6) Alarm Systems.
 - 7) Communication Systems.
- f. In some instances it may be appropriate to combine multiple types of system schematics onto a single drawing. In general, this practice would be appropriate for simple, self-contained systems and the adjacent subsystems and when required to clearly show system functionality.

B. Product Data. Product data is submittal information that fully describes the item to be incorporated into the work. Product data shall include when applicable:

- 1. Manufacturer name.
- 2. Catalog cut-sheets.
- 3. General descriptive bulletins/brochures/specifications.
- 4. Materials of construction data and parts list.
- 5. Finish/treatment data.
- 6. Equipment/material weight/loading data.
- 7. Power/utility requirements.
- 8. Engineering design data, calculations, and system analyses.
- 9. Digital system documentation.
- 10. Any deviations from the contract documents.
- 11. Material Certifications. These include signed certificates or declarations by the Contractor, supplier, manufacturer, testing laboratory, or recognized certification agency which document that materials and product composition or construction comply with specified requirements and stated reference standards.
- 12. Manufacturer's printed recommendations.
- 13. Compliance with recognized trade association and testing agency standards.

14. Application of testing agency labels and seals.
15. Notation of dimensions verified by field measurement.
16. Notation of coordination requirements.
17. Specific response to detailed specification requirements.
18. Maximum operating pressure and temperature ratings.
19. Other information specifically called for under the sections of Divisions 1 through 44 shall be included in this category.

C. Samples or Mock-Ups

1. Samples. Samples are portions of or complete units of the precise article proposed to be furnished.
2. Color and Pattern Charts. When the precise color and pattern are not specifically prescribed in the Contract Documents, or when the Contract Documents require that a product be furnished in a color or pattern directed by the Owner or Owner's Representative, submit accurate color charts and pattern charts of the available ranges for review and selection.
3. Mock-Ups. Build mock-ups with full-size products to match the scale of the proposed construction to demonstrate compliance with specified requirements and construction standards.

D. O&M Manuals

1. General.
 - a. Bind each copy in an appropriately sized three-ring notebook a cover designating the name of equipment, maintenance, and specification section number.
 - b. Bind operation and maintenance instructions for each specification section in a separate notebook.
2. Required Information. Include the following information to provide a description of the incorporation of the equipment into the work and with functional data to evaluate equipment operation.
 - a. Operation Sequence Descriptions. These shall:
 - 1) Include complete, detailed written descriptions of the operating sequence of all control systems and operations in all modes.
 - 2) Be specifically prepared for this work.
 - 3) Be fully referenced to control diagrams and system components.
 - 4) Include start-up and shut-down procedures and operations under manual, automatic, and emergency (alarm) conditions and any alternate operating modes.
 - 5) Include operation of switches, lights, timers, relays, contacts, valves, motors, and equipment components.
 - 6) Describe interlock functions including system safety functions.

- b. Manufacturer's Instructions. Include:
 - 1) Installation, routine preventive maintenance, troubleshooting, and lubrication instructions.
 - 2) Procedures for moving, supporting, and anchoring of equipment, including tolerances for settings and adjustment.
 - 3) Storage requirements to protect products prior to installation and during periods of prolonged shutdown.
 - 4) Storage requirements of extra materials.
- c. Parts List. Include assembly, exploded-view illustrations, or sectional drawings with all parts identified. Also include descriptions, quantity (per assembly) required, and original equipment manufacturer's part numbers.
- d. Supplier Data. Provide addresses, telephone numbers, and names of contact persons for equipment manufacturer and manufacturer's representative. Include both regional (local) and home offices.
- e. Warranties and Guarantees. Include copies of the approved draft warranties in the initial operation and maintenance manual submittal. Following substantial completion, provide copies of the executed final warranties for insertion into the final operation and maintenance manuals.
- f. Approved Submittals. Provide a complete list (including submittal numbers) of all approved submittals pertaining to the operation and maintenance instructions.
- g. Copies of all materials shipped with the equipment.
- h. Copies of all approved submittals including control wiring diagrams.

E. Material Field Test Reports

- 1. Report Data. Written reports of each inspection, test, or similar service shall include, but not be limited to:
 - a. Date of issue.
 - b. Project title and number.
 - c. Name, address, and telephone number of testing agency.
 - d. Dates and locations of samples and tests or inspections.
 - e. Names of individuals making the inspection or test.
 - f. Designation of the work and test method.
 - g. Identification of product and specification section.
 - h. Complete inspection or test data.
 - i. Test results and interpretations of test results.

- j. Ambient conditions at the time of sample taking and testing.
 - k. Comments or professional opinion as to whether inspected or tested work complies with Contract Document requirements.
 - l. Name and signature of laboratory inspector.
 - m. Recommendations on testing.
2. Example reports covered by this paragraph include compaction tests and concrete, leakage, and disinfection tests.

F. Special Warranties

- 1. There are two general types of warranties covered by this specification.
 - a. Manufacturer's Express Warranties.
 - 1) These are formal statements of certifications by manufacturers which warrant to the Owner that products and equipment are free from defects in material and workmanship.
 - 2) These are standard warranties issued with products and equipment which supplement the Contractor's warranty and may also extend coverage past the expiration of the Contractor's warranty.
 - 3) Include with the manufacturer's warranty data shall be a notification of the availability of an extension to the standard warranty including terms.
 - b. Special Express Warranties.
 - 1) The form, format, and conditions of special warranties are described in the various specification sections of the Contract Documents.
 - 2) These are formal warranties above and beyond the Contractor's warranty and manufacturer's standard warranties.
 - 3) These warranties may be based on performance, power consumption, maintenance projects, or other operating parameters.
 - 4) Extended warranties, service contracts, and performance bonds are also included under this category.
- 2. Term or Period. Unless otherwise established by individual sections in Divisions 2 through 44, all Contractor express warranties shall extend for 1 calendar year from the date of substantial completion of the project or acceptance date of the product or portion of work thereof, whichever is the later date.
- 3. Content of Warranty. The warranty shall contain, as applicable:
 - a. Effective starting date of the warranty period.
 - b. Statement of the terms and conditions of the warranty, if any.

G. Project Record Documents

1. Project record documents are to be maintained by Contractor.
2. Record Contract Drawings. Legibly mark contract drawings to record actual construction including:
 - a. Depths of various elements of foundation in relation to data.
 - b. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
 - c. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
 - d. Field changes of dimension and detail.
 - e. Changes made by change order or field order.

H. Extra Materials/Spare Parts

1. Coat or package extra materials to prevent corrosion or deterioration during long-term indoor storage.
2. Clearly label all packaging with:
 - a. Part name.
 - b. Part number.
 - c. Associated equipment name and number.
 - d. Manufacturer's name and address.
 - e. The required storage environment for the materials.

- I. **Other.** These include special tools/repair parts list, photographs, videos, certificates, construction schedules, drawings, reports, meeting minutes, data, and information required by the Contract Documents which do not logically fall into the submittal types defined above.

PART 3 - EXECUTION

3.1 SUBMITTAL PREPARATION AND TRANSMITTAL

A. Coordination

1. Coordinate preparation and processing of submittals with performance of construction activities.
2. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay and in accordance with the submittal schedule.
3. The General Contractor is responsible for resolving any disputes between Prime Contractors over submittals.

B. Verification

1. Verify the correctness and completeness of all submittals prior to forwarding same for review.
2. All submittals shall comply with the Contract Documents.

C. Package each submittal appropriately for transmittal and handling including a transmittal form.

D. The Prime General Contractor shall submit the minimum number of submittals as listed in paragraph 3.3 of this specification.

E. Submittals received from sources other than the Prime General Contractor will be returned without action.

F. Other Prime Contractors shall submit all submittals through the Prime General Contractor.

3.2 ENGINEER/ARCHITECT'S REVIEW AND ACTION

A. General

1. Except for submittals for record, information, or similar purposes where action and return is not required or requested, the Engineer/Architect will review each submittal, mark to indicate action taken, and return promptly.
2. Cost to review any submittal more than twice will be deducted from Contractor's monthly estimates and final payments.
3. The Engineer/Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. Action Stamp. The Engineer/Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate action taken.

1. Final Unrestricted Release. Where submittals are marked "Approved," that part of the work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
2. Final-but-Restricted Release. When submittals are marked "Approved as Noted," that part of the work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
3. Returned for Resubmittal.
 - a. When submittal is marked "Not Approved" and/or "Revise and Resubmit," do not proceed with that part of the work covered by

- the submittal, including purchasing, fabrication, delivery, or other activity.
- b. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
- c. Do not permit submittals marked "Not Approved" and/or "Revise and Resubmit" to be used at the project site or elsewhere where work is in progress.

3.3 MINIMUM NUMBER OF SUBMITTALS AND DISTRIBUTION

- A. **The Contractor shall submit submittals electronically** and email them to the Engineer/Architect or post them to an agreed upon file share system for review and comment. After a submittal has been approved, the Engineer/Architect will return the submittal to the Contractor electronically.

3.4 SPECIFIC SUBMITTAL-TYPE EXECUTION REQUIREMENTS

A. **O&M Manuals**

1. Submittal Procedure. Submit one initial copy of the O&M manual for review. After approval of the initial copy, submit the remainder of the revised manuals.
2. Verification. Verify the accuracy of the initial O&M manual by visual and physical inspection of the installed equipment during start-up.
 - a. Perform field verification in the presence of the Owner or Owner's Representative.
 - b. Physically trace and document as required all wiring and piping.
 - c. Visually inspect equipment and components and compare configurations and nameplate information to O&M manual.
 - d. Make any changes, additions, or deletions to the O&M manual identified during field verification.
 - e. In the event changes are made to the equipment following field verification, submit a final supplement of the revisions of the O&M manuals before approval.

B. **Sample Panels**

1. Construct any required sample panels on-site.
2. Construct sample panels only after the individual samples and components used in the sample panel have been approved.
3. If a sample panel does not conform to the Contract requirements, construct additional ones until conformance is achieved.

- C. **Samples for Tests.** Furnish samples of material as may be required for examination and test. Take all samples of materials for tests according to standard methods or as provided in the Contract Documents.

END OF SECTION

SECTION 01 50 00

TEMPORARY CONSTRUCTION SERVICES AND FACILITIES

PART 1 - GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of each Prime Contract, including General and Supplementary Conditions and other Division 1 specification sections, apply to this section.

1.2 **DESCRIPTION OF WORK**

- A. **General.** Provide the labor, tools, equipment, and material necessary to furnish, install, and maintain the temporary construction services and facilities in accordance with these plans and specifications. Temporary construction services and facilities include the following.

1. Temporary utilities required include, but are not limited to:
 - a. Water service and distribution.
 - b. Temporary electric power and light.
 - c. Telephone service.
 - d. Storm and sanitary sewer.
2. Temporary construction and support facilities required include, but are not limited to:
 - a. Hoists and temporary elevator use.
 - b. Temporary heat.
 - c. Field offices and storage sheds.
 - d. Temporary roads and paving.
 - e. Sanitary facilities, including drinking water.
 - f. Temporary enclosures.
 - g. Temporary project identification signs and bulletin boards.
 - h. Waste disposal services.
 - i. Construction aids and miscellaneous services and facilities.
 - j. Dewatering facilities and drains.
 - k. Rodent and pest control.
3. Security and protection facilities required include, but are not limited to:
 - a. Temporary fire protection.
 - b. Barricades, warning signs, lights.
 - c. Sidewalk bridge or enclosure fence for the site.
 - d. Environmental protection.

1.3 **QUALITY ASSURANCE**

- A. **Regulations.** Comply with industry standards and with applicable laws and regulations of authorities having jurisdiction, including but not limited to:

1. Building code requirements.
2. Health and safety regulations.
3. Utility company regulations.
4. Police, fire department, and rescue squad rules.
5. Environmental protection regulations.

B. **Standards.** Comply with National Fire Protection Association (NFPA) Code 241, "Building Construction and Demolition Operations"; American National Standards Institute (ANSI) A10 Series standards for "Safety Requirements for Construction and Demolition"; and National Electrical Contractors Association (NECA) Electrical Design Library "Temporary Electrical Facilities."

1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services" prepared jointly by Associate General Contractors of America (AGC) and Adhesive and Sealant Council, Inc. (ASC) for industry recommendations.
2. Electrical Service. Comply with National Electrical Manufacturers Association (NEMA), National Electrical Contractors Association (NECA), and Underwriters' Laboratories, Inc. (UL) standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NEC) (NFPA 70).

C. **Inspections.** Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits and keep on file for Owner review.

1.4 **SUBMITTALS** (Not used)

1.5 **JOB CONDITIONS**

A. **Conditions of Use**

1. Keep temporary services and facilities clean and neat in appearance.
2. Operate in a safe and efficient manner.
3. Take necessary fire-prevention measures.
4. Do not overload facilities.
5. Do not allow hazardous, nuisance, or unsanitary conditions to develop or persist on the site.
6. Do not permit facilities to interfere with progress.
7. The installer of each permanent service or facility shall assume responsibility for its operation, maintenance, and protection during its use as a construction service or facility prior to the Owner's acceptance, regardless of previously assigned responsibilities.
8. At the earliest feasible time, when acceptable to Owner, change over from use of the temporary service to use of the permanent service.

1.6 **DELIVERY, STORAGE, AND HANDLING** (Not used)

1.7 **SPECIAL WARRANTY** (Not used)

1.8 USE CHARGES

- A. **General.** Cost or use charges for temporary facilities are not chargeable to the Owner or Engineer/Architect; Prime Contractor's cost or use charges for temporary services or facilities will not be accepted as a basis of claim for an adjustment in the Contract Sum or Contract Time.
- B. **Water Service.** Water from the Owner's existing water system, if available, shall be used without metering and without payment of use charges.
- C. **Electric Power Service.** The Electrical Contractor shall pay electric power service use charges, whether metered or otherwise, for electricity used by all entities engaged in construction activities at the project site.
- D. **The costs of providing and using temporary services** and facilities, including use charges, are divided between all of the Prime Contractors and shall be totally included in the Contract Sums.
- E. **Other entities using temporary services** and facilities include, but are not limited to:
 - 1. Other nonprime Contractors.
 - 2. The Owner's work forces.
 - 3. Occupants of the project.
 - 4. The Engineer/Architect.
 - 5. Testing agencies.
 - 6. Personnel of government agencies.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. **General.** Provide new or acceptable previously used materials. Provide materials suitable for the use intended.
- B. **Open Mesh Fencing.** Provide 11-gauge, galvanized 2-inch, chain-link fabric fencing 6 feet high with galvanized barbed wire top strand and galvanized steel pipe posts, 1-1/2-inch inside diameter (I.D.) for line posts, and 2-1/2-inch I.D. for corner posts.

2.2 EQUIPMENT

- A. **General.** Provide new or acceptable previously used equipment. Provide equipment suitable for the use intended.
- B. **Fire Extinguishers**
 - 1. Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces.

2. In other locations provide hand-carried, portable, class "ABC" dry-chemical extinguishers, or a combination of extinguishers of NFPA recommended types for the exposures.
3. Comply with NFPA 10 and 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. **Use qualified personnel** for installation of temporary facilities.
- B. **Location.** Coordinate location with Owner and Engineer/Architect. Locate facilities where they serve the project adequately and result in minimum interference with performance of construction activities. Relocate facilities as required.
- C. **Provide each facility ready for use** when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. **General.** Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.
 1. Arrange with the company and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services.
 2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
 3. Obtain easements to bring temporary utilities to the site, where the Owner's easements cannot be used for that purpose.
- B. **Water Service.** Install water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use. Disinfect temporary water piping prior to use.
- C. **Temporary Electric Power Service**
 1. Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction.
 2. Include meters, transformers, overload protected disconnects, automatic ground fault interrupters, and main distribution switch gear.
 3. Power Distribution System. Install wiring overhead, and raise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125-Vac 20-ampere rating and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.

D. **Temporary Lighting**

1. Whenever an overhead floor or roof deck has been installed, install temporary lighting with local switching.
2. Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire lighting system, and will provide adequate illumination for construction operations and traffic conditions.

E. **Provide earthen embankments and similar barriers** in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

3.3 **TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES
INSTALLATION**

A. **Temporary Heat**

1. Provide temporary heat required by construction activities, for curing or drying of completed installations, or protection of installed construction from adverse effects of low temperatures or high humidity.
2. Select safe equipment that will not have a harmful effect on completed installations or elements being installed.
3. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.
4. Provide properly vented self-contained LP gas or fuel oil heaters with individual space thermostatic control.
5. Do not use gasoline-burning space heaters, or open-burning or salamander-type heating units.

B. **Field Offices**

1. Provide an insulated, weathertight, heated, or air-conditioned temporary office of sufficient size to accommodate required office personnel at the project site if required by the Contractor.
2. Keep the office clean and orderly.

