PROJECT MANUAL FOR:

Columbia Public Schools
Roseta Avenue Learning Center Accessibility, Safety and Security Improvements
Columbia, Missouri

Prepared by:

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PWA No.: 201621.51
RFP # 21/35
December 17, 2020

CERTIFICATION PAGE

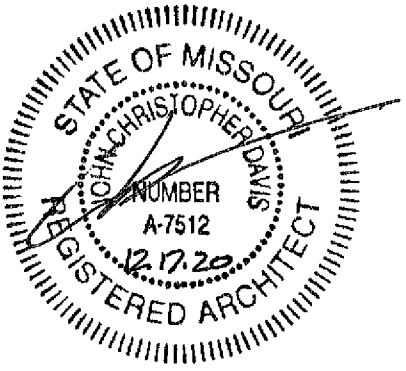
Project Title **Columbia Public Schools**
Roseta Avenue Learning Center Accessibility, Safety and Security Improvements
Columbia, Missouri
PWA # **201621.51**

The following drawings and specifications have been prepared by me or under my direct supervision:

Drawings:

ARCHITECTURE

G001	COVER SHEET
G002	BUILDING OCCUPANCY AND EGRESS PLAN
A101	PLANS AND SCHEDULES
A102	ELEVATIONS AND DETAILS
A103	SECTIONS AND DETAILS



Specifications:

01 10 00	Summary
01 20 00	Price and Payment Procedures
01 30 00	Administrative Requirements
01 32 16	Construction Progress Schedule
01 40 00	Quality Requirements
01 50 00	Temporary Facilities and Controls
01 60 00	Product Requirements
01 70 00	Execution and Closeout Requirements
01 78 00	Closeout Submittals
02 41 00	Demolition
04 20 00	Unit Masonry
05 50 00	Metal Fabrications
06 41 00	Architectural Wood Casework
07 92 00	Joint Sealants
08 11 13	Hollow Metal Frames and Doors
08 14 16	Flush Wood Doors
08 32 50	Bullet Resistant Security Aluminum Windows, Doors, and Frames
08 43 13	Aluminum Framed Storefronts
08 71 00	Door Hardware and Schedule
08 71 13	Automatic Door Operators
08 80 00	Glazing
09 21 16	Gypsum Board Assemblies
09 65 00	Resilient Flooring
09 90 00	Painting and Coating
10 11 01	Visual Display Boards
10 14 00	Signage
10 75 00	Flagpoles
11 66 23	Athletic Equipment

Name and license: J. Christopher Davis #A-7512

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Roseta Avenue Learning Center Accessibility, Safety and Security Improvements
Columbia, Missouri

PWA # **201621.51**

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Drawings:

C0.01	Cover Sheet
C0.02	General Notes
C1.01	Demolition Plan
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Specifications:

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32 92 00 Appendix A Hydramax

Other Documents
Storm Water Pollution Prevention Plan

12/17/20

STATE OF MISSOURI
ZACHARY
KARIS THOMAS
NUMBER
PE-2004017256
PROFESSIONAL ENGINEER

Name and license: Zachary Karis Thomas - MO #PE 2004017256

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Roseta Avenue Learning Center Accessibility, Safety and Security Improvements
Columbia, Missouri

PWA # **201621.51**

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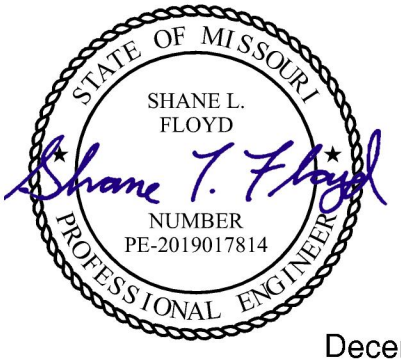
Drawings:

MECHANICAL, ELECTRICAL & PLUMBING

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MEP2	SITE UTILITIES PLAN
MEP2.1	SITE UTILITES DETAILS AND SCHEDULES
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265219	EMERGENCY AND EXIT LIGHTING
265613	LIGHTING POLES AND STANDARDS
265619	LED EXTERIOR LIGHTING



December 17th, 2020

Name and license: Shane Floyd # PE-2019017814

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Roseta Avenue Learning Center Accessibility, Safety and Security Improvements
Columbia, Missouri
Project No.: 201621.51

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1.01 General

A. The Drawings referred to and accompanying this Project Manual and Specifications consist of the following sheets:

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G002	BUILDING OCCUPANCY AND EGRESS PLAN

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C0.01	COVER SHEET
C0.02	GENERAL NOTES
V1.01	BOUNDARY & TOPOGRAPHIC SURVEY
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C9.01-C9.02	STORM SEWER DETAILS
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C11.01	STORM SEWER DRAINAGE AREA MAP
L1.01-L1.02	LANDSCAPE PLAN

ARCHITECTURAL

A101	PLANS AND SCHEDULES
A102	ELEVATIONS AND DETAILS
A103	SECTIONS AND DETAILS

MECHANICAL, ELECTRICAL & PLUMBING

MEP1	MECHANICAL ELECTRICAL PLUMBING COVER SHEET
MEP2	SITE UTILITIES PLAN
MEP2.1	SITE UTILITIES DETAILS AND SCHEDULES
MEP3	SITE PHOTMETRIC PLAN
EP100	POWER PLAN
EL100	LIGHTING PLAN

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NOTICE TO BIDDERS

Sealed bids for a Stipulated Sum Contract will be received by Columbia Public School District, Administrative Offices, 1818 W. Worley, Columbia, Missouri, 65203, until 2:00 pm on Tuesday January 19th, 2021, for the following work:
Roseta Accessibility, Security and Safety Improvements
Columbia Public Schools, Columbia, Missouri
PWA Project No. 201621.51

General description of Work:
Demolition work generally consists of removal of existing doors, walls, glass storefronts, door hardware, selective paving and additional items as described further in the demolition specification and drawings.