C. **Storage and Fabrication Sheds.** Install storage and fabrication sheds, sized, furnished, and equipped to accommodate materials and equipment including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on the site.

D. **Sanitary facilities include** temporary toilets, wash facilities, and drinking water fixtures.

1. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities.
2. Install where facilities will best serve the project's needs.
3. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used material.

4. Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
5. Provide bottled-water-type drinking water units.
6. Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

E. **Temporary Enclosures.** Provide temporary enclosure for protection of construction in progress and completed, from exposure, foul weather, other construction operations, and similar activities.

1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
2. Install tarpaulins securely, with fire-treated wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.
3. Close openings through floor or roof decks and horizontal surfaces with load bearing wood framed construction.

F. **Temporary Site Lighting.** Install exterior yard and sign lights so that signs are visible when work is being performed.

G. **Collection and Disposal of Waste.** See Section 01 74 23, "Cleaning."

H. **Stairs**

1. Until permanent stairs are available, provide temporary stairs where ladders are not adequate.
2. Cover finished permanent stairs with a protective covering of plywood or similar material so finishes will be undamaged at the time of acceptance.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. **General.** Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested.

B. **Temporary Fire Protection**

1. Maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses.
2. Comply with NFPA 10, "Standard for Portable Fire Extinguishers," and NFPA 241, "Standard for Safeguarding Construction, Alterations and Demolition Operations."

3. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
4. Store combustible materials in containers in fire safe locations.
5. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and other access routes for fighting fires.
6. Prohibit smoking in hazardous fire exposure areas.
7. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.

C. Barricades, Warning Signs, and Lights

1. Comply with standards and code requirements for erection of structurally adequate barricades.
2. Paint with appropriate colors, graphics, and warning signs to warn personnel and the public of the hazard.
3. Where needed, provide lighting including flashing lights.

D. Enclosure Fence

1. When excavation begins, install an enclosure fence with lockable entrance gates.
2. Locate where indicated, or enclose the portion determined sufficient to accommodate construction operations.
3. Install in a manner that will prevent people and animals from easily entering the site, except by the entrance gates.
4. Provide open-mesh, chain-link fencing with posts set in a compacted mixture of gravel and earth.

E. Security Enclosure and Lockup

1. Install substantial temporary enclosure of partially completed areas of construction.
2. Provide locking entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
3. Storage of Valuable Material. Where materials and equipment must be stored and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

F. Environmental Protection

1. Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted, or that other undesirable effects might result.
2. Avoid use of tools and equipment which produce harmful noise.
3. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.5 OPERATION, TERMINATION AND REMOVAL

- A. **Supervision.** Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. **Maintenance**
 - 1. Maintain facilities in good operating condition until removal.
 - 2. Protect from damage by freezing temperatures and similar elements.
 - 3. Maintain operation of temporary construction services and facilities on a 24-hour-day basis where required to achieve indicated results and to avoid possibility of damage.
 - 4. Prevent water filled piping from freezing. Maintain markers for underground lines.
 - 5. Protect from damage during excavation operations.
- C. **Termination and Removal**
 - 1. Unless requested that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion.
 - 2. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility.
 - 3. Repair damaged work, clean exposed surfaces, and replace work which cannot be satisfactorily repaired.
 - 4. Materials and facilities that constitute temporary facilities are property of each Prime Contractor. The Owner reserves the right to take possession of project identification signs.
 - 5. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:
 - a. Replace air filters and clean inside of ductwork and housings.
 - b. Replace significantly worn parts and parts that have been subject to unusual operating conditions.
 - c. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

END OF SECTION

SECTION 01 57 13

SEDIMENT AND EROSION CONTROL (Ohio version)

PART 1 - GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to work in this section.
- 1.2 **DESCRIPTION OF WORK**
- A. **Scope of Work.** Provide all labor, tools, equipment, and materials necessary to furnish and maintain the soil erosion controls where shown, where shown on the Contractor's Storm Water Pollution Prevention Plan (SWP3), where directed, and as specified herein.
- B. **SWP3 Preparation.** Prepare an SWP3 for this project, obtain necessary permits, provide dust control, and terminate coverage under the permits, if necessary, upon completion of the work.
- 1.3 **QUALITY ASSURANCE**
- A. **Codes and Standards.** Perform all work required in the control of erosion during construction in compliance with the following standards as referenced herein:
1. ODOT – Ohio Department of Transportation. Construction and Material Specifications (most recent edition).
 2. ODNR – Ohio Department of Natural Resources. "Rainwater and Land Development Ohio's Standards for Stormwater Management Land Development and Urban Stream Protection" (Rainwater and Land Development) current edition.
- B. **Conflicts.** In the event of a conflict between these requirements and pollution control laws, rules, or regulations of other federal, state, or local agencies, the more restrictive laws, rules, regulations, or standards shall apply.
- 1.4 **SUBMITTALS**
- A. **General.** Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.
- B. **Submittal Package No. 1 – SWP3 and Notice of Intent (NOI) Form (as needed)**
1. Submit the Contractor's SWP3 including associated drawings and details of sediment and erosion control measures that will be employed during the project.

1.5 **JOB CONDITIONS**

A. **Construction Sites Less than 1 Acre**

1. SWP3. Develop and implement an SWP3 for the control of sediment and erosion at this project site throughout construction. At a minimum, the SWP3 shall include the following:
 - a. Site drawing showing the limits of all earth-disturbing activities, location of proposed temporary access roads or stockpiles, and location of all proposed sediment and erosion control features (i.e., silt fencing, sediment basins, temporary seeding, etc.). Include details for installation and material specifications for each erosion control feature.
 - b. Written description of the proposed sediment and erosion control measures that will be employed, including a schedule for installation and removal of temporary controls as they are related to actual site construction. Also include information regarding site soils, any permanent or temporary seeding, an inspection and maintenance schedule, and all measures that will be employed by any subcontractors.

- B. **Sediment and Erosion Control Shown on the Plans.** The sediment and erosion control measures shown on the plans, if any, are considered to be the minimum level of control required. Prepare the final SWP3 and use, if appropriate, alternate methods and locations of sediment and erosion control to meet the site requirements provided they are approved.

1.6 **DELIVERY, STORAGE, AND HANDLING**

- A. **General.** Handle all sediment and erosion control materials in accordance with the manufacturer's recommendations.
- B. **Storage.** Store all seeds for temporary seeding in a safe, dry location protected from weather conditions that may affect the seed viability.

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

- 2.1 **GENERAL.** The SWP3 shall incorporate some or all of the following equipment and materials for sediment and erosion control measures, as appropriate. Alternative materials and methods as presented in ODOT Item 832 or ODNR's Rainwater and Land Development manual may be considered.
 - A. **Sediment Barriers.** Sediment barriers are temporary measures using woven wire or other approved material attached to posts with filter cloth of burlap and plastic filter fabric to intercept, detain, and control sediment and erosion from leaving the construction site.

1. Filter Fabric/Silt Fence. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester, or ethylene yarn. Fabric shall be ODOT Item 712.09, Type C or equal.
 2. Wire Fencing. Wire fence reinforcement for silt fences at storm drain inlets shall be a minimum of 42 inches in height and a minimum of 14 gauge, and shall have a maximum mesh spacing of 6 inches.
 3. Silt Fence Posts. Posts for silt fences shall be either 2-inch-by-2-inch hardwood or equivalent steel with a minimum length of 32 inches. Steel posts shall have projections for fastening wire to them.
 4. Storm Drain Inlet Protection Framing. Stakes and framing for yard, drainage ditch, or parking lot inlet protection shall be 2-inch-by-4-inch wood (preferred) or equivalent metal with a minimum length of 3 feet for the stakes/posts.
- B. **Matting.** Matting shall be agricultural straw or coconut fiber within photodegradable netting, jute, excelsior, or approved equal synthetic material as specified in ODOT Items 671 and 712.11.
- C. **Temporary Seeding and Mulching.** Temporary seeding and mulching are measures consisting of seeding, mulching, fertilizing, and matting used to reduce erosion. All cut-and-fill slopes including borrow pits shall be seeded and/or mulched where and when necessary to eliminate erosion.
1. Materials. Mulch.
 - a. Straw. Straw mulch shall be unrotted small-grain straw, free of sticks or other foreign material.
 - b. Wood Cellulose Fiber. Wood cellulose fiber mulch shall be dyed green and not inhibit seed germination.
 2. Fertilizer. Fertilizer shall contain 12 percent total nitrogen, 12 percent available phosphoric acid, and 12 percent water-soluble potash. The name of plant nutrients, weight, and quarantined percentages shall be marked on the sealed containers.
- D. **Sediment Structures.** Sediment basins, dams, and dikes are prepared storage areas to trap and store sediment from construction areas and to protect properties and stream channels below the construction areas from siltation.
- E. **Rock Channel Protection.** Aggregate for the rock channel protection, dams, erosion control, or other uses indicated on the drawings, shall be provided in accordance with ODOT Item 601. Gradation/type shall be as noted on the drawings.

PART 3 - EXECUTION

3.1 GENERAL

- A. **Examination.** Inspect the existing and proposed site drainage patterns in order that the most efficient methods of erosion control may be selected through the duration of construction.

- B. **Fill material and equipment storage** is prohibited within 200 feet of the stream bank, in the floodplain, in wooded areas, or in other environmentally sensitive areas. Dispose of surplus excavated materials off-site.
- C. **Maintenance.** Be responsible for ongoing inspection and maintenance of the sediment and control features. At a minimum, complete an inspection log at least every 7 calendar days and within 7 days of each rainfall event. Repair/replace damaged features.
- D. **Dust Control.** Minimize dust generation, including wetting down unpaved areas during the construction activities.

3.2 PREPARATION

A. General

1. Limit the surface area of erodible earth material exposed by the clearing and grubbing, excavation, borrow, and fill operations and provide immediate permanent or temporary control measures to prevent contamination of adjacent streams or other water courses, lakes, ponds, or other areas of water impoundment.
2. Such work will involve the construction of temporary ditch checks, filters, benches, dikes, dams, sediment basins, and slope drains, and use of temporary mulches, mats, seeding, or other control devices or methods necessary to control erosion and sedimentation.
3. Prepare and submit an SWP3 in advance of the work.
4. Limit the area of excavation, borrow, and embankment operations in progress commensurate with capability.
5. Deliver sediment and erosion control materials at appropriate times so that the project is not delayed.
6. Do not commence with any earth-disturbing activity until the appropriate sediment and erosion control features are in place.

- B. **Sediment and Erosion Control Devices.** Minimization of denuded areas and the length of time that any area is denuded is the primary method of sediment and erosion control at any site. Adequate scheduling and the use of permanent and temporary seeding or mulching as described in paragraph 3.3 can accomplish this.

Areas that are to be denuded shall have structural control measures in place prior to exposure of the soil and such measures shall remain until the area is established and permanent measures are in place. In the case of silt fencing, which may require the rough grading to be completed prior to installation, it shall be installed as soon as practical. Structural measures shall include at a minimum:

1. Sediment basins for all drainage areas greater than 5 acres.
2. Aggregate construction entrances at all points of construction traffic egress from the site onto pavement.
3. Silt fencing at all areas of sheet flow.
4. Inlet protection at all storm water inlets.
5. Matting at all slopes greater than 3:1 and drainage swales/ditches.

6. Sediment traps or basins at all drainage areas that can not be adequately protected with silt fencing as determined by the Contractor developing the SWP3.
7. Silt fencing around soil stockpiles or cover them with tarps.

3.3 EROSION CONTROL

A. Permanent Erosion Control

1. Incorporate all permanent erosion control features into the project at the earliest practicable time.
2. Perform the permanent seeding and mulching and other specified slope protection work in stages, as soon as substantial areas of exposed slopes can be made available.
3. Establish final grades and application of fertilizer, seed, and mulch.
4. Maintain sediment barriers until grass has grown.

B. Temporary Erosion Control

1. Provide temporary seeding and mulching as delineated in the SWP3, as directed, as specified in the general NPDES permit, and for all denuded areas that are to remain dormant for more than 14 days.
2. Apply temporary erosion control within 7 days after final or temporary grade has been reached that will remain dormant for more than 14 days.
3. For areas within 50 feet of a stream, apply temporary erosion control within 2 days after the most recent disturbance of an area that will remain dormant for more than 14 days.
4. Install temporary erosion control measures including seeding and mulching immediately if seasonal limitations make permanent control measures unrealistic.

Temporary seed shall be of the type specified in ODNR's Rainwater and Land Development manual for the time of year that it is applied. Temporary seeding shall also include application of 12-12-12 fertilizer at the rate of 6 pounds per 1,000 square feet and mulching in accordance with ODNR's Rainwater and Land Development manual.

3.4 SEDIMENT BARRIERS

- A. **Filter Barriers (FB).** Construct the FBs using synthetic filter fabric. They are designed for sediment removal and erosion control of low or moderate channelized flows not exceeding 1 cubic foot per second (cfs).

1. The height of an FB shall be between 15 inches and 18 inches.
2. Purchase filter fabric in a continuous roll and avoid the use of joints by cutting to the length of the barrier.
3. Space the stakes a maximum of 3 feet apart at the barrier location and drive them securely into the ground (minimum of 8 inches).
4. Excavate a trench approximately 4 inches wide and 4 inches deep along the line of stakes and upslope from the barrier.

5. Staple the filter material to the wooden stakes, and extend 8 inches of the fabric into the trench. Use heavy-duty wire staples at least 1/2 inch long. Do not staple filter material to trees.
6. Backfill the trench and compact the soil over the filter material.
7. Install straw bales on the downstream side of all filter barriers. Install bales in a single row and securely anchor them with a minimum of two stakes per bale.
8. If an FB is to be constructed across a ditch line or swale, the barrier shall be of sufficient length to eliminate end flow, and the plan configuration shall resemble an arc or horseshoe with the ends oriented upslope.
9. Remove FB when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

- B. **Silt Fence (SF).** SF is designed for situations in which only sheet or overland flows are expected, and the following drainage area limits are applied.

Silt Fence Maximum Drainage Area (Based on Slope of Drainage Area)	
Slope	Maximum Drainage Area (Acres) to 100 Linear Feet of Silt Fence
0-2% (<50:1)	0.5
2%-20%	0.25
>20%	0.125

SF details are included on the plans or within ODNR's Rainwater and Land Development manual.

1. Locate the silt fence at the flattest area available and follow a level contour of the land so that flows are dissipated into uniform sheet flow.
2. The height of an SF shall not exceed 36 inches (higher fences may impound volumes of water sufficient to cause failure of the structure).
3. Purchase the filter fabric in a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are necessary, splice filter cloth together only at a support post, with a minimum 6-inch overlap, and securely seal.
4. Drive posts securely into the ground (minimum of 12 inches).
5. Excavate a trench approximately 4 inches wide and 6 inches deep along the line of posts and upslope from the barrier.
6. Staple or wire the filter fabric to the fence, and extend 8 inches of the fabric into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Do not staple filter fabric to trees.
7. Backfill the trench and compact the soil over the filter fabric.
8. Remove SF when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

C. **Maintenance**

1. Inspect SF and FB a minimum of every 7 days and immediately after each rainfall or at least daily during prolonged rainfall. Make any required repairs immediately.
2. Should the fabric on an SF or FB decompose or become ineffective prior to the end of the expected useable life and the barrier is still necessary, replace the fabric promptly.
3. Remove sediment deposits after each storm event. They must be removed when deposits reach approximately one-half the height of the barrier.
4. Dress any sediment deposits remaining in place after the SF or FB is no longer required to conform with the existing grade, and prepare and seed them.

3.5 **MATTING**

A. **General.** Matting details are included in ODNr's Rainwater and Land Development manual. Provide matting:

1. On all final slopes 3:1 or greater.
2. Along the bottom of all drainage ditches until permanent seeding has grown and is established.
3. In areas where establishing vegetation is difficult.
4. Where mulch is difficult to hold in place due to wind or water.
5. Where water velocities exceed 3.5 feet per second.

B. **Securing.** Secure matting in accordance with the manufacturer's instructions or with No. 11 gauge, or heavier, sod staples that are a minimum of 6 inches in length.

C. **Erosion Stops**

1. Erosion stops are narrow trenches (6 to 12 inches deep) across the full channel section to prevent undermining and gullies from forming below the matting.
2. Provide them at a maximum spacing of 50 feet apart (more frequently if recommended by the matting supplier) in areas of high erosion potential and at the leading edge of a matting roll.
3. High erosion potential is in rocky areas that prevent soil-to-matting contact, erosive soils, and steep slopes.
4. Place the leading edge or piece of matting (for intermediate stops) within the narrow trench and secure it in place before backfilling the trench.

3.6 **STORM DRAIN INLET PROTECTION (IP)**

A. **General**

1. Provide temporary sediment control around all storm inlets until the tributary drainage area is permanently stabilized.
2. This shall consist of an inlet sediment filter of silt fencing as specified and detailed herein.