Construction work generally consists of new walls, doors, storefront, security doors, finishes, casework, exterior paving, related mechanical / electrical / plumbing work and additional items as described further in the specifications and drawings.

The Bids will be opened publicly at the Columbia Public School District Administrative Offices, 1818 West Worley, Columbia, Missouri 65203.

Contract Documents and other related contract information may be obtained at ADS, 1400 Forum Boulevard, Suite 7A, Columbia, Missouri 65203, telephone (573) 446-7768. Refundable deposit sets are available for $200.00 each set, in the form of a certified or cashier's check made payable to "Columbia Public Schools". Mailing cost will be C.O.D. Deposits will be refunded upon the Postage Paid return of the Documents in good condition within Ten (10) days following receipts of Bids. Electronic Bid Sets are available at no cost. You may fax your request for a "Searchable CD-ROM", or view online at www.adsmo.net . The page offers links to "online Plans and Specs" and the "Plan Holders' List". Your firm will be placed on the "Plan Holders' List" only when a paper set of documents are ordered. Contract Documents will be on file at CPS Building Services and at the offices of PWArchitects, Inc. and ADS as well as the following Plan Rooms:

ePlan Online Planroom, 503 E. Nifong Boulevard, Suite H, Box 346, Columbia, MO 65201
Builders Association of Missouri, 3632 West Truman Blvd., Jefferson City, MO 65109
Minority Contractors Association, 3200 Wayne Avenue, Suite 202, Kansas City, MO 64109

The Owner reserves the right to reject any and all Bids and to waive all informalities in Bids. No Bid may be withdrawn for a period of 60 days subsequent to the specified time for receipt of Bids.

A **MANDATORY** pre-bid conference for **GENERAL CONTRACTORS** will be held on **Monday, January 4th, 2021**, at 10:00 am at Roseta, 1100 S. Roseta, Columbia, Missouri 65201. All other bidders / subcontractors / suppliers interested in this project are encouraged to attend as well.

All Requests for Clarification (RFC) and Requests for Substitutions (RFS) need to be received four (4) working days prior to the bid. All request forms need to be complete and valid prior to forwarding them to the Engineer for review and consideration. All responses shall be included in an Addendum that will be made available to all planholders. RFC and RFS form are included in the bidding documents; an electronic version will be available on the ADS website.

Questions pertaining to the Project should be directed to Chris Davis, AIA; PWArchitects, Inc., 2120 Forum Blvd., Ste. 101, Columbia, Missouri 65203; Telephone: (573) 449-2683 Fax: (573) 442-6213. E-mail cdavis@pwarchitects.com

OWNER: Columbia Public School District
Columbia, Missouri 65203

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Instructions to Bidders

for the following Project:
(Name, location, and detailed description)

CPS Roseta Avenue Learning Center Accessibility, Safety and Security Improvements
Columbia, Missouri

THE OWNER:
(Name, legal status, address, and other information)

Columbia Public Schools
1818 West Worley
Columbia, Missouri 65203
Telephone Number: (573) 214-3416
Fax Number: (573) 214-3417

THE ARCHITECT:
(Name, legal status, address, and other information)

Peckham & Wright Architects, Inc.
d/b/a "PWArchitects, Inc." "PWA"
2120 Forum Boulevard, Suite 101
Columbia, Missouri 65203
Telephone Number: (573) 449-2683
Fax Number: (573) 442-6213

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™–2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.

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2 BIDDER'S REPRESENTATIONS

3 BIDDING DOCUMENTS

4 BIDDING PROCEDURES

5 CONSIDERATION OF BIDS

6 POST-BID INFORMATION

7 PERFORMANCE BOND AND PAYMENT BOND

8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

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User Notes: (3B9ADA41)

ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

- **.1** the Bidder has read and understands the Bidding Documents;
- **.2** the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- **.3** the Bid complies with the Bidding Documents;
- **.4** the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- **.5** the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- **.6** the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.
(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)

§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper

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documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

§ 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids.
(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3 Substitutions

§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

§ 3.3.2 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

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§ 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:

(Insert the form and amount of bid security.)

§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

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§ 4.2.3 If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning days after the opening of Bids, withdraw its Bid and request the return of its bid security.

§ 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:
(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)

§ 4.3.2 Paper copies of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address, and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.3 Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:
(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 Opening of Bids

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

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§ 5.2 Rejection of Bids
Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

§ 5.3 Acceptance of Bid (Award)
§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

§ 5.3.2 Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 Contractor's Qualification Statement
Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.

§ 6.2 Owner's Financial Capability
A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. The Owner shall then furnish such reasonable evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 Submittals
§ 6.3.1 After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

.1 a designation of the Work to be performed with the Bidder's own forces;
.2 names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
.3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 Bond Requirements
§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

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§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.
(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)

§ 7.2 Time of Delivery and Form of Bonds
§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS
§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

.3 AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

.4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
(Insert the date of the E203-2013.)

.5 Drawings

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Number	Title	Date

.6 Specifications

Section	Title	Date	Pages

.7 Addenda:

Number	Date	Pages

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[ ] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017.)

[ ] The Sustainability Plan:

Title	Date	Pages

[ ] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents listed below:
(List here any additional documents that are intended to form part of the Proposed Contract Documents.)