3. Utilize storm drain IP at all storm drain inlets in addition to matting and sediment barriers previously discussed.

B. Yard, Drainage Ditch, or Parking Lot Inlet Protection. Details are included in ODNR's Rainwater and Land Development manual.

1. Filter Fabric.
 - a. Excavate earth to a minimum depth of 18 inches around inlet.
 - b. Construct wood framing with a minimum burial depth of 8 inches at each corner of the inlet.
 - c. Filter fabric shall include a wire mesh backing for structural support.
 - d. Place backfill in 6-inch compacted lifts.
 - e. Install a compacted earth check dam in the ditch line below the inlet if runoff bypassing the inlet will not flow to a sediment pond.
2. Drop Inlet Sediment Protection. Inlets may utilize an excavated drop inlet consisting of a 1- to 2-foot-deep excavation around the inlet to serve as a sediment trap.
 - a. Expanded trap volume shall be in accordance with the requirements for sediment traps contained in this specification.
 - b. Install 1-inch-diameter weep holes in the side of the inlet near the bottom of the excavated areas. Provide a gravel filter around weep holes. Weep holes shall be grouted before filling excavated area.
 - c. Remove accumulated sediment when it has reached 40 percent of the trap depth.

C. Curb Inlet Protection. Details are included in ODNR's Rainwater and Land Development manual.

1. Frame. Construct a wooden frame that is anchored to the soil located behind the curb.
2. Screen. Form a geotextile fabric screen with wire mesh backing to the concrete gutter and against the face of the curb. Extend the screen 2 feet beyond the inlet throat on either end and fasten to the frame.
3. Stone. Place 2-inch stone over the screen to prevent water from entering the inlet under or around the geotextile fabric.

3.7 ROCK CHANNEL PROTECTION. Provide rock channel protection at all storm outlets in accordance with ODOT Item 601.

3.8 TOP SOIL STOCKPILE. Provide temporary drainage diversion of runoff around the topsoil stockpile to control soil erosion. Provide silt fencing around stockpiles or cover stockpiles with tarps to prevent erosion for sediment control.

- 3.9 **CONSTRUCTION ENTRANCES/EXITS.** Install a stabilized pad of aggregate over geotextile fabric at all locations where construction vehicles leave construction areas onto surfaces where runoff is not checked by sediment controls, and at all points of egress to paved roads.

A. **Design**

1. **Bedding.** Provide a geotextile fabric bedding at the base of the construction entrance.
2. **Stone.** Place 2-inch stone in a layer 6 inches thick over the fabric bedding.
3. **Dimensions.** Entrance/exit pad shall be a minimum of 14 feet wide by 50 feet long.

- B. **Maintenance.** Apply additional stone as necessary to replenish the entrance/exit. Remove sediment from paved roads immediately through sweeping, scraping, or other appropriate measure.

3.10 **DEWATERING**

A. **General**

1. Give special attention to dewatering activities to minimize release of silt-laden water into the stream.
2. The discharges shall be free of sediment and released into only storm sewers, stream channels, or other stabilized drainage sources and not onto exposed soils or any other site where flows could cause further erosion.
3. If trench or ground water contains sediment, it shall pass through a sediment settling pond or other equally effective sediment control device, prior to being discharged from the construction site. Alternatively, sediment may be removed by settling in place or by de-watering into a sump pit, filter bag or comparable practice. Ground water which does not contain sediment or other pollutants is not required to be treated prior to discharge. However, care must be taken when discharging ground water to ensure that it does not become pollutant-laden by traversing over disturbed soils or other pollutant sources.

- 3.11 **ADDITIONAL MEASURES.** Select the sediment and erosion control measures utilized for a site based on the proposed construction activities, existing and proposed contours, site drainage system, and other site requirements or restrictions. Additional or alternative erosion and sediment control measures may be utilized with approval. Such measures include those specified in ODNr's Rainwater and Land Development manual.

END OF SECTION



Division of Surface Water - Notice of Termination (NOT) of Coverage Under
Ohio Environmental Protection Agency General NPDES Permit

<i>(Read accompanying instructions carefully before completing this form.)</i>		
<i>Submission of this NOT constitutes notice that the party identified in Section II of this form is no longer authorized to discharge into state waters under the NPDES general permit program. NOTE: All necessary information must be provided on this form. Do not use correction fluid on this form. Forms transmitted by fax will not be accepted. There is no fee associated with submitting this form.</i>		
I. Permit Information		
NPDES General Permit Number: OH		
Facility General Permit Number:		
II. Owner/Applicant Information/Mailing Address:		
Company (Applicant) Name:		
Mailing (Applicant) Address:		
City:	State:	Zip Code:
Contact Person:	Phone:	Fax:
Contact E-mail Address:		
III. Facility/Site Location Information		
Facility Name:		
Facility Address/Location:		
City:	State:	Zip Code:
County:	Township:	Section:
Facility Contact Person:	Phone:	Fax:
Contact E-mail Address:		
IV. Reason for Termination		
Transfer of Ownership ☐	Cease to Discharge ☐	Facility Closed ☐
Project Completed ☐	Obtained Individual Permit ☐	
V. Certifications		
Standard Certification:		
<i>I certify under penalty of law that all discharges authorized by the NPDES general permit have been eliminated or that I am no longer the operator of the facility. I understand that by submitting this NOT, I am no longer authorized to discharge under this general permit and that discharging pollutants to waters of the state without an NPDES permit is unlawful under ORC 6111.</i>		
Name (typed):	Title:	
Signature:	Date:	
Industrial Storm Water and Coal Mining Activity Certification Only:		
<i>I certify under penalty of law that all discharges associated with the identified facility that are authorized by the above referenced NPDES general permit have been eliminated, that I am no longer the operator of the facility, or in the case of a coal mine that the SMCRA bond has been released by ODNR-Division of Reclamation. I understand that by submitting this NOT, I am no longer authorized to discharge storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity to waters of the state is unlawful under ORC 6111 where the discharge is not authorized by an NPDES permit.</i>		
Name (typed):	Title:	
Signature:	Date:	
Storm Water Construction Activity Certification Only:		
<i>I certify under penalty of law that all elements of the storm water pollution prevention plan have been completed, the disturbed soil at the identified facility have been stabilized and temporary erosion and sediment control measures have been removed at the appropriate time, or that all storm water discharges associated with construction activity from the identified facility that are authorized by the above referenced NPDES general permit have otherwise been eliminated. I understand that, by submitting this NOT, I am no longer authorized to discharge storm water associated with construction activity by the general permit, and that discharging pollutants in storm water associated with construction activity to waters of the state is unlawful under ORC 6111 where the discharge is not authorized by an NPDES permit.</i>		
Name (typed):	Title:	
Signature:	Date:	

SECTION 01 74 23

CLEANING

PART 1 - GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.
- 1.2 **DESCRIPTION OF WORK**
 - A. **Scope of Work.** Throughout the construction period, maintain all areas of new and existing buildings and site constructed or affected by the work of the Contract in a standard of cleanliness as described in this section.
 - B. **Related Work Described Elsewhere.** In addition to standards described in this section, comply with all requirements for cleaning up as described in various other sections of these specifications.
- 1.3 **QUALITY ASSURANCE**
 - A. **Inspection.** Conduct daily inspections, and more often if necessary, to verify that requirements of cleanliness are being met.
 - B. **Codes and Standards.** In addition to the standards described in this section, comply with all pertinent requirements of governmental agencies having jurisdiction and comply with Occupational Safety and Health Administration (OSHA) Housekeeping Standards, Subpart C, Section 1926.25.
- 1.4 **SUBMITTALS** (Not used)
- 1.5 **JOB CONDITIONS** (Not used)
- 1.6 **DELIVERY, STORAGE, AND HANDLING** (Not used)
- 1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

- 2.1 **MATERIALS AND EQUIPMENT.** Provide all required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.
- 2.2 **COMPATIBILITY.** Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. General

1. Retain all stored items in an orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing the required protection of materials.
2. Do not allow the accumulation of scrap, debris, waste material, and other items not required for construction of the work.
3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
4. Comply with OSHA Section 1926-252 of Subpart H of Part 1926, Disposal of Waste Materials.
5. Provide adequate storage for all items awaiting removal from job site, observing all requirements for fire protection and protection of the environment.
6. Do not bury waste materials within the project site.

B. Site

1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material.
2. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site; restack, tidy, or otherwise service all arrangements to meet the requirements of Paragraph 3.1 A of this section.
3. Maintain the site in a neat and orderly condition at all times and comply with OSHA Housekeeping Standards, Subpart C, Section 1926.25.

C. Structures

1. Weekly, and more often if necessary, inspect the structures, pick up all scrap, debris, and waste material.
2. Weekly, and more often if necessary, sweep all interior spaces clean. Interpret "Clean" (for the purpose of this subparagraph) as meaning free from dust and other material capable of being removed by use of reasonable effort and hand-held broom, except that vacuum cleaning shall also be employed if dust accumulates on surfaces above floor.
3. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using all equipment and materials required to achieve the required cleanliness.
4. Following the installation of finish floor materials, clean finish floor daily (and more often if necessary) while work is being performed in the space. Interpret "clean" (for the purpose of this subparagraph) as meaning free from all foreign material which may be damaging to the finish floor material.

3.2 FINAL CLEANING

- A. **Definition.** Except as otherwise specifically provided, interpret "clean" (for the purpose of this paragraph) as meaning the level of cleanliness generally provided by skilled cleaners using commercial-quality building maintenance materials.
- B. **General.** Prior to completion of the work, remove from the job site all tools, surplus and testing materials, equipment, scrap, debris, temporary protection, and waste. Conduct final cleaning as described in paragraph 3.1 of this section.
- C. **Site.** Unless otherwise directed, broom-clean all paved areas on the site and all public paved areas directly adjacent to the site. Completely remove all resultant debris.
- D. **Structures**
 - 1. Exterior.
 - a. Visually inspect all exterior surfaces and remove all traces of soil, waste material, smudges, and other foreign matter.
 - b. Remove all traces of splashed materials from adjacent surfaces.
 - c. If necessary to achieve a uniform degree of exterior cleanliness, hose and brush down the exterior of the structure.
 - d. In the event of stubborn stains not removable with water, lightly sandblast to remove the stain.
 - 2. Interior.
 - a. Visually inspect all interior surfaces and remove all traces of soil, waste material, smudges, and other foreign matter.
 - b. Remove all traces of splashed materials from adjacent surfaces.
 - c. Remove all paint droppings, spots, stains, and dirt from finished surfaces.
 - d. Sweep, vacuum, and hand-dust all areas, including concealed surfaces and overhead spaces, to remove all dust.
 - 3. Glass. Clean all glass inside and outside.
 - 4. Polished surfaces. To all surfaces requiring the routine application of buffed polish, apply the polish recommended by the manufacturer of the material being polished.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.
- 1.2 **DESCRIPTION OF WORK.** Furnish and install cast-in-place concrete in accordance with the drawings and specifications.
 - A. **This section specifies** cast-in-place concrete, including formwork, reinforcing, mix design, accessories, placement procedures, joints, embedments, finishes, curing, supports for equipment and piping, and grout toppings for tanks.
 - B. **Other specification sections** may reference this section for other cast-in-place concrete items.
- 1.3 **QUALITY ASSURANCE**
 - A. **Standards.** Comply with the provisions of the following standards:
 1. ACI – American Concrete Institute.
 2. ASTM – American Society for Testing and Materials.
 3. CRSI – Concrete Reinforcing Steel Institute.
 4. AASHTO – American Association of State Highway and Transportation Officials.
 - B. **Concrete Testing Service.** Engage an acceptable laboratory to perform material evaluation tests and to design concrete mixes.
 - C. **Testing.** Materials and installed work may require testing and retesting at any time during progress of work. Retesting of rejected materials or installed work shall be done at Contractor's expense.
 - D. **Concrete Conference.** Prior to submittal of design mixes, conduct conference at project site to comply with the following:
 1. Review detailed requirements for preparing concrete design mixes.
 2. Determine procedures for satisfactory concrete operations.
 3. Review requirements for submittals, status of coordinating work, and availability of materials.
 4. Establish preliminary work progress schedule and procedures for materials inspection, testing, and certifications.

5. Request that representatives of each entity directly concerned with cast-in-place concrete attend conference, including, but not limited to, the following:
 - a. Contractor's superintendent.
 - b. Laboratory responsible for concrete mix design.
 - c. Laboratory responsible for field quality control.
 - d. Ready-Mix concrete supplier.
 - e. Concrete subcontractor.
 - f. Primary admixture manufacturers.
 - g. Engineer/Architect or Owner's Representative.
6. Concrete conference may be waived by the Engineer/Architect or Owner's Representative.

1.4 **SUBMITTALS.** Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.

A. Submittal Package No. 1 – Shop Drawings and Product Data

1. Product data for materials and items, such as cement, reinforcement, embedded forming accessories, admixtures, patching compounds, waterstops, joint systems, and curing compounds.
2. Reinforcement shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI SP-66 (88), "ACI Detailing Manual," showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures, and dowel reinforcement for masonry.
3. Concrete mix designs for each class of concrete to be used on the project including specifics regarding admixtures proposed for each mix design. Include concrete test reports to substantiate trial batch mixes or previous performance of the same mix design.
4. Materials Certificates.
 - a. Submit with the concrete mix design.
 - b. Signed by manufacturer certifying that each material item complies with or exceeds specified requirements.
 - c. Provide certification from admixture manufacturers that chloride content complies with specification requirements.
 - d. For Ground Granulated Blast-furnace Slag (GGBS), provide certifications as given paragraph 12 of ASTM C989 listed below:
 - a) Manufacture's report stating the results of tests made on samples.

- b) Test data on chlorine ion content of the GGBS.
 - e. Construction joint locations which clearly show where construction joints are intended to be placed in walls, slabs, columns, beams, at stairwells, etc.
 - f. Box Outs. Proposed locations.
- 5. Testing Laboratories. Submit the names of the testing laboratories proposed for use to perform the material evaluation tests and also to perform the field quality control testing. An ACI certified technician shall perform all concrete testing.

B. Submittal Package No. 2 – Batch Tickets

- 1. Submit batch tickets for each load of concrete used on the job that indicate the design mix, the project name, the date, the time of batching, and the truck number.

C. Submittal Package No. 3 – Test Reports

- 1. The concrete testing laboratory shall submit two copies of all concrete test reports directly.

1.5 JOB CONDITIONS

- A. **Coordination.** Coordinate installation of joint materials, embedded items, vapor retarders, etc., with placement of forms and reinforcing steel to prevent delays, errors, or omissions.
- B. **Reference Material.** Provide a copy of ACI SP-15, Field Reference Manual, in the field office at all times during concrete construction.
- C. **Climatic Conditions.** Perform placement and curing of concrete under various weather conditions in accordance with ACI 301, "Specifications for Structural Concrete for Buildings," ACI 305, "Hot Weather Concreting," and ACI 306, "Cold Weather Concreting," except as modified herein.

1.6 DELIVERY, STORAGE, AND HANDLING. Comply with ACI 304, "Recommended Practice for Measuring, Mixing, and Placing Concrete."

1.7 SPECIAL WARRANTY (Not used)

PART 2 – PRODUCTS

2.1 MATERIALS

A. Forms

- 1. Exposed finish concrete forms shall be plywood, metal, metal framed plywood faced, or other acceptable panel type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest

practicable sizes to minimize number of joints and to conform to joint system shown.

2. Unexposed finish concrete forms shall be plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.
3. Cylindrical column and support forms shall be metal, fiberglass reinforced plastic, or paper or fiber tubes.
 - a. When used, provide paper or fiber tubes of laminated plies with water resistant adhesive and wax impregnated exterior for weather and moisture protection.
 - b. Provide sufficient wall thickness to resist wet concrete loads without deformation.

B. **Form coatings.** Commercial formulation form coating compounds with a maximum volatile organic compound (VOC) of 350 milligrams per liter (mg/l) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

C. **Form ties.** Factory-fabricated, adjustable length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal.

1. Provide units that will leave no metal closer than 1 inch to exposed surface.
2. Provide ties that, when removed, will leave holes not larger than 1 1/2 inch diameter in concrete surface.

D. **Reinforcing Materials**

1. Reinforcing Bars. ASTM A 615, including Supplemental Requirement S1, or A 617; Grade 60, deformed.
2. Welded Wire Fabric. ASTM A 1064, welded steel wire fabric, provided in flat sheets.
3. Supports for Reinforcement. Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use steel bar supports or precast concrete bar supports complying with CRSI specifications.
 - a. For slabs on grade, use steel bar supports with sand plates or horizontal runners or precast concrete bar supports where base material will not support chair legs.
 - b. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs that are plastic protected (CRSI, Class 1) or stainless steel (CRSI, Class 2).

E. **Concrete Materials**

1. Portland Cement. ASTM C 150, Type I or Type II in areas where alkali-aggregate reaction is a problem. Use one brand of cement throughout project.
2. Fly Ash. ASTM C 618, Type C or Type F including supplementary optional physical requirements, except loss on ignition shall not exceed 3 percent.
3. Ground Granulated Blast-furnace Slag (GGBS). ASTM C989, grade 100 or grade 120.
4. Normal Weight Aggregates. ASTM C 33 and as herein specified.
 - a. For exposed concrete, provide aggregates from a single source.
 - b. For exterior exposed surfaces, do not use fine or coarse aggregates containing deleterious substances which might cause spalling.
 - c. Fine Aggregate.
 - 1) Fine aggregate shall consist of natural sand or manufactured sand.
 - 2) Maximum loss during an AASHTO T104 5-cycle sulfate soundness test shall be 10 percent.
 - d. Coarse Aggregate.
 - 1) Coarse aggregate shall consist of crushed rock, gravel, or crushed gravel.
 - 2) Grading. The coarse aggregate shall conform to requirements for Size 57, unless otherwise approved.
 - 3) Deleterious substances shall not exceed the percentages for Class 4S.
 - 4) Maximum loss during an AASHTO T104 5-cycle sulfate soundness test shall be 15 percent.
 - 5) Maximum wear during an AASHTO T-96 Los Angeles abrasion test shall be 40 percent.
5. Water. Potable.
6. Admixtures.
 - a. Air-Entraining Admixture.
 - 1) ASTM C 260, certified by manufacturer to be compatible with other required admixtures.

- 2) Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a) Darex II or Daravair, W.R. Grace & Co.
 - b) MB-VR or Micro-Air, Master Builders, Inc.
 - c) Sika AER, Sika Corp.
 - d) AEA-92 or Air Mix 200, Euclid Chemical Co.
- b. Water-Reducing Admixture.
 - 1) ASTM C 494, Type A.
 - 2) Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a) Eucon WR-75 or WR-89, Euclid Chemical Co.
 - b) WRDA with Hycol, or Daracem-55, W.R. Grace & Co.
 - c) Pozzolith 220-N, Pozzolith 322-N, or Polyheed, Master Builders, Inc.
 - d) Plastokrete 161, Sika Corp.
- c. High-Range Water-Reducing (HRWR) Admixture (Super Plasticizer).
 - 1) ASTM C 494, Type F or Type G.
 - 2) Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a) Eucon 37, Euclid Chemical Co.
 - b) Daracem 19, Daracem ML330, or Daracem ML500, W.R. Grace & Co.
 - c) Rheobuild, Master Builders, Inc.
 - d) Sikament 300, Sika Corp.
- d. Noncorrosive, Nonchloride Accelerating Admixture.
 - 1) ASTM C 494, Type C or E.
 - 2) Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a) Accelguard 80, Euclid Chemical Co.
 - b) Polaset, W.R. Grace & Co.
 - c) Pozzutec 20, Master Builders, Inc.

- e. Water-Reducing, Retarding Admixture.
 - 1) ASTM C 494, Type D.
 - 2) Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a) Eucon Retarder 75, Euclid Chemical Co.
 - b) Daratard-17, W.R. Grace & Co.
 - c) Pozzolith R, Master Builders, Inc.
 - d) Plastiment, Sika Corporation.
- f. Crystalline Waterproofing Admixture. Subject to compliance with requirements, products that may be incorporated in the work include the following:
 - 1) Penetron ADMIX.
 - 2) Aquafin-IC.
 - 3) Kryton KIM.
 - 4) Xypex ADMX C-Series.
 - 5) BASF Rheomac 300D.

2.2 ACCESSORIES

- A. **Reglets.** Where resilient or elastomeric sheet flashing or bituminous membranes are terminated in reglets, provide reglets of not less than 0.0217-inch-thick (26-gauge) galvanized sheet steel. Fill reglet or cover face opening to prevent intrusion of concrete or debris.
- B. **Sand Cushion.** Clean, manufactured or natural sand conforming to ASTM C 33 or C 144.
- C. **Vapor Retarder.** ASTM E 1745 Class A Compliant with a permeance of 0.01 before and after mandatory conditioning as required by (ASTM E 1745 Section 7.1 and Sub-paragraphs 7.1.1 – 7.1.5).
 - 1. Provide vapor retarder cover over prepared base material where indicated below slabs on grade.
 - 2. Subject to compliance with these specifications, the vapor retarder may be one of the following:
 - a. Stego Wrap 15 mil by Stego Industries, LLC
 - b. Vapor Flex by Layfield
 - c. Moistop Ultra 15 by Fortifiber Industries
- D. **Chemical Hardener.** Colorless aqueous solution containing a blend of magnesium fluosilicate and zinc fluosilicate combined with a wetting agent, containing not less than 2 pounds of fluosilicates per gallon.

1. Use hardener on existing concrete where noted.
2. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. Surfhard, Euclid Chemical Co.
 - b. Lapidolith, Sonneborn-Rexnord.
 - c. Burk-O-Lith, The Burke Co.
 - d. Fluohard, L&M Construction Chemical, Inc.

E. Sealer/Dustproofers

1. Floor hardener compound for new concrete shall be an acrylic containing not less than 14 percent solids.
2. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. Super Diamond Clear VOX, Euclid Chemical Company.
 - b. Dress and Seal WB30, L&M Construction Chemicals, Inc.

F. Absorptive Cover. Burlap cloth made from jute or kenaf, weighing approximately 9 ounces per square yard, complying with AASHTO M 182, Class 2.

G. Moisture-Retaining Cover. One of the following complying with ASTM C 171.

1. Waterproof paper.
2. Polyethylene film.
3. Polyethylene coated burlap.

H. Curing Compound. Clear styrene acrylate type, 25 percent solids content minimum.

1. Submit test data from an independent testing laboratory indicating a maximum moisture loss of 0.55 kilograms (kg) per square meter when applied at a coverage rate of 200 square feet per gallon.
2. Verify compatibility of curing compound with finishes to be used.
3. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. Super Diamond Clear VOX, Euclid Chemical Company.
 - b. Dress and Seal WB30, L&M Construction Chemicals, Inc.

I. Evaporation-Control Compound

1. Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.

2. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. Aquafilm, Conspec Marketing and Mfg. Co.
 - b. Euco-bar, Euclid Chemical Co.
 - c. E-Con, L&M Construction Chemicals, Inc.
 - d. Confilm, Master Builders, Inc.

J. Bonding Compound

1. Polyvinyl acetate or acrylic base.
2. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. Polyvinyl Acetate (Interior Only).
 - 1) Superior Concrete Bonder, Dayton Superior Corp.
 - 2) Euco Weld, Euclid Chemical Co.
 - 3) Weld-Crete, Larsen Products Corp.
 - 4) Everweld, L&M Construction Chemicals, Inc.
 - b. Acrylic or Styrene Butadiene.
 - 1) SBR Latex, Euclid Chemical Co.
 - 2) Daraweld C, W.R. Grace & Co.
 - 3) Acryl-Set, Master Builders, Inc.
 - 4) Stonlock LB2, Stonhard, Inc.

K. Epoxy Adhesive

1. ASTM C 881, two-component material suitable for use on dry or damp surfaces.
2. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. Euco Epoxy System #452 or #620, Euclid Chemical Co.
 - b. Epabond, L&M Construction Chemicals, Inc.
 - c. Coneresive 1001, Master Builders, Inc.
 - d. Sikadur 32 Hi-Mod, Sika Corp.

L. Expansion Joint and Isolation Joint Material. Use one of the following unless noted otherwise.

1. Self-expanding cork conforming to ASTM D 1752, Type III.
2. Cellular fiber-asphalt conforming to ASTM D 1751.
3. Neoprene/SBR polymer conforming to ASTM D 1056-67.

2.3 MIXES

A. General

1. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301.
2. If trial batch method used, retain an acceptable independent testing facility for preparing and reporting proposed mix designs.
3. The testing facility shall not be the same as used for field quality control testing.
4. Submit mix designs of each proposed mix for each class of concrete at least 15 days prior to start of work.
5. Do not begin concrete production until proposed mix designs have been reviewed.
6. Chloride Ion content. Provide cement, fly ash, GGBS and admixtures that contain a maximum of 0.05 percent chloride ions by weight of cement when tested in accordance with AASHTO T260. Certificate from manufacturers of the above materials shall be provided prior to mix design approval.
7. Where the concrete alkali aggregate reaction resistance and/or sulfate resistance is noted on the drawings the concrete shall conform to the following:
 - a. Where alkali aggregate reaction resistance is required the concrete shall contain do not add less than 20 percent fly ash by weight.
 - b. Where sulfate resistance is required the concrete shall contain do not add less than 40 percent GGBS by weight.
8. Limit use of fly ash not to exceed 25 percent of cement content by weight.
 - a. When used, fly ash shall replace cement at a 1:1 ratio for Class C fly ash and a 1.25:1 ratio for Class F fly ash (Class F fly ash to cement).
 - b. Adjust weights of concrete materials to provide the correct yield.
9. Limit use of GGBS not to exceed 50 percent of cement content by weight.
10. When GGBS and fly ash are both used in the concrete mix, the combination shall not exceed 50 percent of cement content by weight. Fly ash shall not exceed 25 percent of the cement content by weight in the combination.

- B. **Design Mixes.** Provide normal weight concrete with the following properties, unless otherwise indicated. Tolerance for air content shall be ± 1.5 percent.
1. Foundations, Walls, Piers, & Interior Slabs-On-Grade
 - a. 4,500 psi, 28-day compressive strength.
 - b. w/c ratio, 0.45 maximum; minimum cementitious material, 540 pounds per cy.
 - c. 6 percent air.
 2. Frost-Free-Slabs & Approach Slabs
 - a. 5,000 psi, 28-day compressive strength.
 - b. w/c ratio, 0.40 maximum; minimum cementitious material, 564 pounds per cy.
 - c. 6 percent air.
- C. **Slump Limits.** Proportion and design mixes to result in concrete slump at point of placement as follows:
1. Ramps and sloping surfaces. Less than 3 inches.
 2. Reinforced foundation systems. 2 to 4 inches.
 3. Concrete containing HRWR admixture (Superplasticizer). Less than 8 inches after addition of HRWR to site verified 2-inch to 3-inch slump concrete without HRWR.
 4. Other concrete. Less than 4 inches for slabs and less than 5 inches for walls, curbs, bases, and other miscellaneous concrete.
- D. **Chloride Content.** The maximum water-soluble chloride ion content, expressed as a percent by weight of cement contributed by all ingredients of the concrete mix shall not exceed 0.10 percent.
- E. **Controlled Density Fill or Controlled Low-Strength Material.** The fine aggregates shall be fine enough to stay in suspension in the mixture to the extent required for proper flow. Provide with the following properties, unless otherwise indicated:
1. 100 psi, 28-day compressive strength.
 - a. Cement, 100 pounds.
 - b. Fly Ash, 250 pounds.
 - c. Fine Aggregate, Saturated Surface Dry, 2,800 pounds.
 - d. Water, 500 pounds maximum.
 2. It is necessary for bleed water to appear on the surface immediately after the fill is struck off.
 - a. A delay in bleeding indicates there are too many fines in the mixture, so reduce the fly ash quantity in increments of 50 pounds until mixture is bleeding freely.

- b. Add approximately 60 pounds of sand to replace each 50-pound increment of fly ash to maintain the original yield.
- F. **Dry Pack Mortar.** Mix dry pack, consisting of one part portland cement to 2 1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing.
- G. **Cement Mortar.** A mixture of sand, cement, and water in the same proportions used for the concrete being placed, but omit all coarse aggregate.
- H. **Adjustment to Concrete and Mixes.** Request mix design adjustments when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as approved. Submit laboratory test data for revised mix design and strength results for acceptance before using in work.
- I. **Admixtures.** Use of Admixtures.
 - 1. Use water-reducing admixture for placement and workability in all classes of concrete unless noted otherwise.
 - 2. A noncorrosive nonchloride accelerating admixture may be used in concrete slabs placed at ambient temperatures below 50 degrees Fahrenheit (° F.) when approved.
 - 3. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content as indicated in the design mix.
- J. **Concrete Mixing.** Ready Mix Concrete. Comply with requirements of ASTM C 94 and as specified.
 - 1. When air temperature is between 85° F. and 90° F., mixing and delivery time shall not exceed 75 minutes.
 - 2. When air temperature is above 90° F., mixing and delivery time shall not exceed 60 minutes unless approved otherwise.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. **Tolerances.** Unless otherwise specified, tolerances shall be in accordance with ACI 117 and ACI 301.
- B. **Inspection**
 - 1. Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in.
 - 2. Notify other trades to permit installation of their work; cooperate with other trades in setting such work.
 - 3. Verify that all wood, dirt, foreign objects, and all other debris have been removed from inside the formwork.
 - 4. Verify that reinforcing steel is spaced to provide the proper coverage against forms and against earth for slabs on grade.

5. When requested, provide documentation of inspection prior to placing concrete.
- C. **Site and Weather Conditions.** Do not place concrete when site conditions exist such as standing water, extreme heat or cold, etc., unless the proper precautions have been taken to properly place and protect concrete as recommended by ACI and as acceptable. Do not place concrete on frozen ground.

3.2 PREPARATION

A. Forms

1. General. Design, erect, support, brace, and maintain formwork to support vertical and lateral, static and dynamic loads that might be applied until concrete structure can support such loads. Maintain formwork construction tolerances complying with ACI 347.
2. Forms.
 - a. Construct forms to sizes, shapes, lines, position, elevation, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures.
 - b. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work.
 - c. Use selected materials to obtain required finishes.
 - d. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.
3. Fabrication of Forms.
 - a. Fabricate forms for easy removal without hammering or prying against concrete surfaces.
 - b. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces.
 - c. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only.
 - d. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.
4. Openings.
 - a. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete.
 - b. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar.
 - c. Locate temporary openings in forms at inconspicuous locations.

5. Exposed Corners and Edges. Chamfer exposed corners and edges using wood, metal, PVC, or rubber chamfer strips to produce uniform smooth lines and tight edge joints.
6. Provisions for Other Trades.
 - a. Provide openings in concrete formwork to accommodate work of other trades.
 - b. Determine size and location of openings, recesses, and chases from trades providing such items.
 - c. Accurately place and securely support items built into forms.
7. Cleaning and Tightening.
 - a. Thoroughly clean forms and adjacent surfaces to receive concrete.
 - b. Remove wood, sawdust, dirt, or other debris just before concrete is placed.
 - c. Retighten forms and bracing before concrete placement as required to prevent mortar leaks and maintain proper alignment.
8. Form Coatings. Coat contact surfaces of forms with an approved, nonresidual, low VOC, form coating compound before reinforcement is placed.
 - a. Do not allow excess form coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.
 - b. Coat steel forms with a nonstaining, rust preventative material. Rust stained steel formwork is not acceptable.
 - c. Form coatings for use in water treatment plants shall be nontoxic after 30 days from the date the forms are removed.

B. Reuse of Forms

1. Clean and repair surfaces of all forms to be reused in work. Split, frayed, delaminated, or otherwise damaged form facing material will not be acceptable for exposed surfaces.
2. Apply form coating compound as specified for new formwork.
3. Successive Reuse.
 - a. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints.
 - b. Align and secure joint to avoid offsets.
 - c. Do not use "patched" forms for exposed concrete surfaces except as approved.

3.3 **INSTALLATION**

A. Vapor Retarder Installation

1. Install vapor retarder where shown per ASTM E/643-10.
2. Following leveling and tamping of granular base for slabs on grade, place vapor retarder sheeting with longest dimension parallel with direction of pour.
3. Lap joints 6 inches and seal vapor barrier joints with manufacturer's recommended mastic and/or pressure sensitive tape.

B. Placing Reinforcement

1. Comply with CRSI's recommended practice for "Placing Reinforcing Bars" for details and methods of reinforcement placement and supports and as herein specified.
2. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.
3. Installation.
 - a. Accurately position, support, and secure reinforcement against displacement.
 - b. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved.
 - c. Place reinforcement to obtain at least minimum coverages for concrete protection as noted in ACI 301.
 - d. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations.
 - e. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
 - f. Install welded wire fabric in lengths as long as practicable.
 - g. Lap adjoining pieces at least one full mesh plus 2 inches or 8 inches and lace splices with wire.
 - h. Offset laps of adjoining widths to prevent continuous laps in either direction.
 - i. Avoid cutting or puncturing vapor retarder barrier during reinforcement placement and concreting operations.