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SECTION 00 22 14

SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

GENERAL

1.01 SITE VISIT

A. All visits to the site shall be made with: Mr. Charles Oestreich, Director of Facilities, (573) 214-3760.

1.02 WAGE RATES AND LABOR STANDARDS

A. The Contractor shall pay not less than the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed, as determined by the Missouri Department of Labor and Industrial Relations and is attached to this Project Manual.

1.03 BUILDING PERMIT REQUIREMENTS

A. The Bidder is responsible for payment of the County required permits. The amount we've been given is $907.50. This is for the general permit only. The Bidder shall confirm this prior to submitting their bids. The Contractor shall be solely responsible for obtaining all other necessary building permits, licenses and other documents to perform this work. All work under this Agreement shall be done by Contractor in compliance with all applicable local, county, state and federal laws, codes, ordinances and regulations.

1.04 ADDENDA

A. Change 3.4.3 to read "Addenda will be issued no later than forty-eight hours prior to the date for receipt of Bids…".

B. All questions and substitution requests shall be in writing and on the forms included with the Bid Documents. The deadline for these items is four (4) working days before the bid opening.

1.05 BID BOND

A. Add the following to 4.2.1

The Bid Bond shall be 5% of the value of construction. For purposes of bidding the construction budget is $500,000.00.

1.06 BID PROPOSALS SHALL CONTAIN

A. All bids shall contain a signed proposal form, properly executed bid bond, PW-2 form filled out in its entirety and other AIA and Contract documents accompanying the set of Bid Documents and Specifications.

1.07 SCHEDULING

A. Timing from Spec Section 00 72 01 Article 8: Time -

8.1.3.1 Work may begin on site once school is out for Summer which is approximately June 1, 2021. The Contractor may have access to the facility for field work when students are not present in the building. The Contractor shall achieve Substantial Completion and occupancy permit by August 1, 2021, and Final Completion by August 15, 2021.

END OF SECTION

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REQUEST FOR CLARIFICATION (RFC)

Project Title: Columbia Public Schools: Roseta Avenue Learning Center Accessibility, Safety and Security Improvements	Date:
Project Number: 201621.51	RFI #: (to be supplied by Architect)
Architect / Engineer: Chris Davis, AIA	PWArchitects, Inc. 2120 Forum Blvd., Ste. 101 Columbia, MO 65203
Bidder/Contractor Requesting Information:	

This is a clarification to resolve questions and/or conflicts in the plans and specifications. Any changes as a result of the response to the question below will be addressed under separate cover.

Information/Clarification Requested:

Drawing Sheet or Specification Section Number:

Contractor's Representative Signature:

Response to RFC:

Signature/Project Architect:

Date:

CC:
Encl:
File:

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SECTION 00 25 13

PRE-BID CONFERENCE

PART 1 - GENERAL

1.01 General

A. A mandatory pre-bid conference will be held on **Monday, January 4th, 2021** at 10:00 am at Roseta, 1100 S Roseta, Columbia, Missouri 65201. This is a **MANDATORY** Pre-Bid for all General Contractors. All other bidders interested in this project are encouraged to attend.

END OF SECTION

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SECTION 00 31 32

INFORMATION AVAILABLE TO BIDDERS

PART 1 GENERAL

1.01 STORMWATER POLLUTION PREVENTION PLAN

A. A copy of the Stormwater Pollution Prevention Plan with respect to the building site follows:
   1. Title: Stormwater Pollution Prevention Plan for Construction Activities at Roseta Accessibility, Security and Safety Improvements.
   2. Date: June 25, 2020.
   3. Prepared by: Engineering Survey & Services, 1113 Fay Street, Columbia, MO 65201.
   4. Report is included as part of this section.

B. This plan identifies necessary sediment and erosion control guidelines and responsibilities that must be included in the bids.

END OF SECTION

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Stormwater Pollution Prevention Plan
for Construction Activities at:

ROSETA ACCESSIBILITY, SECURITY AND SAFETY IMPROVEMENTS

1100 S. Roseta Avenue
Columbia, Missouri 65201

Operator(s):

Columbia Public Schools
1818 West Worley Street
Columbia, Missouri 65203
Contact: Charles Oestreich (573) 214-3400

SWPPP Authorized Representative(s):

(to be filled in by Contractor after award of contract)

Company Name: _____
Company Address: _____
_____
Contact Name: _____
Contact Phone: _____

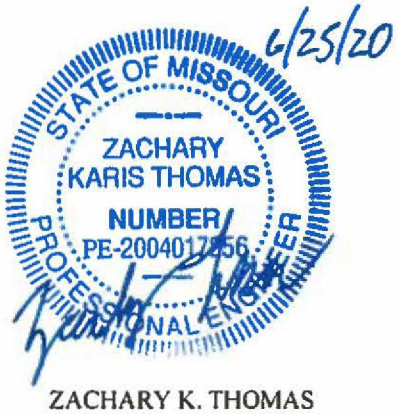
Prepared by:

Engineering Surveys & Services
1113 Fay Street
Columbia, MO 65201
Phone: 573-449-2646
Missouri Engineering Corp. # 2004005018

Project Number: 14646

SWPPP Preparation Date:

June 25, 2020



ZACHARY K. THOMAS
PROFESSIONAL ENGINEER
PE-2004017256

Estimated Project Dates:
Project Start Date: August 2020
Project Completion Date: November 2020

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APPENDIX Q: ENDANGERED SPECIES & CRITICAL HABITAT DOCUMENTATION

SECTION 1: SWPPP BASICS

1.1 GENERAL PERMITS FOR STORMWATER DISCHARGE FROM CONSTRUCTION SITES

The Clean Water Act and associated federal regulations require nearly all construction site operators engaged in clearing, grading, and excavating activities that disturb one acre or more, including smaller sites in a larger common plan of development or sale, to obtain coverage under a National Pollutant Discharge Elimination System (NPDES) permit for their stormwater discharges. Under the NPDES program, the U.S. Environmental Protection Agency (EPA) has authorized the State of Missouri to implement the federal requirements and issue stormwater permits. The Missouri Department of Natural Resources (MDNR), as administrative agent for the Missouri Clean Water Commission, issues these permits as land disturbance permits. To obtain the permit for compliance with the regulations for land disturbance it is necessary to request coverage under the MDNR Missouri State Operating Permit – General Permit. The permit was obtained through MDNR's ePermitting process available online and is included in Appendix A.

Local requirements by Boone County also require the submittal of their land disturbance permit application and a construction plan(s) prepared for the site. The construction plan(s) consists of two parts: site grading and erosion control map(s)/plan(s), and a site-specific written document that identifies and describes stormwater pollution sources and prevention methods referred to as a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP for the site must be prepared and followed during construction activities in accordance with the state NPDES Permit and local County requirements. Plans and SWPPP must be approved by Boone County prior to commencement of construction activities.

1.2 BEST MANAGEMENT PRACTICES

If sediment and erosion controls and good housekeeping practices are not followed, construction activity can result in the discharge of significant amounts of sediment and other pollutants via stormwater runoff. The term Best Management Practices or BMPs is often used to describe the controls and activities used to prevent stormwater pollution. BMPs can be divided into two main categories – structural and non-structural BMPs. Structural BMPs include silt fences, sedimentation ponds, erosion control blankets, and temporary or permanent seeding, while non-structural BMPs include picking up trash and debris, sweeping up nearby sidewalks and streets, maintaining equipment, and training site staff on erosion and sediment control practices. In this document, the term "BMPs" is used broadly and includes both structural and non structural controls and practices.

1.3 PURPOSE OF STORMWATER POLLUTION PREVENTION PLAN

The purpose of the SWPPP is to ensure the design, implementation, management, and maintenance of BMPs in order to reduce the amount of sediment and other pollutants in storm water discharges associated with the land disturbance activities; comply with Missouri Water Quality Standards; and ensure compliance with the terms and conditions of the land disturbance permits(s). Copies of these permits shall be included in Appendix A. The SWPPP document shall:

- Identify potential sources of stormwater pollution at the construction site
- Describe practices to reduce pollutants in storm water discharges from the construction site.
- Identify procedures the Operator will implement to comply with the terms and conditions of the land disturbance permit(s).

1.4 NOTICE OF INTENT

The Operator has petitioned for storm water discharges associated with the land disturbance activities at this site to be covered by Missouri's MDNR Operating Permit – General Operating Permit and the Boone County Land Disturbance Permit. The MDNR permit was obtained through MDNR's ePermitting process available online and is included in Appendix A. The application for the Boone County Land Disturbance Permit is included in Appendix B. This serves as the Notice of Intent (NOI) for the project.

1.5 AUTHORIZED REPRESENTATIVE

All reports, including SWPPPs and inspection reports, must be signed by the Operator or a duly authorized representative of that entity. For this project the Operator has chosen to designate the Contractor as an authorized representative as indicated in the signed statement located in Appendix C.

1.6 RESPONSIBILITIES OF THE CONTRACTOR

The authorized representative, or Contractor, shall be responsible for the management of the discharge of stormwater from the site in accordance with the Missouri NPDES General State Operating Permit, Boone County Land Disturbance Permit conditions and the provisions of this SWPPP. The Contractor shall be responsible for implementing all aspects of this SWPPP and conducting the stormwater management practices in accordance with the permit(s). The Contractor shall be responsible for providing qualified inspectors to conduct the inspections required by this SWPPP and for notifying each subcontractor or entity (including utility crews and city employees or their agents) who will perform work at the site of the existence of the SWPPP and what actions or precautions shall be taken while on site to minimize the potential for erosion and damage to BMPs. The Contractor shall be responsible for any enforcement action taken or imposed by federal, state, or local agencies, including the cost of fines, construction delays, and remedial actions resulting from the Contractor's failure to comply with the permit provisions. It shall be the responsibility of the Contractor to make any changes to the SWPPP necessary when the Contractor or any of his subcontractors elects to use borrow or fill or material storage sites, either contiguous to or remote from the construction site, when such sites are used solely for this construction site. Such sites are considered to be part of the construction site covered by the permit and this SWPPP. Off-site borrow, fill, or material storage sites which are used for multiple construction projects are not subject to this requirement, unless specifically required by state or local jurisdictional entity regulations. The Contractor should consider this requirement in negotiating with earthwork subcontractors, since the choice of an off-site borrow, fill, or material storage site may impact their duty to implement, make changes to, and perform inspections required by the SWPPP for the site.

1.7 RESPONSIBILITIES OF THE CONTRACTOR TO OPERATOR

The Contractor shall monitor the suitability of the designated management practices to achieve the stormwater quality provisions of the permit(s), and shall notify the Operator of the need to change management practices if necessary. If changes are ordered by the Operator, an adjustment in the Contractor's fee shall be considered in accordance with the General Conditions of the specifications. However, the Contractor's failure to monitor or report deficiencies to the Operator shall result in the Contractor being liable for fines and construction delays resulting from any federal, state, or local agency enforcement action.