C. Joints

1. Construction Joints. Locate and install construction joints as indicated or, if not indicated, locate so as not to impair strength and appearance of the structure.
 - a. Provide keyways 1-1/2 inches deep in construction joints in walls and slabs and between walls and footings. Accepted bulkheads designed for this purpose may be used for slabs.

- b. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as otherwise indicated.
 - c. The maximum length of wall pours shall not exceed 40 feet, and slab pours shall not exceed 40 feet in length or width.
 - d. Bond fresh concrete to hardened new concrete as follows:
 - 1) For horizontal joints, place new concrete on a 1-inch layer of cement mortar evenly spread over the previously placed concrete. Thoroughly clean and remove laitance of previously placed concrete.
 - 2) For vertical joints, thoroughly clean the surface of the hardened concrete and remove all laitance prior to placing new concrete.
 - e. If noted, prior to placement of new concrete against old existing concrete, apply bonding agent to surface of old concrete, if accessible, immediately before placement of new concrete.
2. Isolation Joints in Slabs-on-Ground. Construct isolation joints as indicated in slabs-on-ground at points of contact between slabs-on-ground and vertical surfaces, such as column pedestals, foundation walls, grade beams, and elsewhere as shown. Fill joints where noted with sealant specified in Division 7 sections of these specifications.
3. Contraction (Control) Joints in Slabs-on-Ground.
- a. Construct contraction joints in slabs-on-ground to form panels of patterns as shown.
 - b. Use saw cuts 1/8 inch wide by 1/4 slab depth or insert premolded plastic, hardboard, or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface unless otherwise indicated.
 - c. Tool slab edges round on each side of insert.
 - d. After concrete has cured, remove inserts and clean groove of loose debris.
 - 1) Saw-cut as soon as possible after slab finishing without dislodging aggregate.
 - 2) If joint pattern not shown, provide joints not exceeding 15 feet in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays).
 - 3) Provide joint, filler, and sealant materials where shown.

D. Installation of Embedded Items

1. Set and build into the work, anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by other prime Contractors and suppliers of items to be attached thereto.
2. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, relieving angles, and other conditions.
3. Set edge forms, bulkheads, and intermediate screed strips for slabs to obtain required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting type screeds.

E. Concrete Placement

1. General. Comply with ACI 304, "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete," and as specified herein.
 - a. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete that has hardened sufficiently to cause the formation of seams or planes of weakness, or to be resistant to the penetration of a vibrator.
 - b. If a section cannot be placed continuously, provide construction joints as specified herein.
 - c. Deposit concrete to avoid segregation at its final location.
2. Placing Concrete in Forms. Deposit concrete in forms in horizontal layers not deeper than 24 inches and in a manner to avoid inclined construction joints.
 - a. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
 - b. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
 - c. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
 - d. Do not use vibrators to transport concrete inside forms.
 - e. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine.
 - f. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer.
 - g. Do not insert vibrators into lower layers of concrete that have begun to set.
 - h. At each insertion, limit duration of vibration to time necessary to consolidate concrete around reinforcement and other embedded items without causing segregation of mix.

3. Placing Concrete Slabs. Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
 - a. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - b. When epoxy-coated reinforced steel is used, vibrators shall have nonmetallic heads.
 - c. Bring slab surfaces to correct level with straightedge and strike off. Use highway straightedge, bull floats, darbies, or other means to obtain a smooth surface which is free of humps or hollows and that conforms to the required flatness and levelness.
 - d. Do not disturb slab surfaces prior to beginning finishing operations.
 - e. Maintain reinforcing in proper position during concrete placement.
4. Protection for Slab Construction. Ensure that the concrete floor moisture levels do not exceed flooring manufacturer's recommended moisture level.
 - a. Be responsible for controlling the moisture content of interior concrete slabs. Achieve each respective flooring manufacturer's specifications prior to installation. Conduct calcium chloride absorption rate tests in sufficient number to properly substantiate compliance. No additional construction time or extra costs will be approved for failure to satisfy this requirement.
 - b. Follow construction practices that will help control the moisture in the slabs (i.e., a low water-to-cement ratio, careful installation of the vapor barrier, properly compacted subgrade free of standing water or mud, surface protection for completed slabs, proper temporary heating and ventilation).
 - c. Once the building is enclosed, control the humidity level in spaces (dew point temperature should be 20 degrees below the surface temperature of the slab). If necessary, include the use of desiccant dehumidifiers.
5. Cold Weather Placing. Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - a. When air temperature has fallen to or is expected to fall below 40° F., uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature between 50° F. and 80° F. at point of placement.
 - b. Do not use frozen materials or materials containing ice or snow.
 - c. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

- d. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
- 6. Hot Weather Placing. When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
 - a. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90° F. Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is included in the total amount of mixing water. Use of liquid nitrogen to cool concrete is allowed.
 - b. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
 - c. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.
 - d. Use water reducing retarding admixture when required by high temperatures or other adverse placing conditions, when acceptable.
 - e. Use evaporation control compound in accordance with manufacturer's recommendations or fogging.
- 7. Adjusting Concrete Slump at Job Site.
 - a. Slump Greater than Specified. Do not use concrete with slump greater than specified.
 - b. Slump Less than Specified. If on arrival at the job site, the slump of the concrete is less than specified, the following remedies may be used.
 - 1) Add water only if the maximum specified w/c ratio is not exceeded.
 - 2) Accompany additional water by a quantity of cement sufficient to maintain the specified w/c ratio.
 - 3) Add an approved water reducing admixture.

F. Controlled Density Fill or Controlled Low-Strength Material Placement

- 1. General. Unless noted otherwise, place controlled density fill in overexcavated areas under slabs, in utility trenches within roadways, and as directed.
- 2. Mixing Equipment. Provide sufficient mixing capacity to permit fill to be placed without interruption.
- 3. Placing Fill.

- a. Discharge flowable fill from the mixer by any reasonable means into the space to be filled.
- b. Bring up the fill material uniformly to the fill line shown or as directed.
- c. Placing of any material over low strength fill may commence as soon as the surface water is gone or as directed.

G. Slab Finishes

1. Finish. Finish slab surfaces in accordance with the schedule below unless shown otherwise.

Location	Type of Finish
Slabs to be exposed to view or covered with resilient flooring, carpet, ceramic or quarry tile, paint or other thin film finish coating system	Trowel finish after float finishing
Exterior concrete platforms, steps, ramps	Float finish followed by nonslip broom finish

2. Floor Levelness, General. Floor levelness requirements below do not apply to sloped slabs or unshored slabs on metal deck.
3. Float Finish.
 - a. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating.
 - b. Begin floating, using float blades or float shoes only, when surface water has disappeared, and/or when concrete has stiffened sufficiently to permit operation of power driven floats.
 - c. Consolidate surface with power driven floats or by hand floating if area is small or inaccessible to power units.
 - d. Check and level surface plane to tolerances of Ff 25 - Fl 20.
 - e. Cut down high spots and fill low spots.
 - f. Uniformly slope surfaces to drains.
 - g. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.
4. Trowel Finish.
 - a. After floating, begin first trowel finish operation using a power driven trowel.
 - b. Begin final troweling when surface produces a ringing sound as trowel is moved over surface.
 - c. Consolidate concrete surface by final hand troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances of Ff 50 - Fl 35.
 - d. Grind smooth surface defects that would telegraph through applied floor covering system.

5. Trowel and Fine Broom Finish. Apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.
6. Nonslip Broom Finish. Immediately after float finishing, slightly roughen concrete surface by brooming with stiff fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer/Architect before application.
7. Chemical Hardener. Apply chemical hardener to existing interior concrete floors where indicated.
 - a. Clean floors and allow to dry before applying hardener.
 - b. Apply proprietary chemical hardeners, in accordance with manufacturer's printed instructions.
 - c. After final coat of chemical hardener solution is applied and dried, remove surplus hardener by scrubbing and mopping with water.
8. Sealer/Dustproofer Finish.
 - a. Coat all exposed surfaces and floors within buildings which will be subject to pedestrian or vehicular traffic under normal operation.
 - b. Accomplish this by applying a liquid sealer/dustproofer in three applications in accordance with the manufacturer's directions.
 - c. Apply the sealer/dustproofer as late as possible and just prior to completion of construction.

H. **Miscellaneous Concrete Items**

1. Filling In Holes and Openings.
 - a. Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place.
 - b. Mix, place, and cure concrete as herein specified, to blend with in-place construction.
 - c. Provide other miscellaneous concrete filling shown or required to complete work.
2. Equipment Bases and Foundations. Provide machine and equipment bases and foundations as shown. Set anchor rods for machines and equipment complying with diagrams or templates of manufacturer furnishing machines and equipment.

3.4 **CONCRETE SURFACE REPAIRS**

- A. **Patching Defective Areas.** Repair and patch defective areas and plug form tie holes with cement mortar immediately after removal of forms, when acceptable.

1. Cut out honeycomb, rock pockets, and voids over 1/4 inch in any dimension down to solid concrete but in no case to a depth of less than 1 inch.
 - a. Make edges of cuts perpendicular to the concrete surface.
 - b. Thoroughly clean, dampen with water, and brush coat the area to be patched with specified bonding compound.
 - c. Place patching mortar before bonding compound has dried.
 2. For exposed-to-view surfaces, blend white portland cement and standard portland cement so that, when dry, patching mortar will match color surrounding.
 - a. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching.
 - b. Compact mortar in place and strike-off slightly higher than surrounding surface.
 - c. After shrinkage has occurred, grind surface until flush.
- B. **Repair of Formed Surfaces.** Remove and replace concrete having defective surfaces if defects cannot be repaired satisfactorily. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface, and stains and other discolorations that cannot be removed by cleaning.
- C. **Repair of Unformed Surfaces.** Repair or replace supported slabs that fail to meet the specified finish requirements.
1. Correct levelness and flatness, and low and high areas as herein specified.
 2. For slabs on grade, remove slab between control joints and replace with concrete slab meeting floor finish and tolerances.
 3. For all other unformed surfaces, repair as follows:
 - a. Repair surface defects that affect the durability of the concrete. These include crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through nonreinforced sections regardless of width, spalling, popouts, honeycomb, rock pockets, and other objectionable conditions.
 - b. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.
 - c. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with patching compound.
 - d. Finish repaired areas to blend into adjacent concrete.

- e. Underlayment compounds may be used when acceptable.
- f. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete.
 - 1) Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4 inch clearance all around.
 - 2) Dampen concrete surfaces in contact with patching concrete and apply bonding compound.
 - 3) Mix patching concrete of same materials to provide concrete of same type or class as original concrete.
 - 4) Place, compact, and finish to blend with adjacent finished concrete.
 - 5) Cure in same manner as adjacent concrete.

D. **Miscellaneous Repairs.** Repair isolated random cracks and single holes not over 1 inch in diameter by dry pack method.

- 1. Groove top of cracks and cut out holes to sound concrete and clean of dust, dirt, and loose particles.
- 2. Dampen cleaned concrete surfaces and apply bonding compound.
- 3. Place dry pack mortar before bonding compound has dried.
- 4. Compact dry pack mixture in place and finish to match adjacent concrete.
- 5. Keep patched area continuously moist for not less than 72 hours.

E. **Approval.** Perform structural repairs with prior approval for method and procedure, using specified epoxy adhesive and mortar.

F. **Alternative Repair Methods.** Repair methods not specified above may be used, subject to acceptance.

3.5 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. General

- 1. Employ an approved testing laboratory to perform tests and submit test reports.
- 2. ACI Grade 1 certified technician employed by the testing laboratory shall be present during the placing of all concrete.
- 3. The concrete testing laboratory shall submit two copies of all test reports directly to the Engineer/Architect.

B. **Sampling Fresh Concrete.** Sample concrete in accordance with ASTM C 172, except modified for slump to comply with ASTM C 94.

- 1. Slump. Perform slump tests at the point of truck discharge prior to adding plasticizers in accordance with ASTM C 143.

- a. For each class of concrete, perform one test for each compressive strength test and additional tests when concrete consistency seems to have changed.
 - b. If the slump is adjusted at the job site, the concrete testing agency shall be responsible for reporting the following.
 - 1) Method used to adjust slump.
 - 2) Quantity of each material added.
 - 3) Resulting slump.
2. Air Content. Perform daily for each class of concrete placed in accordance with ASTM C 173 volumetric method for lightweight concrete; ASTM C 231 pressure method for normal weight concrete; one test for each compressive strength test, one test for the first load of each type of air entrained concrete delivered, and one test for each truck when air content is adjusted until consistent results are obtained.
3. Concrete Temperature. Test hourly when air temperature is 40° F. and below, when 80° F. and above, and each time a set of compressive test specimens is made.
4. Compressive Test Specimen. Perform in accordance with ASTM C 31 and as follows:
- a. Prepare one set of four standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field cured test specimens are required. Contractor may also prepare field cured test specimens to be used for early form removal.
 - b. Prepare one set of cylinders for each 100 cy of concrete or fraction thereof, of each concrete class placed in any one day.
 - c. Perform compressive strength tests in accordance with ASTM C 39. Test one specimen at 7 days, and two specimens at 28 days, and hold one specimen in reserve for later testing if required.
 - d. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.
 - e. When total quantity of a given class of concrete is less than 50 cy, Engineer/Architect may waive strength test if adequate evidence of satisfactory strength is provided.
 - f. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
 - g. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.

- C. **Compressive Strength Test Reporting.** Report test results in writing to Engineer/Architect, Ready-Mix producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.
- D. **Flatness and Levelness.** Conduct random tests for flatness and levelness in accordance with ASTM E 1155 within 24 hours after final finish and as directed. Pay the cost for testing and any retesting after the defects are corrected.
- E. **Floor Slope.** Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having required slope within 24 hours after final finish and as directed.
- F. **Nondestructive Testing.** Impact hammer, ultrasonic pulse velocity, or other nondestructive testing device may be permitted if approved, but shall not be used as the sole basis for acceptance or rejection.
- G. **Additional Tests.** The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure.
 - 1. These tests shall be as directed.
 - 2. Testing service shall conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.
 - 3. Be responsible for all costs associated with such tests.

3.6 DEMONSTRATION

- A. **General.** Prior to final acceptance of concrete work, demonstrate to representatives of the Owner and the Engineer/Architect that there are no mechanical defects or damaged areas and that concrete exposed to view is acceptable as to function and appearance.
 - 1. **Walls and Other Formed Surfaces.** Representatives of the Owner, Contractor, and Engineer/Architect shall review concrete work to verify that tie holes and air voids have been patched, seams have been ground smooth, all surface defects have been repaired, and all rubbed or rubbed and painted surfaces are acceptable in appearance.
 - 2. **Floors.**
 - a. Representatives of the Owner, Contractor, and Engineer/Architect shall review concrete work to verify that all surface defects have been repaired, all stains removed, residue from floor sealer/dustproof or chemical hardener has been removed, and that the required finish is acceptable.

- b. Where requested, flood selected areas of floor to a depth satisfactory to demonstrate that the area or areas drain properly to the floor drains and sumps and that there are no areas ponding water outside acceptable tolerances.
- c. Furnish water for testing and convey it to the areas being examined.

B. **Repair or Replacement of Defective Work.** Correct concrete work which is unacceptable in accordance with paragraph 3.4 of this section. Replace concrete which cannot be repaired satisfactorily in an acceptable manner at no additional cost to the Owner.

3.7 CONCRETE CURING AND PROTECTION

A. **General.** Protect freshly placed concrete from premature drying and excessively cold or hot temperatures. In hot, dry, and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation control compound applied in accordance with manufacturer's instructions.

B. **Curing Duration**

- 1. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing.
- 2. Keep continuously moist for not less than 7 days.
- 3. Maintain concrete temperatures as recommended in ACI 301 throughout the curing period.

C. **Curing Methods.** Perform curing of concrete by curing compound, by moist curing, by moisture-retaining-cover curing, and by combinations thereof in accordance with the schedule below unless noted otherwise.

- 1. If unspecified, all methods specified below are acceptable.
- 2. Prior to use of curing compound on any surface, verify compatibility between curing compound and finish surface treatment.

Location	Curing Method
Floors and other unformed concrete surfaces	Any specified curing method
Formed concrete surfaces	Moist curing prior to form removal, followed by any of the methods specified below
All other concrete	Any specified curing method

- 3. Moisture Curing. Provide moisture curing by following methods:
 - a. Keep concrete surface continuously wet by with a continuous water fog spray.
 - b. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet.

- c. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4-inch lap over adjacent absorptive covers.
- 4. Moisture-Retaining-Cover Curing. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
- 5. Curing Compound. Provide curing compound as follows:
 - a. Apply specified curing compound to concrete as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared).
 - b. For formed surfaces, apply curing compound immediately after form removal.
 - c. Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's directions. Apply in two coats, spread in perpendicular directions.
 - d. Recoat areas subjected to heavy rainfall within 3 hours after initial application.
 - e. Maintain continuity of coating and repair damage during curing period.
 - f. Use curing compounds that will not affect finish materials applied directly to concrete.
 - g. Do not use curing compounds on surfaces which are to be covered with coating material applied directly to concrete, chemical hardener, waterproofing, dampproofing, membrane roofing, flooring (such as ceramic or quarry tile, glue down carpet that is not compatible with curing compound), painting, and other coatings and finish materials, unless otherwise approved.

3.8 REMOVAL OF FORMS

- A. **Formwork which is not supporting** the weight of concrete, such as sides of beams, walls, columns, and similar parts of the work may be removed after cumulatively curing at not less than 50° F. for 24 hours, provided concrete is sufficiently hard not to be damaged by form removal operations, and provided curing and protection operations are maintained.
- B. **Formwork supporting weight** of concrete, such as beam soffits, joists, slabs, and other structure elements, may not be removed in less than 14 days and concrete has attained at least 75 percent of the design 28-day minimum compressive strength. Determine potential compressive strength of in-place concrete by testing field cured specimens representative of concrete location or members.
- C. **Form facing material may be removed** 3 days after placement only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

- 3.9 **PROTECTION OF FORMED AND UNFORMED CONCRETE SURFACES.**
Protect concrete from damage or discoloration during the construction period caused by subsequent work performed by all other trades, including, but not limited to, concrete forming, resteel placement, equipment installation, plumbing work, electrical work, construction loading to the point of overstressing concrete, and all other actions which might adversely affect the strength or appearance of the concrete. Repair chipped or damaged concrete and remove rust, stains, efflorescence, and surface deposits by acceptable methods.

END OF SECTION

SECTION 081113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. Section includes hollow-metal work.
- B. Related Requirements:
 - 1. Section 08 71 00 "Door Hardware" for door hardware for hollow-metal doors.

1.03 QUALITY ASSURANCE

- A. Standards. Conform materials and workmanship with the following standards referenced herein:
 - 1. ANSI/SDI – American National Standards Institute - Steel Door Institute
 - 2. ASTM – American Society of Testing & Materials
 - 3. BHMA – Builders Hardware Manufacturers Association
 - 4. NAAMM-HMMA - National Association of Architectural Metal Manufacturers, Hollow Metal Manufacturers Association
 - 5. NFPA – National Fire Protection Association
 - 6. UL - Underwriters' Laboratories
- B. Definitions. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.
- C. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.04 SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.
- B. Shop Drawings: Include the following:
 - 1. Elevations of each door type.
 - 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
 - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 4. Locations of reinforcement and preparations for hardware.
 - 5. Details of each different wall opening condition.

6. Details of anchorages, joints, field splices, and connections.
 7. Details of accessories.
 8. Details of moldings, removable stops, and glazing.
- C. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.
- D. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.
- 1.05 DELIVERY, STORAGE, AND HANDLING
- A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch- (102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with the requirements, provide products by one of the following manufacturers:
1. Ceco Door.
 2. Curries Company.
 3. Mesker Door, Inc.
 4. Pioneer Industries.
 5. Republic Doors & Frames.
 6. Steelcraft.
- B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.02 REGULATORY REQUIREMENTS

- A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

2.03 INTERIOR DOORS AND FRAMES

- A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Heavy-Duty Doors and Frames: SDI A250.8, Level 2.

1. Physical Performance: Level B according to SDI A250.4.
2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches.
 - c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.042 inch.
 - d. Edge Construction: Model 2, Seamless.
 - e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.
3. Frames:
 - a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch.
 - b. Frames: Fabricated from same thickness material as adjacent door frame.
 - c. Construction: Face welded.
4. Exposed Finish: Prime.

2.04 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

- A. Construct exterior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3.
 1. Physical Performance: Level A according to SDI A250.4.
 2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches
 - c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A40 (ZF120) coating.
 - d. Edge Construction: Model 2, Seamless.
 - e. Core: Manufacturer's standard, polystyrene, polyurethane, or polyisocyanurate, at manufacturer's discretion.
 - 1) Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than 2.1 deg F x h x sq. ft./Btu (0.370 K x sq. m/W) when tested according to ASTM C1363.
 3. Frames:
 - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A40 (ZF120) coating.
 - b. Construction: Face welded.
 4. Exposed Finish: Prime.

2.05 FRAME ANCHORS

- A. Jamb Anchors:
 1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
- B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:
 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at finish floor surface.

2.06 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A879/A879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
 1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M, hot-dip galvanized according to ASTM A153/A153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A153/A153M.
- F. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- G. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.
- H. Glazing: Comply with requirements in Section 088000 "Glazing."

2.07 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
 1. Fire Door Cores: As required to provide fire-protection ratings indicated.
 2. Vertical Edges for Single-Acting Doors: Bevel edges 1/8 inch in 2 inches.
 3. Top Edge Closures: Close top edges of doors with inverted closures, except provide flush closures at exterior doors of same material as face sheets.
 4. Bottom Edge Closures: Close bottom edges of doors with end closures or channels of same material as face sheets.
 5. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.

- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 3. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 - 4. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
 - 3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
 - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - 5. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.
- E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
 - 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 - 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- F. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with mitered hairline joints.
 - 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
 - 2. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
 - 3. Provide loose stops and moldings on inside of hollow-metal work.

2.08 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 EXECUTION

3.01 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. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.03 INSTALLATION

- A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.
- B. Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, of size and profile indicated. Comply with SDI A250.11 or NAAMM HMMA 840 as required by standards specified.
 - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-rated openings, install frames according to NFPA 80.
 - b. Install door silencers in frames.
 - c. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - d. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 - 3. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

- d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Steel Doors:
 - a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.
 - c. At Bottom of Door: 5/8 inch plus or minus 1/32 inch.
 - d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.
 - 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.
 - 1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.04 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 081113

SECTION 083323
OVERHEAD COILING DOORS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. General. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.02 DESCRIPTION OF WORK

- A. Scope of Work. Provide the labor, tools, equipment, and materials necessary to furnish and install interior and exterior overhead coiling doors, track assemblies, operators, and accessories in accordance with the drawings and as specified herein.

1.03 QUALITY ASSURANCE

- A. Source Quality Control. Provide overhead coiling doors as complete units produced by a single manufacturer specializing in the production of this type of work, including hardware, accessories, mounting, and installation components.
- B. Codes and Regulatory Agencies. Perform all work in compliance with applicable federal, state, and local codes and regulatory agencies.
- C. Standards. All material and workmanship shall be in conformance with the following standards referenced herein.
 - 1. AA – Aluminum Association.
 - 2. ASTM – American Society for Testing and Materials.
 - 3. NEMA – National Electrical Manufacturers Association.
 - 4. NFPA – National Fire Protection Association.
 - 5. UL – Underwriters' Laboratories, Inc.
- D. Design Criteria. Design and reinforce coiling doors to withstand 20 pounds per square foot (psf) design wind load and be capable to operate under wind loading pressure of 10 psf for doors 144 sq feet or less and 7 psf for doors over 144 sf.

1.04 SUBMITTALS

- A. Product Data. Submit manufacturer's product data, roughing-in diagrams, and installation instructions for each type and size of overhead coiling door. Provide operating instructions and maintenance information, and complete information describing fire release system including electrical rough-in instructions.
- B. Shop Drawings. Submit shop drawings for special components and installations which are not fully dimensioned or detailed on manufacturer's data sheets. Provide setting drawings, templates, and directions for installation of anchorage devices.

- C. Label Certification. Submit UL certification for oversize fire rated doors and frames that each assembly has been constructed with materials and methods equivalent to requirements for labeled construction.
- D. Operation and Maintenance Manual. Submit overhead coiling door operation and maintenance (O&M) manual which contains O&M data on each type of door furnished.

1.05 JOB CONDITIONS

- A. Coordination. Coordinate all work with other trades. Verify openings and supports.
- B. Stain Protection. Protect surface of doors from stains, marks, or damage during construction.
- C. Inserts and Anchorages. Furnish inserts and anchoring devices which must be set in concrete or built into masonry for installation of units.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Delivery. Deliver all doors and frames in protective covers clearly noted as to mark number and location. Coordinate delivery with other work to avoid delays.
- B. Storage. Store all doors, frames, and accessories off the ground, covered and protected from the elements, and allow for the movement of air to prevent condensation.
- C. Handling. Keep all doors, frames, and accessories in original packages until ready to install or hang.

1.07 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of doors that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Door Curtain. Fabricate overhead coiling door curtain of interlocking slats designed to withstand required wind loading, of continuous length for width of door without splices. Unless otherwise indicated, provide reinforcing of slats, slats as recommended by door manufacturer for size and type of door to meet required wind loads.
 - 1. Face Slat. Provide 16-gauge minimum aluminum flat slat.
 - 2. Insulation. Education Center shall have minimum 3/4-inch-thick solid expanded polyurethane or polystyrene between face and back slats with a minimum R value of 8.0.
 - 3. Back Slat. Self-locking minimum 22 gauge aluminum flat slat completely encasing the insulation.
 - 4. Finish. All slats, unless noted otherwise, shall be Baked-Enamel or Powder-Coated Finish.
 - 5. Endlocks. Provide locks for curtain alignment and resistance against lateral movement.
 - 6. Windlocks. Provide high strength nylon or malleable iron secured to curtain slats with aluminum rivets. Provide windlocks on every slat on both edges of curtain.

7. Bottom Bar. Provide integral aluminum bottom bar, finished to match slats.
8. Vision Panels: Provide Approximately 10- by 1-5/8-inch (254- by 41-mm) openings spaced approximately 2 inches apart. Refer to drawings for layout. Installed standard vision-panel glazing.
9. Insulated Door Assembly Maximum U-Factor: 0.31 Btu/deg F x h x sq. ft.
10. Air Infiltration: Maximum rate of 0.4 cfm/sq. ft. (2.03 L/s per sq. m) at 15 and 25 mph (24.1 and 40.2 km/h) when tested according to ASTM E283 or DASMA 105.

B. Curtain Jamb Guides

1. Fabrication. Fabricate curtain jamb guides of steel angles or channels and angles with sufficient depth and strength to retain curtain loading. Build up units with minimum 3/16-inch thick steel sections, galvanized after fabrication. Slot bolt holes for track adjustment.
2. Anchorage. Secure continuous wall angle to wall framing by 3/8 inch minimum bolts at not more than 30 inches on center (o.c.), unless closer spacing recommended by door manufacturer. Extend wall angles above door opening head to support coil brackets, unless otherwise indicated. Place anchor bolts on exterior wall guides so they are concealed when door is in closed position. Provide removable stops on guides to prevent over travel of curtain, and continuous bar for holding windlocks.

C. Weather Seals

1. Weather Seals. Provide vinyl or neoprene weather stripping for exterior exposed doors, except where otherwise indicated. At door heads, use 1/8-inch-thick continuous sheet secured to inside of curtain coil hood. At door jambs, use 1/8-inch-thick continuous strip secured to exterior side of jamb guide.

D. Counterbalancing Mechanism

1. Torsion Spring. Counterbalance doors by means of adjustable steel helical torsion spring, mounted around a steel shaft and mounted in a spring barrel and connected to door curtain with required barrel rings. Use grease sealed bearings or self-lubricating graphite bearings for rotating members.
2. Counterbalance Barrel. Fabricate spring barrel of hot formed structural quality carbon steel, welded or seamless pipe, of sufficient diameter and wall thickness to support roll up of curtain without distortion of slats and limit barrel deflection to not more than 0.03 inch per foot of span and under full load.
 - a. Provide spring balance of one or more oil tempered, heat treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Provide cast steel barrel plugs to secure ends of springs to barrel and shaft.
 - b. Fabricate torsion rod for counterbalancing shaft of case hardened steel, of required size to hold fixed spring ends and carry torsional load.
3. Brackets. Provide mounting brackets of manufacturer's standard design, either cast iron or cold rolled steel plate with bell mouth guide groove for curtain.
4. Hood. Form to entirely enclose coiled curtain and operating mechanism at opening head, and act as weather seal. Contour to suit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Provide closed ends for surface mounted hoods, and any portion of between jamb mounting projecting beyond wall face. Provide intermediate support brackets as required to prevent sag.
 - a. Fabricate aluminum hoods for aluminum doors of Alloy 3003 aluminum sheet not less than 0.032-inch-thick, Baked-Enamel or Powder-Coated Finish.

- E. Colors: As selected by Architect from manufacturer's full range.
- F. Operation Cycles: Door components and operators capable of operating for not less than 20,000. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

2.02 MANUFACTURERS

- A. Manufacturer. Subject to compliance with requirements, provide products of one of the following:
 - 1. Atlas Door Corp.
 - 2. The Cookson Co.
 - 3. Cornell Innovative Door Solutions
 - 4. Hormann
 - 5. Raynor

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Site Verification of Conditions
 - 1. Verify all dimensions and quantities at the building and be responsible for same.
 - 2. Verify that all jambs are properly sized and drilled for specific hardware, anchors, tracks, and supports required by door installation.

3.02 INSTALLATION

- A. General. Install door and operating equipment complete with necessary hardware, jamb, and head mold strips, anchors, inserts, hangers, and equipment supports in accordance with final shop drawings, manufacturer's instructions, and as specified herein.

3.03 REPAIR/RESTORATION

- A. Damaged Work
 - 1. Remove from the site all doors and frames that are scratched, dented, stained, marred, or defaced that cannot be restored to original condition or to the satisfaction of the Owner and Engineer/Architect, and replace them at no additional cost to the Owner.

3.04 ADJUSTMENT

- A. Testing and Adjusting. Upon completion of installation including work by other trades, lubricate, test, and adjust doors to operate easily, free from warp, twist, or distortion and fitting weathertight for entire perimeter.

3.05 CLEANING.

- A. At the completion of the project, clean all doors as recommended by the manufacturer. Remove all field-applied protection and be responsible for any damage resulting from other cleaning methods. Do not use abrasive cleaning agents.

3.06 DEMONSTRATION

- A. Visual. Demonstrate that all doors operate freely, uniformly, and quietly without binding, twisting, or sagging, all hardware is functioning properly, and all doors are caulked and sealed as specified. Confirm that speed of travel is approximately 1 fps smoothly for total height of opening. Demonstrate safety device a minimum of five occurrences with some type of artificial obstruction or actual obstruction which could occur through normal use on this project.

3.07 PROTECTION.

- A. Protect all doors, frames, and exposed hardware from damage and/or staining during the progress of the project. Leave protective covering intact until Engineer/Architect requests removal or when the project is turned over to the Owner.

END OF SECTION 08 33 23

SECTION 087100
DOOR HARDWARE

PART 1 - GENERAL

1.01 1.1 DESCRIPTION

- A. A. Door hardware and related items necessary for complete installation and operation of doors.

1.2 RELATED WORK

- A. A. Caulking: Section 07 92 00 JOINT SEALANTS.
- B. B. Application of Hardware: // Section 08 11 13, HOLLOW METAL DOORS AND FRAMES.
- C. C. Painting: Section 09 91 13 & 09 91 23, INTERIOR & EXTERIOR PAINTING.

1.3 GENERAL

- A. A. All hardware shall comply with UFAS, (Uniform Federal Accessible Standards) unless specified otherwise.
- B. B. Provide rated door hardware assemblies where required by most current version of the International Building Code (IBC).
- C. C. Hardware for Labeled Fire Doors and Exit Doors: Conform to requirements of NFPA 80 for labeled fire doors and to NFPA 101 for exit doors, as well as to other requirements specified. Provide hardware listed by UL, except where heavier materials, large size, or better grades are specified herein under paragraph HARDWARE SETS. In lieu of UL labeling and listing, test reports from a nationally recognized testing agency may be submitted showing that hardware has been tested in accordance with UL test methods and that it conforms to NFPA requirements.
- D. D. Hardware for application on metal and wood doors and frames shall be made to standard templates. Furnish templates to the fabricator of these items in sufficient time so as not to delay the construction.
- E. E. The following items shall be of the same manufacturer, if possible, except as otherwise specified:
1. 1. Grade 1 Cylindrical locksets.
 2. 2. Hinges for hollow metal and wood doors.
 3. 3. Surface applied overhead door closers.
 4. 4. Exit devices.

1.4 WARRANTY

- A. A. Warranty period shall be two years for all items except as noted below:
1. 1. Locks, latchsets, and panic hardware: 5 years.
 2. 2. Door closers: 10 years.

1.5 MAINTENANCE MANUALS

- A. A. In accordance with Section 01 00 00, GENERAL REQUIREMENTS Article titled "INSTRUCTIONS", furnish maintenance manuals and instructions on all door hardware.

1.6 SUBMITTALS

- A. A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. Submit 6 copies of the schedule per Section 01 33 23.