1.8 AUTHORIZED REPRESENTATIVE AND SUBCONTRACTORS CERTIFICATION

The SWPPP Authorized Representative Certification must bear the signature of an authorized representative of the Contractor certifying that they are familiar with the terms and conditions of the MDNR Operating Permit – General Operating Permit, Boone County Land Disturbance Permit, and shall comply with the requirements of the SWPPP developed for this construction site. The Authorized Representative is responsible for ensuring that all contractors and subcontractors whose activities provide the potential for storm water pollution comply with the SWPPP. Some Contractors require each subcontractor whose activities provide the potential for storm water pollution to sign the SWPPP Subcontractor's Certification and make the same certification as the Authorized Representative. These forms are located in Appendixes C and D of this document. Copies of these pages shall be created as necessary to accommodate all subcontractors for this project. For easier tracking, a List of Subcontractors is provided in Appendix E to be filled out by the Contractor. All of the signed forms shall be kept in Appendixes C thru F as part of this document.

1.9 ONSITE REQUIREMENTS AND PUBLIC NOTICE

The Contractor shall keep a copy of the SWPPP maps and the SWPPP with all related documents onsite when land disturbance operations are in progress, or other operational activities that may affect the maintenance or integrity of the BMP structures are in progress.

The SWPPP must be made available to any stormwater regulatory authorities upon request.

The Contractor shall post and maintain a copy of the public notification information required in the MDNR Land Disturbance Permit included in Appendix A and the notice included in Appendix K at the main entrance to the site. The public notification sign must be visible from the public road that provides access to the site's main entrance. The public notification sign must remain posted at the site until the permit has been terminated.

SECTION 2: COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS

2.1 GENERAL

The Contractor shall obtain copies of any and all federal, state, and local regulations that are applicable to stormwater management, erosion control, and pollution minimization at this job site and shall comply fully with such regulations. The Contractor shall submit written evidence of such compliance if requested by the Operator or any agent of a regulatory body. The Contractor shall comply with all conditions of the MDNR Operating Permit – General Operating Permit, including the conditions related to maintaining the SWPPP and evidence of compliance with the SWPPP at the job site and allowing regulatory personnel access to the job site and to records in order to determine compliance.

SECTION 3: SITE EVALUATION, ASSESSMENT, AND PLANNING

3.1 PROJECT/SITE INFORMATION

Project/Site Name: Roseta Accessibility, Security and Safety Improvements
Project Street/Location: 1100 S. Roseta Avenue
City: Columbia State: MO ZIP Code: 65201
County or Similar Subdivision: Boone County

Latitude/Longitude:

Latitude: 38 ° 56 ' 12 " N (degrees, minutes, seconds)

Longitude: 92 ° 16 ' 19 " W (degrees, minutes, sec)

Method for determining latitude/longitude:

☐ USGS topographic map (specify scale: _____) ☐ EPA Web site ☐ GPS

☒ Other (please specify): Google Earth

Is the project located in Indian country? ☐ Yes ☒ No

If yes, name of Reservation, or if not part of a Reservation, indicate "not applicable." N/A

Is this project considered a federal facility? ☐ Yes ☒ No

NPDES project or permit tracking number: MORA16148

A general location map (i.e., USGS 1"=2000' quadrangle map) with enough detail to identify the location of the construction site, direction of storm water flow, the receiving water within one (1) mile of the site, locations of off-site material, waste, borrow, and equipment storage areas, surface waters and wetlands, and storm water discharge locations as required by MDNR is included in Appendix J.

3.2 CONTACT INFORMATION/RESPONSIBLE PARTIES

Operator(s):

Columbia Public Schools
1818 West Worley Street
Columbia, Missouri 65203
Charles Oestreich
(573) 214-3400
COestreich@cpsk12.org

SWPPP Authorized Representative(s) (can be: general contractor: project/construction manager(s) or site supervisor(s); see also APPENDIX C): *(to be filled in by Contractor after award of contract)*

Company or Organization Name:

_____

Address:

_____

City, State, Zip Code:

_____

Contact Name:

_____

Contact Telephone Number:

_____

Contact Email: _____

Insert area of control (if more than one operator at site) :

_____

_____

General Contractor: (can be Project/Construction Manager(s) or Site Supervisor(s)):
(to be filled in by Contractor after award of contract)

Company or Organization Name:

_____

Address:

_____

City, State, Zip Code:

_____

Contact Name:

_____

Contact Telephone Number:

_____

Contact Email: _____

Insert area of control (if more than one operator at site):

_____

_____

This SWPPP was Prepared by:

Engineering Surveys & Services
1113 Fay Street
Columbia, MO 65201
Zachary Thomas
Phone: 573-449-2646
zthomas@ess-inc.com

Subcontractor(s):

See Appendix E

Emergency 24-Hour Contact: *(to be filled in by Contractor after award of contract)*

Company or Organization Name:

_____

Contact Name:

_____

Contact Telephone Number:

_____

3.3 NATURE AND SEQUENCE OF CONSTRUCTION ACTIVITY

The general scope of the work for the project is as follows:

The project consists of accessibility, security, and safety improvements to an existing elementary school. The project will include parking lot construction, sidewalk construction, playground construction, sewer and utility systems, and site landscaping. Soil disturbing activities will include: clearing and grubbing, installing erosion and sediment controls, grading, installation of underground utilities, parking lot construction, playground construction, and preparation for final seeding, mulching, and landscaping.

What is the function of the construction activity?

☐ Residential ☒ Commercial ☐ Industrial ☐ Road Construction ☐ Linear Utility
☐ Other (please specify):

Estimated Project Start Date: **08 / 01 / 2020**
Estimated Project Completion Date: **11 / 30 / 2020**

3.4 SOILS, SLOPES, VEGETATION, AND CURRENT DRAINAGE PATTERNS

Soil type(s): The current soil type is loam, clay, and clay loam.