- B. B. Hardware Schedule: Prepare and submit hardware schedule in the following form:

Hardware Item	Quantity	Size	Reference Publication Type No.	Finish	Mfr. Name and Catalog No.	Key Control Symbols	UL Mark (if fire rated and listed)	ANSI/BHMA Finish Designation

- C. C. Samples and Manufacturers' Literature:
1. 1. Samples: All hardware items (proposed for the project) that have not been previously approved by Builders Hardware Manufacturers Association shall be submitted for approval. Tag and mark all items with manufacturer's name, catalog number and project number.
 2. 2. Samples are not required for hardware listed in the specifications by manufacturer's catalog number, if the contractor proposes to use the manufacturer's product specified.
- D. D. Certificate of Compliance and Test Reports: Submit certificates that hardware conforms to the requirements specified herein. Certificates shall be accompanied by copies of reports as referenced. The testing shall have been conducted either in the manufacturer's plant and certified by an independent testing laboratory or conducted in an independent laboratory, within four years of submittal of reports for approval.

1.7 DELIVERY AND MARKING

- A. A. Deliver items of hardware to job site in their original containers, complete with necessary appurtenances including screws, keys, and instructions. Tag one of each different item of hardware and deliver to Architect for reference purposes. Tag shall identify items by Project Specification number and manufacturer's catalog number. These items shall remain on file in Architect's office until all other similar items have been installed in project, at which time the Architect will deliver items on file to Contractor for installation in predetermined locations on the project.

1.8 PREINSTALLATION MEETING

- A. A. Convene a preinstallation meeting not less than 30 days before start of installation of door hardware. Require attendance of parties directly affecting work of this section, including

Contractor and Installer, Architect, Hardware Consultant, and Hardware Manufacturer's Representative. Review the following:

1. 1. Inspection of door hardware.
2. 2. Job and surface readiness.
3. 3. Coordination with other work.
4. 4. Protection of hardware surfaces.
5. 5. Substrate surface protection.
6. 6. Installation.
7. 7. Adjusting.
8. 8. Repair.
9. 9. Field quality control.
10. 10. Cleaning.

1.9 INSTRUCTIONS

- A. A. Hardware Set Symbols on Drawings: Except for protective plates, door stops, mutes, thresholds and the like specified herein, hardware requirements for each door are indicated on drawings by symbols. Symbols for hardware sets consist of letters (e.g., "HW") followed by a number. Each number designates a set of hardware items applicable to a door type.
- B. B. Keying: All cylinders shall be keyed into existing Great Grand Master Key System. Provide removable cores that are removable only with a special key without disassembly of knob or lockset. Cores shall be 7 pin Interchangeable Core System to match existing. No substitutions will be allowed. Keying information will be furnished at a later date by the Owner/Architect.

1.10 APPLICABLE PUBLICATIONS

- A. A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only. In text, hardware items are referred to by series, types, etc., listed in such specifications and standards, except as otherwise specified.
- B. B. American Society for Testing and Materials (ASTM):
 1. F883-04 Padlocks
- C. C. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA):
 1. A156.1-06 Butts and Hinges
 2. A156.2-03 Bored and Pre-assembled Locks and Latches
 3. A156.3-08 Exit Devices, Coordinators, and Auto Flush Bolts
 4. A156.4-08 Door Controls (Closers)
 5. A156.5-01 Auxiliary Locks and Associated Products
 6. A156.6-05 Architectural Door Trim
 7. A156.8-05 Door Controls-Overhead Stops and Holders
 8. A156.12-05 Interconnected Locks and Latches
 9. A156.13-05 Mortise Locks and Latches Series 1000
 10. A156.14-07 Sliding and Folding Door Hardware
 11. A156.15-06 Release Devices-Closer Holder, Electromagnetic and Electromechanical
 12. A156.16-08 Auxiliary Hardware
 13. A156.17-04 Self-Closing Hinges and Pivots

14. A156.18-06 Materials and Finishes
 15. A156.20-06 Strap and Tee Hinges, and Hasps
 16. A156.21-09 Thresholds
 17. A156.22-05 Door Gasketing and Edge Seal Systems
 18. A156.23-04 Electromagnetic Locks
 19. A156.24-03 Delayed Egress Locking Systems
 20. A156.25-07 Electrified Locking Devices
 21. A156.26-06 Continuous Hinges
 22. A156.28-07 Master Keying Systems
 23. A156.29-07 Exit Locks and Alarms
 24. A156.30-03 High Security Cylinders
 25. A156.31-07 Electric Strikes and Frame Mounted Actuators
 26. A250.8-03 Standard Steel Doors and Frames
- D. D. National Fire Protection Association (NFPA):
1. 80-10 Fire Doors and Fire Windows
 2. 101-09 Life Safety Code
- E. E. Underwriters Laboratories, Inc. (UL):
- F. Building Materials Directory (2008)

PART 2 - PRODUCTS

11.01 2.1 BUTT HINGES

- A. A. ANSI A156.1. Provide only three-knuckle hinges. The following types of butt hinges shall be used for the types of doors listed, except where otherwise specified:
1. 1. Exterior Doors: Type A2112/A5112 for doors 900 mm 3 feet wide or less and Type A2111/A5111 for doors over 900 mm (3 feet) wide. Hinges for exterior outswing doors shall have non-removable pins. Hinges for exterior fire-rated doors shall be of stainless steel material.
 2. 2. Interior Doors: Type A8112/A5112 for doors 900 mm 3 feet wide or less and Type A8111/A5111 for doors over 900 mm (3 feet) wide. Hinges for doors exposed to high humidity areas (shower rooms, toilet rooms, kitchens, janitor rooms, etc. shall be of stainless steel material.
- B. B. Provide quantity and size of hinges per door leaf as follows:
1. Doors up to 1210 mm 4 feet high: 2 hinges.
 2. Doors 1210 mm 4 feet to 2260 mm (7 feet 5 inches high: 3 hinges minimum.
 3. Doors greater than 2260 mm 7 feet 5 inches high: 4 hinges.
 4. Doors up to 900 mm 3 feet wide, standard weight: 4.49 inch x 114 mm 4-1/2 inches x 4-1/2 inches) hinges.
 5. Doors over 900 mm 3 feet to 1065 mm (3 feet 6 inches wide, standard weight: 5 inch x 114 mm (5 inches x 4-1/2 inches.
 6. Doors over 1065 mm 3 feet 6 inches to 1210 mm (4 feet), heavy weight: 5 inch x 114 mm (5 inches x 4-1/2 inches.
 7. Provide heavy-weight hinges where specified.
 - a. At doors weighing 330 kg (150 lbs.) or more, furnish 127 mm 5 inch high hinges.

2.2 DOOR CLOSING DEVICES

A. CLOSING DEVICES SHALL BE PRODUCTS OF ONE MANUFACTURER.

2.3 OVERHEAD CLOSERS

- A. A. Conform to ANSI A156.4, Grade 1.
- B. B. Closers shall conform to the following:
 - 1. 1. The closer shall have minimum 50 percent adjustable closing force over minimum value for that closer and have adjustable hydraulic back check effective between 60 degrees and 85 degrees of door opening.
 - 2. 2. Where specified, closer shall have hold-open feature.
 - 3. 3. Size Requirements: Provide multi-size closers, sizes 1 through 6, except where multi-size closer is not available for the required application.
 - 4. 4. Material of closer body shall be forged or cast.
 - 5. 5. Arm and brackets for closers shall be steel, malleable iron or high strength ductile cast iron.
 - 6. 6. Where closers are exposed to the exterior or are mounted in rooms that experience high humidity, provide closer body and arm assembly of stainless steel material.
 - 7. 7. Closers shall have adjustable hydraulic back-check, separate valves for closing and latching speed, adjustable back-check positioning valve, and adjustable delayed action valve.
 - 8. 8. Provide closers with any accessories required for the mounting application, including (but not limited to) drop plates, special soffit plates, spacers for heavy-duty parallel arm fifth screws, bull-nose or other regular arm brackets, longer or shorter arm assemblies, and special factory templating. Provide special arms, drop plates, and templating as needed to allow mounting at doors with overhead stops and/or holders.
 - 9. 9. Closer arms or backcheck valve shall not be used to stop the door from overswing, except in applications where a separate wall, floor, or overhead stop cannot be used.
 - 10. 10. Provide parallel arm closers with heavy duty rigid arm.
 - 11. 11. Where closers are to be installed on the push side of the door, provide parallel arm type except where conditions require use of top jamb arm.
 - 12. 12. Provide all surface closers with the same body attachment screw pattern for ease of replacement and maintenance.
 - 13. 13. All closers shall have a 1 ½" (38mm) minimum piston diameter.

2.4 DOOR STOPS

- A. A. Conform to ANSI A156.16.
- B. B. Provide door stops wherever an opened door or any item of hardware thereon would strike a wall, column, equipment or other parts of building construction. For concrete, masonry or quarry tile construction, use lead expansion shields for mounting door stops.
- C. C. Where cylindrical locks with turn pieces or pushbuttons occur, equip wall bumpers Type L02251 (rubber pads having concave face) to receive turn piece or button.
- D. D. Provide floor stops (Type L02141 or L02161 in office areas; Type L02121 x 3 screws into floor elsewhere. Wall bumpers, where used, must be installed to impact the trim or the door

within the leading half of its width. Floor stops, where used, must be installed within 4-inches of the wall face and impact the door within the leading half of its width.

- E. E. Where drywall partitions occur, use floor stops, Type L02141 or L02161 in office areas, Type L02121 elsewhere.
- F. F. Provide stop Type L02011, as applicable for exterior doors. At outswing doors where stop can be installed in concrete, provide stop mated to concrete anchor set in 76mm (3-inch) core-drilled hole and filled with quick-setting cement.
- G. G. Omit stops where floor mounted door holders are required and where automatic operated doors occur.
- H. H. Provide appropriate roller bumper for each set of doors (except where closet doors occur) where two doors would interfere with each other in swinging.
- I. I. Provide appropriate door mounted stop on doors in individual toilets where floor or wall mounted stops cannot be used.
- J. J. Where the specified wall or floor stop cannot be used, provide concealed overhead stops (surface-mounted where concealed cannot be used).

2.5 OVERHEAD DOOR STOPS AND HOLDERS

- A. A. Conform to ANSI Standard A156.8. Overhead holders shall be of sizes recommended by holder manufacturer for each width of door. Set overhead holders for 110 degree opening, unless limited by building construction or equipment. Provide Grade 1 overhead concealed slide type: stop-only at rated doors and security doors, hold-open type with exposed hold-open on/off control at all other doors requiring overhead door stops.

2.6 LOCKS AND LATCHES

- A. A. Conform to ANSI A156.2. Locks and latches for doors 45 mm (1-3/4 inch thick or over shall have beveled fronts. Cylinders for all locksets shall be removable core type. Cylinders shall be furnished with construction removable cores and construction master keys. Cylinder shall be removable by special key or tool. Construct all cores so that they will be interchangeable into the core housings of all mortise locks, rim locks, cylindrical locks, and any other type lock included in the Great Grand Master Key System. Disassembly of lever or lockset shall not be required to remove core from lockset. All locksets or latches on double doors with fire label shall have latch bolt with 19 mm (3/4 inch) throw, unless shorter throw allowed by the door manufacturer's fire label. Provide temporary keying device or construction core of allow opening and closing during construction and prior to the installation of final cores.
- B. B. In addition to above requirements, locks and latches shall comply with following requirements:
 - 1. 1. Cylindrical Lock and Latch Sets: levers shall meet ADA (Americans with Disabilities Act) requirements. Cylindrical locksets shall be series 4000 Grade I. All locks and latchsets shall be furnished with 4.82 inch curved lip strike and wrought box. At outswing pairs with overlapping astragals, provide flat lip strip with 21mm (7/8-inch) lip-to-center dimension. Provide lever design to match design selected by Architect or to match existing lever design.

2.7 KEYS

- A. A. Stamp all keys with change number and key set symbol. Furnish keys in quantities as follows:

LOCKS/KEYS	QUANTITY
CYLINDER LOCKS	2 KEYS EACH
CYLINDER LOCK CHANGE KEY BLANKS	100 EACH DIFFERENT KEY WAY
MASTER-KEYED SETS	6 KEYS EACH
GRAND MASTER SETS	6 KEYS EACH
GREAT GRAND MASTER SET	5 KEYS
CONTROL KEY	2 KEYS

2.8 ARMOR PLATES, KICK PLATES, MOP PLATES AND DOOR EDGING

- A. A. Conform to ANSI Standard A156.6.
- B. B. Provide protective plates as specified below:
1. 1. Kick plates, mop plates and armor plates of metal, Type J100 series.
 2. 2. Provide kick plates and mop plates where specified. Kick plates shall be 254 mm 10 inches or 305 mm (12 inches) high. Mop plates shall be 152 mm (6 inches) high. Both kick and mop plates shall be minimum 1.27 mm (0.050 inches) thick. Provide kick and mop plates beveled on all 4 edges (B4E). On push side of doors where jamb stop extends to floor, make kick plates 38 mm (1-1/2 inches) less than width of door, except pairs of metal doors which shall have plates 25 mm (1 inch) less than width of each door. Extend all other kick and mop plates to within 6 mm (1/4 inch) of each edge of doors. Kick and mop plates shall butt astragals. For jamb stop requirements, see specification sections pertaining to door frames.
 3. 3. Kick plates and/or mop plates are not required on following door sides:
 - a. a. Armor plate side of doors;
 - b. b. Exterior side of exterior doors;
 - c. c. Closet side of closet doors;

2.9 EXIT DEVICES

- A. A. Conform to ANSI Standard A156.3. Exit devices shall be Grade 1; type and function are specified in hardware sets. Provide flush with finished floor strikes for vertical rod exit devices in interior of building. Trim shall have cast satin stainless steel lever handles of design similar to locksets, unless otherwise specified. Provide key cylinders for keyed operating trim and, where specified, cylinder dogging.
- B. B. Concealed vertical rod panics shall be provided less bottom rod at interior doors, unless lockable or otherwise specified; provide fire pins as required by exit device and door fire labels. Where concealed vertical rod panics are specified at exterior doors, provide with both top and bottom rods.
- C. C. At non-rated openings with panic hardware, provide panic hardware with key cylinder dogging feature.
- D. D. Exit devices for fire doors shall comply with Underwriters Laboratories, Inc., requirements for Fire Exit Hardware. Submit proof of compliance.

2.10 DOOR PULLS

- A. A. Conform to ANSI A156.6. Pull plate 3.54 inch by 350 mm (3-1/2 inches by 14 inches), unless otherwise specified. Cut plates of door pulls for cylinders, or turn pieces where required.

2.11 PUSH PLATES

- A. A. Conform to ANSI A156.6. Metal, Type J302, 200 mm 8 inches wide by 350 mm (14 inches) high, unless otherwise specified. Provide metal Type J300 plates 3.94 inch (4 inches wide by 350 mm (14 inches) high) where push plates are specified for doors with stiles less than 200 mm (8 inches) wide. Cut plates for cylinders, and turn pieces where required.

2.12 THRESHOLDS

- A. A. Conform to ANSI A156.21, mill finish extruded aluminum, except as otherwise specified. In existing construction, thresholds shall be installed in a bed of sealant with 1/4-20 stainless steel machine screws and expansion shields. In new construction, embed aluminum anchors coated with epoxy in concrete to secure thresholds. Furnish thresholds for the full width of the openings.
- B. B. For thresholds at elevators entrances see other sections of specifications.
- C. C. At exterior doors and any interior doors exposed to moisture, provide threshold with non-slip abrasive finish.
- D. D. Provide with miter returns where threshold extends more than 12 mm 0.5 inch from frame face.

2.13 WEATHERSTRIPS (FOR EXTERIOR DOORS)

- A. A. Conform to ANSI A156.22. Air leakage shall not to exceed 0.50 CFM per foot of crack length (0.000774m³/s/m).

2.14 MISCELLANEOUS HARDWARE

- A. A. Mutes: Conform to ANSI A156.16. Provide door mutes or door silencers Type L03011 or L03021, depending on frame material, of white or light gray color, on each steel or wood door frame, except at fire-rated frames, lead-lined frames and frames for sound-resistant, lightproof and electromagnetically shielded doors. Furnish 3 mutes for single doors and 2 mutes for each pair of doors, except double-acting doors. Provide 4 mutes or silencers for frames for each Dutch type door. Provide 2 mutes for each edge of sliding door which would contact door frame.

2.15 FINISHES

- A. A. Exposed surfaces of hardware shall have ANSI A156.18, finishes as specified below. Finishes on all hinges, pivots, closers, thresholds, etc., shall be as specified below under "Miscellaneous Finishes." For field painting (final coat) of ferrous hardware, see Section 09 91 00, PAINTING.