Slopes (describe current slopes and note any changes due to grading or fill activities): Pre project the site consisted of developed, moderately rolling 1 to 20% slopes. Post project the majority of the site will be flatter at 2-5% slopes with 3:1 daylight slopes and retaining walls in some areas.

Drainage Patterns (describe current drainage patterns and note any changes due to grading or fill activities): Pre project a majority of the site drains to the southwest to gutters/inlets along S. Roseta Avenue. A small area along the northern property line drains to adjacent MoDOT roadside swales (Hwy WW). Post project the site will drain in a similar fashion.

Vegetation: Pre project the site consisted of an existing elementary school, parking lots, playgrounds, and landscape areas. Post project the site will be very similar, consisting of impervious areas, and landscaped/turf green space areas.

Other: None.

3.5 CONSTRUCTION SITE ESTIMATES

The following are estimates of the construction site.

Total site area:	10.0 acres
Construction project area to be disturbed:	2.4 acres
Percentage impervious area before construction:	17.0 %
Runoff coefficient before construction:	0.40
Percentage impervious area after construction:	16.9 %
Runoff coefficient after construction:	0.40

$$[0.30(8.31) + 0.90(1.69)] / 10.00 = 0.40$$

Estimated disturbed area of off-site borrow and fill areas: 0.00 acres

3.6 RECEIVING WATERS

Description of receiving waters: An unnamed tributary of South Fork Grindstone Creek. These waters are listed by MDNR as 303d impaired waters or waters subject to Total Maximum Daily Loads (TMDLs). The pollutant causing impairment is Escherichia coli, from a rural non-point source. Construction is not anticipated to contribute to the impairment of the stream; therefore, no additional requirements apply. Verification can be found with the current 303d List printed from the MDNR website and placed in Appendix P.

Description of receiving storm sewer systems: City of Columbia storm sewer system and MoDOT roadside swales along Highway WW.

Stormwater velocity reduction methods at outfall(s): All outfalls will consist of flared end sections with rip-rap and geotextile fabric.

3.7 JURISDICTIONAL WETLANDS AND/OR OTHER SURFACE WATERS

No evidence of jurisdictional wetlands or surface waters of the United States were observed during site reconnaissance. The entire site has been an elementary school campus with buildings, pavement, storm sewers, and

mowed lawn areas for decades.

3.8 SITE FEATURES AND SENSITIVE AREAS TO BE PROTECTED

No evidence of sensitive areas or features were found on the site.

3.9 POTENTIAL SOURCES OF POLLUTION

Sediment is the principal stormwater pollutant of concern for this project. There are, however, other pollutants that may be found, usually in substantially smaller amounts, in stormwater runoff from construction sites. Potential sources of pollutants to stormwater runoff from this project are noted in the following table:

Potential Construction Site Pollutants										
Possible Source	Pollutants									Location
	Sediment	Nutrients	Heavy Metals	pH (acids & bases)	Pesticides & herbicides	Oil & grease	Bacteria & viruses	Trash, debris, solids	Other toxic chemicals	
Clearing & Grubbing	X							X		Within clearing limits
Grading & site excavation	X									Within grading limits
Vehicle Tracking	X					X				Construction roads onsite and/or nearest public roadway(s) providing site access
Topsoil stripping & stockpiling	X									Within grading limits
Paving Operations	X							X		Paving areas
Concrete washout & waste			X	X				X		Designated concrete wash out area(s)
Structure construction/painting/ cleaning		X		X				X	X	Structure location(s) & designated wash out area(s)
Demolition and debris disposal	X							X		Demo areas
Dewatering operations	X	X								Where necessary. Typically footing and trenching locations.
Drilling and blasting operations	X			X				X		Where necessary in cut areas.
Material delivery and storage	X	X	X	X	X	X		X	X	Designated staging area(s)
Material use during building process		X	X	X	X	X		X	X	Building construction area(s)
Solid waste (trash and debris)								X	X	Designated trash receptacle(s)
Hazardous waste			X	X	X	X			X	Designated staging area(s) and building construction area(s)
Contaminated spills		X	X	X	X	X			X	Designated staging areas and building construction area(s)
Sanitary/septic waste		X		X			X		X	Designated port-a-potty area(s)
Vehicle/equipment use and storage						X			X	Designated vehicle storage and refuel area(s)
Landscaping operations	X	X						X		Landscaping area(s)

3.10 ENDANGERED SPECIES CERTIFICATION

Is there evidence of endangered/threatened species or critical habitats on or near the project area?

☐ Yes ☒ No

Describe how this determination was made:

The entire site has been an elementary school campus with buildings, pavement, storm sewers, sidewalks, and mowed lawn areas for decades. No evidence of endangered species or critical habitat was observed during site reconnaissance. The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consulting (IPaC) has verified there are no records of federal or state listed threatened or endangered species, or their critical habitat present at the project area. The IPaC report can be found in Appendix Q.

If yes, describe the species and/or critical habitat: N/A

3.11 HISTORIC PRESERVATION

Are there any historic sites on or near the construction site?

☐ Yes ☐ No ☒ Not Applicable

3.12 APPLICABLE FEDERAL, TRIBAL, STATE OR LOCAL PROGRAMS

State of Missouri Clean Water Law requirements administered through the Missouri Department of Natural Resources (MDNR) apply. Local programs include Boone County land disturbance and development requirements. No tribal programs apply. Permits for the state and local land disturbance programs are included in Appendix A.

3.13 MAPS

All site maps for this SWPPP shall be the following civil construction plan sheets prepared for this project:

Sheet #	Plan Title	Plan Date
C0.01	Cover Sheet	Latest sealed date by Civil Engineer and approved by authority having jurisdiction.
C0.02	General Notes	
V1.01	Boundary & Topographic Survey	
C1.01	Demolition Plan	
C2.01	Overall Site Plan	
C3.01	Site Plan	
C4.01	Grading & Drainage Plan	
C5.01	Storm Sewer Profiles	
C6.01	Erosion Control Plan	
C7.01-C7.03	Site Details	
C8.01	Right-Of-Way Details	
C9.01-C9.02	Storm Sewer Details	
C10.01-C10.02	Erosion Control Details	
C11.01	Storm Sewer Drainage Area Map	
L1.01-L1.02	Landscape Plan	

The Contractor shall make copies of the site maps, fold them, and put them in the onsite SWPPP for documentation. The Contractor shall then track progress and document maintenance or amendments to the SWPPP via dating and redlining these site maps. If a redlined plan becomes to full to be easily legible and understood, simply date and fold it, put it in the onsite SWPPP for documentation, and start a new one. That way, there is a good hard copy record of what has occurred onsite.

Site maps should show the construction activities and stormwater management practices for each major phase of construction (initial grading, infrastructure, construction, and stabilization). Site maps should identify the following features:

- Stormwater flow and discharges
- Areas and features to be protected
- Disturbed areas (locations and timing of activities)
- Clearing limits
- Identify locations of structural and non-structural BMPs
- Identify locations of Post-construction BMPs
- Areas of stabilization
- Indicate locations of material, waste, borrow, or equipment storage

The site maps should show changes that have been made to the construction site, and BMPs and stabilization methods as the site progresses. The SWPPP shall be kept up to date, so redline the site maps with the locations and dates of any changes being made. Also include the current locations of the following:

- Portable toilets
- Material storage, vehicle and equipment fueling and maintenance areas
- Concrete, paint and stucco washouts
- Dumpster containers
- Spill kits
- Stockpiles
- All other BMPs and whatever changes have been done to them
- Environmentally sensitive areas
- Stream buffers
- SWPPP amendments

SECTION 4: EROSION AND SEDIMENT CONTROL BMPS

4.1 GENERAL

The BMPs shall be constructed or applied in accordance with this SWPPP, maps or construction plans, and all State or local requirements. Good engineering practices shall be used if there is a lack of information or changes are proposed for a BMP. The Contractor shall install the BMPs in the order indicated in the construction plans. BMPs shall be applied within the timeframe specified in the permit.

The Contractor shall be responsible for implementing all aspects of the SWPPP, including all BMPs. The Contractor may designate these tasks to certain subcontractors as they see fit, but the ultimate responsibility for implementing these BMPs and ensuring their proper functioning remains with the Contractor. An Implementation Schedule can be found in Appendix G.

To ensure that controls are adequately implemented, it is important that the work crews who install the BMPs are experienced or adequately trained. Improperly installed BMPs have little or no effect and may adversely affect the pollution of stormwater. It is important that all workers on the construction site are aware of the BMPs so they do not inadvertently disturb or remove them.

Additional information for BMPs are available in the latest version of: “Protecting Water Quality: a field guide to erosion, sediment and stormwater best management practices for development sites in Missouri and Kansas”, available on the MDNR website.

4.2 MINIMIZE DISTURBED AREA AND PROTECT NATURAL FEATURES AND SOIL

BMP:	**Topsoiling: Removal, Stockpiling, and Replacement**
Responsible Staff:	
Location:	Within project grading areas only.
Installation Schedule:	After all perimeter erosion and sediment controls are in place and after clearing and grubbing is completed.
Description:	
Topsoil shall meet the definition provided in the specifications. If specifications are not provided it shall be defined as the top layer of the soil profile usually richest in organic matter and nutrients consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects larger than 2 inches (50 mm) in diameter; and free of weeds, roots, toxic materials, or other nonsoil materials. A pH range of 5.0-7.5 is acceptable. Topsoil will be stripped to a minimum depth of 4" or as indicated in the geotechnical report or specifications for the project. Depths of removal may also vary as encountered in the field and directed by the geotechnical engineer. The topsoil will be stockpiled where indicated in the civil construction plans. The stockpile(s) will be in areas that will not interfere with construction phases and at least 15 feet away from concentrated flows. A silt fence shall immediately be installed around the perimeter of each stockpile, in accordance with silt fence design specifications per this SWPPP. If stockpiles are to remain for longer than 14 days, they shall be temporarily seeded as indicated in this SWPPP. Stockpiles that will remain longer than 6 months shall be permanently seeded as indicated in this SWPPP. All rough grading operations within landscape areas shall be completed 4" below finish grade to allow the placement of 4" of topsoil (or depth per specifications). To provide an optimum growing medium and allow for rainfall infiltration, the topsoil shall be placed in one lift with light compaction not to exceed 85-90% maximum dry density according to ASTM D698. Do not drive over any areas of topsoil placement to avoid further compaction.	
Maintenance & Inspection:	
All areas shall be inspected during routine SWPPP inspections to ensure the stockpiles and surrounding silt fence(s) are stable and functioning as intended. Inspect the silt fence(s) per the silt fence BMP description in this SWPPP. If required, inspect vegetation establishment on stockpile and correct as necessary. Inspect topsoil that has been spread for erosion, over compaction, and poor vegetation establishment. Correct over compacted areas by tilling 4" deep and smoothing and reseeding or sodding. Determine cause of erosion and correct as necessary immediately. Fertilize, reseed and mulch, (or resod if required) and water all areas of poor vegetation establishment.	
Removal Requirements:	At the completion of the project, remove all silt fence from stockpiles. Remove all stockpiles by spreading leftover topsoil onsite in areas directed by Operator. Seed, mulch, and water all disturbed areas.