- B. B. 626 or 630: All surfaces on exterior and interior of buildings, except where other finishes are specified.
- C. C. Miscellaneous Finishes:
1. 1. Hinges --exterior doors: 626 or 630.
 2. 2. Hinges --interior doors: 652 or 630.
 3. 3. Door Closers: Factory applied paint finish. Dull or Satin Aluminum color.
 4. 4. Thresholds: Mill finish aluminum.

2.16 BASE METALS

- A. A. Apply specified U.S. Standard finishes on different base metals as following:

Finish	Base Metal
652	Steel
626	Brass or bronze
630	Stainless steel

PART 3 - EXECUTION

28.01 3.1 HARDWARE HEIGHTS

- A. A. For existing buildings locate hardware on doors at heights to match existing hardware. The Contractor shall visit the site, verify location of existing hardware and submit locations to Owner/Architect for approval.
- B. B. Hardware Heights from Finished Floor:
1. 1. Exit devices centerline of strike (where applicable) 1024 mm (40-5/16 inches).
 2. 2. Locksets and latch sets centerline of strike 1024 mm (40-5/16 inches).
 3. 3. Deadlocks centerline of strike 1219 mm 48 inches.
 4. 4. Centerline of door pulls to be 1016 mm 40 inches.
 5. 5. Push plates and push-pull shall be 1270 mm 50 inches to top of plate.
 6. 6. Push-pull latch to be 1024 mm (40-5/16 inches to centerline of strike).
 7. 7. Locate other hardware at standard commercial heights. Locate push and pull plates to prevent conflict with other hardware.

3.2 INSTALLATION

- A. A. Closer devices, including those with hold-open features, shall be equipped and mounted to provide maximum door opening permitted by building construction or equipment. Closers shall be mounted on side of door inside rooms, inside stairs, and away from corridors // except security bedroom, bathroom and anteroom doors which shall have closer installed parallel arm on exterior side of doors. //. At exterior doors, closers shall be mounted on interior side. Where closers are mounted on doors they shall be mounted with sex nuts and bolts; foot shall be fastened to frame with machine screws.

- B. B. Hinge Size Requirements:

DOOR THICKNESS	DOOR WIDTH	HINGE HEIGHT
45 MM 1-3/4 INCH	900 MM (3 FEET) AND LESS	113 MM (4-1/2 INCHES)

45 MM (1-3/4 INCH)	OVER 900 MM (3 FEET) BUT NOT MORE THAN 1200 MM (4 FEET)	125 MM (5 INCHES)
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C. C. Hinges Required Per Door:

Doors 1500 mm (5 ft) or less in height	2 butts
Doors over 1500 mm (5 ft) high and not over 2280 mm (7 ft 6 in) high	3 butts
Doors over 2280 mm 7 feet 6 inches) high	4 butts

- D. D. Fastenings: Suitable size and type and shall harmonize with hardware as to material and finish. Provide machine screws and lead expansion shields to secure hardware to concrete, ceramic or quarry floor tile, or solid masonry. Fiber or rawl plugs and adhesives are not permitted. All fastenings exposed to weather shall be of nonferrous metal.

3.3 FINAL INSPECTION

- A. A. Installer to provide letter to Owner/Architect that upon completion, installer has visited the Project and has accomplished the following:
1. 1. Re-adjust hardware.
 2. 2. Evaluate maintenance procedures and recommend changes or additions, and instruct ODNr personnel.
 3. 3. Identify items that have deteriorated or failed.
 4. 4. Submit written report identifying problems.

3.4 DEMONSTRATION

- A. A. Demonstrate efficacy of mechanical hardware and electrical, and electronic hardware systems, including adjustment and maintenance procedures, to satisfaction of ODNr personnel.

3.5 HARDWARE SETS

- A. HW-1
1. Single Exterior, Corridor Entry, Exterior From MAINTENANCE BUILDING
 2. 3 Hinges A5112 4.5 x 4.5 NRP 630
 3. 1 Exit Device Type 1 function 08 630
 4. 1 Cylinder 12E72 626
 5. 1 Closer C02021 PT4C PT4D PT4G 689
 6. 1 Kickplate J102 8" x 2" less door width 630
 7. 1 Threshold J32100 719
 8. 1 Gasketing Set R3C165 628
 9. 1 Sweep R3C435 628

END OF SECTION 087100

SECTION 133400
ENGINEERED POST FRAME STRUCTURES

PART 1 – GENERAL

1.01 REFERENCE STANDARDS

- A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
- B. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
- C. ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
- D. AWWA U1 - Use Category System: User Specification for Treated Wood.

1.02 RELATED DOCUMENTS

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

1.03 DESCRIPTION OF WORK

- A. Section Includes:
 - 1. Engineered wood-framed structures consisting of the following components:
 - a. Factory-engineered wall columns.
 - b. Factory-engineered roof truss.
 - c. Factory-engineered metal roof and wall panels.
 - d. Prefinished metal trim items.
 - e. Prefinished ridge vents
 - 1) Related Requirements:
 - f. Section 08 11 13 "Hollow Metal Doors and Frames" for doors and frames.
 - g. Section 08 33 13 "Sectional Doors" for exterior overhead coiling door.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer with minimum 5 years' documented experience that participates in recognized quality-assurance program that complies with quality-control procedures and that involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction.
 - 1. Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility.
 - 2. Manufacturer shall have engineering department.
 - 3. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by qualified professional engineer.

- B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.
- C. Source Limitations: Obtain engineered post frame building components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer.

1.05 SUBMITTALS

- A. Product Data: For each type of process and factory-engineered product. Indicate component materials, dimensions, profiles, and construction and installation details.
 - 1. Include information for specialty accessory products specified for this Project.
 - 2. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 3. For products receiving waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to truss fabricator.
 - 4. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Sizes, stress grades, and species of lumber.
 - 2. Anchor-bolt layout.
 - 3. Structural Framing Drawings: Show complete fabrication of primary and secondary framing. Include provisions for openings and the following information:
 - a. Slope or depth, span, and spacing of truss.
 - b. Heel bearing height.
 - c. Design loading to include:
 - 1) Top chord live load.
 - 2) Top chord dead load.
 - 3) Bottom chord dead load.
 - 4) Concentrated loads and their points.
 - d. Adjustments to lumber and plate design values for conditions of use.
 - e. Plate type, thickness of gauge, and size.
 - f. Lumber size, species and grade for each member.
 - 4. Metal Roof and Wall Panel Layout Drawings: Show layouts of metal panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, trim, flashings, gutters, downspouts, closures, and special details. Indicate the following components:
 - a. Roof mounted items.
 - b. Wall mounted items.
 - 5. Submit Shop Drawings that have been engineered and certified by professional engineer licensed in the State in which Project is located. Include seal and signature of professional engineer on Shop Drawings.
- C. Design Data: Truss engineering calculations for loading and stresses, bearing seal and signature of professional engineer licensed in the State in which Project is located. Include the following calculations:
 - 1. Minimum design shall meet design standards of latest edition of International Building Code unless other, more stringent requirements are in force in Project location.

2. Bending moments and axial forces for each member.
 3. Basic plate design values.
 4. Design analysis for each joint indicating that proper plates have been used.
 5. Provide design calculations for exterior walls, canopies, soffit systems, and lateral bracing walls. Design wind loads and lateral bracing loads are indicated on structural Drawings.
 6. Submit design calculations that have been engineered and certified by professional engineer licensed in the State in which Project is located. Include seal and signature of professional engineer on calculations
- D. Samples for Initial Selection: For units with factory-applied color finish, color chart of manufacturer's standard colors.
- E. Evaluation Reports: For the following, from ICC-ES:
1. Wood-preservative-treated wood.
 2. Engineered wood products.
- F. Quality Control Submittals:
1. Test Reports: Certified test reports showing compliance with specified performance characteristics.
 2. Certification: Manufacturer's certification that Products furnished meet specified design and performance criteria.
- G. Submit written proof of third party inspection program in force for truss manufacturer used on Project.
- H. Certifications: Certify that specified roof and wind load requirements are met.
- 1.06 DELIVERY, STORAGE, AND HANDLING
- A. Handle and store materials per manufacturer's requirements.
- B. Handle and store trusses to comply with recommendations in TPI BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."
1. Store trusses flat, off of ground, and adequately supported to prevent lateral bending.
 2. Protect trusses from weather by covering with waterproof sheeting, securely anchored.
 3. Provide for air circulation around stacks and under coverings.
 4. Store trusses to avoid contact with other materials that could create staining or discoloration.
- C. Inspect trusses upon deliver to Project site and notify manufacturer immediately if members have damage from handling or show discoloration, corrosion, or other evidence of deterioration. Discard and replace trusses that are damaged or defective.
- 1.07 WARRANTY
- A. Manufacturer's Special Warranty – Treated Material: Manufacturer agrees to repair, restore, or replace columns that fail in materials within specified warranty period.
1. Warranty Period: 50 years from date of Substantial Completion.

2. Manufacturer shall repair treated structural columns that fail because of insect damage or because of decay that occurs under normal conditions and proper use. If manufacturer is not able to repair structural posts to satisfaction of Architect and Owner, manufacturer shall replace damaged treated structural columns.
- B. Special Warranty on Metal Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
1. Exposed Panel Finish: Deterioration includes the following:
 - a. Color fading more than 5 Hunter units when tested per ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested per ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 2. Finish Warranty Period: From date of Substantial Completion, 40 years on chalk, chipping or peeling; 30 years on color change:
 3. Warranty Exclusions: Manufacturer will not warrant metal panel finishes damaged due to exposure to atmospheric pollutants including animal waste or other corrosive conditions. Manufacturer will not warrant labor by others.
 4. Manufacturer shall repair painted steel roofing or siding panels if the paint peels, cracks, checks, flakes or blisters to an extent that is apparent by ordinary outdoor visual observation when exposed to normal weather and atmospheric conditions. If manufacturer is not able to repair steel panels to satisfaction of Architect and Owner, manufacturer shall replace damaged steel panels.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements, provide products by one of the following manufacturers:
1. Energy Panel Structures, Inc.
 2. MQS Structures, LLC
 3. Kirkham Building System, Inc.

2.02 PERFORMANCE CRITERIA

- A. Design Requirements:
1. Design wood members per formulas published in National Design Specifications (NDS) for Wood Construction.
 2. Design light meta-toothed connector plates and joint design in compliance with Truss Plate Institute's (TPI) National Design Standard for Metal Plate Connected Wood Truss Construction.
 3. Include unbalanced roof loads required by ASCE 7, current edition recognized by the building code.

2.03 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
 2. For exposed items indicated to receive stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Maximum moisture content of 19 percent or per appropriate grading rules. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of inspection agency approved by ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
1. Laminated columns.
 2. Baseboards.
 3. Hold down blocks.

2.04 MATERIALS – WOOD

- A. Laminated Columns: Factory-fabricated from minimum 3 ply 2 inch by 6 inch #1 or better southern yellow pine.
1. Columns to 20 Feet Lengths: Full-length (unspliced) nail laminated plies. Provide middle ply with short truss support block.
 2. Columns over 20 Feet Lengths: Spliced laminated plies per approved Shop Drawings and manufacturer's design.
 3. Preservative-Treatment: Treat portions of columns designed to be in contact with ground to net retention of 0.60 pounds per cubic foot of CCA per AWP A U1 requirements.
- B. Wood Trusses: Factory-fabricated of surfaced lumber.
1. Lumber:
 - a. Top and Bottoms Chords: No. 1 or better Southern yellow pine or comparable Spruce- pine-fir.
 - b. Webs: No. 2 or better Southern yellow pine or SPF.
 2. Metal Connector Plates: Fabricated from ASTM A653; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A); G60 hot-dip galvanizing coating designation.
 - a. Plate Thicknesses: 0.036 inch and 0.0556 inch thick.
- C. Baseboards: 2 inch by 8 inch No. 2 or better Southern yellow pine, tongue-and-groove.
1. Preservative-Treatment: Treat baseboards for ground contact conditions. per AWP A U1 requirements. Preservative shall penetrate 100 percent of sapwood.
- D. Wall Girts: 2 inch by 6 inch girts, No. 1 or better Southern yellow pine.
- E. Purlins and Truss Ties: 2 inch by 4 inch laid on edge, MSR SPF 1650.
1. Purlins may be installed over top chord of truss, flat, or in purlin hangers. Where purlins and truss ties are set in hangers, provide 2 inch by 6 inch laid on edge, MSR SPF 1650 or No. 1 or better Southern yellow pine.
- F. Overhang Framing: Fabricated rafter frames.
1. Provide factory beveled fascia boards, 2 inch by 6 inch Spruce-pine-fir, No. 2.

- G. Wind Bracing:
 - 1. 2 inch by 6 inch, No. 2 or better Spruce-pine-fir from end wall column to first truss back.
 - 2. 2 inch by 4 inch diagonal in roofline bracing as required by design.
- H. Framing Around Openings:
 - 1. Provide 2 inch by 6 inch/2 inch by 4 inch No. 2 around door, window, and overhead sectional door openings.
- I. Headers: Provide built-up No. 1 or better Southern yellow pine headers as required to meet loading designs.
- J. Incidental Framing: No.2 or better 2 inch by 4 inch.

2.05 MATERIALS – PREFINISHED MATERIALS

- A. General: Factory-formed metal panels, roll-formed in manufacturer's facility, designed to be field assembled by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps. Include accessories required for weathertight installation.
- B. Metal Panels: Exposed-fastener metal roof and wall panels, formed with raised ribs and recesses.
 - 1. Material: Zinc-coated (galvanized) steel sheet, 29 ga (0.0135) inch nominal thickness.
 - a. Exterior Finish: Siliconized polyester.
 - b. Color: Selected by Architect from manufacturer's full range.
 - 2. Rib Spacing: 2 major ribs at 9 inches on center. 2 minor ribs at 3 inches on center between major ribs.
 - 3. Panel Coverage: 36 inches.
 - 4. Panel Height: 3/4 inch.
- C. Metal Trim: Match material and color of metal panels. Provide trim for corners, ridge lines, rakes, eaves, and panel bases.
 - 1. Lengths: Minimum 10 feet.
 - 2. Trim, overhang facias, track covers, and slide door jambs available in building panel covers.
 - 3. Overhead Door and Slide Door Jamb Trim: Fabricated from 1 piece up to 10 feet in length.
- D. Ridge Vent: Manufacturer's standard pre-engineered ridge cap or ridgelite, flashings, and eave and gable trim. Field-fabricate minor flashings as indicated on approved Shop Drawings.
 - 1. Provide manufacturer's standard ridge vents as indicated on Drawings
 - 2. Continuous Vented Ridge 12 square inches per lineal foot
- E. Gutters: Zinc-coated (galvanized) 0.018-inch (0.46-mm) nominal uncoated steel thickness, prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- (2438-mm-) long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."
 - 1. Gutter Supports: Fabricated from same material and finish as gutters.
 - 2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.

- F. Downspouts: Zinc-coated (galvanized) 0.018-inch (0.46-mm) nominal uncoated steel thickness, prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot- (3-m-) long sections, complete with formed elbows and offsets.
 - 1. Mounting Straps: Fabricated from same material and finish as gutters.

2.06 RELATED MATERIALS

- A. Closure Strips: Closed cell, 2 psf density polyethylene foam, premolded to match configuration of panels.

2.07 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
 - 1. Where trusses are exposed to weather, in ground contact, made from pressure-preservative treated wood, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153.
 - 2. Exposed Fastener Heads: Match color of steel panel.
 - 3. Where steel panels or trim is attached to preservative-treated lumber, provide fasteners of unpainted Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F1667.
 - 1. Framing Lumber: 10d, 16d and 60d ring shank nails.
 - 2. Machine Bolts: Minimum grade 1, A307.
 - 3. Metal Panels: Minimum 1-1/2 inch No. 10 screw fasteners with EPDM sealing washers bearing on weather side of metal panels.
 - a. Match color of metal panels.

2.08 FABRICATION

- A. Shop-fabricate wood trusses in TPI inspected plant.
- B. Cut truss members to accurate lengths, angles, and sizes to produce close-fitting joints.
- C. Fabricate metal connector plates to sizes, configurations, thicknesses, and anchorage details required to withstand design loads for types of joint designs indicated.
- D. Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly with joints closely fitted to comply with tolerances in TPI.
 - 1. Position members to produce design camber indicated.
 - 1. Fabricate wood trusses within manufacturing tolerances in TPI 1.
- E. Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.
- C. Verify that mechanical and electrical utilities are in correct position.

3.02 ERECTION OF FRAMING

- A. General: Do not use materials that are unsound, warped, improperly finished, or with defective surfaces, sizes, or patterns.
 - 1. Comply with frame manufacturer's approved Shop Drawings for details and building erection.
 - 2. Comply with NFBA document "Accepted Practices for Post-frame Construction Framing Tolerances."
- B. Columns:
- C. Auger hole to depth of diameter indicated on Drawings.

END OF SECTION 133400