4.3 PHASE CONSTRUCTION ACTIVITY

BMP:	**Phased Grading**
Responsible Staff:	
Location:	Project grading limits.
Installation Schedule:	Per the Sequence of Events on the civil construction plans Cover Sheet.
Description:	
Because of the relatively small project area, it is not practical to perform phased grading at this site.	

To minimize potential erosion, only areas necessary to construct the construction exit(s), perimeter sediment controls shall be disturbed initially. These areas shall be cleared, grubbed, and graded and the construction exit(s) shall be installed. Further clearing, grubbing, and grading shall then proceed only within areas where immediate earthwork is needed. Erosion and sediment controls shall be implemented immediately after construction allows but no later than 14 days after construction ceases.
Maintenance & Inspection:
Responsible staff shall be constantly aware of the construction schedule and make whatever adjustments may be necessary to minimize the amount of disturbed area at any one time. Inspections shall be made weekly to ensure all graded areas are property stabilized immediately after completion of construction or if there will be a break in land disturbance activities longer than 14 days.

4.4 PERMANENT STRUCTURAL BMPs

BMP:	**Rip-Rap**
Responsible Staff:	
Location:	Where indicated in the civil construction plans.
Installation Schedule:	Immediately after completion of storm sewer outlet structure and/or completion of finish grading in rip-rap area(s).
Description:	
Rip-rap consists of large rock placed over a geotextile fabric on the ground around in areas of concentrated stormwater flow. Typically these areas are immediately downstream of storm sewer flared end sections and at basin emergency spillways. The can also line drainage channels and stream banks. The purpose of rim-rap is to provide a rough, stable media that will slow the stormwater down as it overland flows across the rip-rap. This reduction in velocity will reduce erosion. Install as detailed in the civil construction plans.	
Maintenance & Inspection:	
All rip-rap shall be inspected during routine SWPPP inspections for proper functioning, stability, trash build up, clogging, piping, scour holes, dislodged rock, and structural integrity. Remove all weed and brush growth and apply herbicide at least once during the growing season. All repairs/maintenance shall be done immediately.	

BMP:	**Vegetated Swales/Channels**
Responsible Staff:	
Location:	Where indicated in the civil construction plans.
Installation Schedule:	Per the Sequence of Events on the civil construction plans Cover Sheet.
Description:	
Vegetated swales/channels consist of broad, shallow, constructed channels with a dense stand of turf grass covering. They may have an erosion control blanket for added erosion protection and typically have a trapezoidal cross section. Their intent is to convey concentrated overland flow in a slow manner to promote infiltration and reduce erosion/maintenance. Install as detailed in the civil construction plans.	
Maintenance & Inspection:	
All swales/channels shall be inspected during routine SWPPP inspections for proper vegetation establishment, functioning, stability, trash build up, clogging, piping, sediment, scour holes, and erosion. Remove sediment when it has reached 1/3 of the total design depth of the swale. If installed, inspect the erosion control blanket for proper function and verify there is no erosion under the blanket. All repairs/maintenance shall be done immediately.	

4.5 TEMPORARY STRUCTURAL BMPs

BMP:	**Silt Fence**
Responsible Staff:	
Location:	Where indicated on the civil construction plans & as necessary.
Installation Schedule:	Per the Sequence of Events on the civil construction plans Cover Sheet.
Description:	
Silt fence consists of a geotextile fabric that is attached to supporting posts and trenched into the ground. This is applied where sheet erosion (not channelized) occurs over small areas. It is typically installed at the same elevation following the contour of the land. Its purpose is to filter sediment laden runoff on the uphill side. Install as detailed in the civil construction plans.	
Maintenance & Inspection:	
All silt fence shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Verify the fence posts are still structurally sound, the fabric is still securely attached to the fence posts, and the fabric is still trenched into the ground with no runoff occurring under the fence. Remove built up sediment when it has reached 1/3 the height of the fence. Take care to avoid undermining the fence during sediment removal. All repairs/maintenance shall be done immediately.	
Removal Requirements:	Remove when the disturbed area draining to the BMP is stabilized. The area is considered stabilized when perennial vegetation or permanent materials (buildings, pavement, etc) cover all areas that have been disturbed. Vegetative cover shall be at least 70% of fully established density over the entire disturbed area that is to be vegetated. Areas disturbed during the removal of the BMP shall be smooth graded and permanently seeded and mulched.

BMP:	**Sediment Logs / Fiber Rolls**
Responsible Staff:	
Location:	Where indicated on the civil construction plans & as necessary.
Installation Schedule:	Per the Sequence of Events on the civil construction plans Cover Sheet.
Description:	
Sediment logs consist of compressed excelsior, coconut, or other fibers compressed in a tubular netting. They typically are 9" or 12" in diameter (sometimes larger) and 10' to 25' lengths. They are typically placed across channel bottoms, or on the contour on hill slopes to break up slope lengths and slow overland flow. They are typically staked in place with wooden stakes. Sediment logs are used to slow water velocity, trap sediment, and enhance revegetation. They are often used in place of silt fence, rock ditch checks, or straw bale ditch checks. Acceptable products are American Excelsior Company AEC Curlex Sediment Log or or approved equal. Sediment Log diameters are shown on the civil construction plans. Install per the manufacturer written instructions.	
Maintenance & Inspection:	
All sediment logs shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Verify the posts are still structurally sound, and the log is still trenched into the ground with no runoff occurring under the log. Remove built up sediment when it has reached 1/2 the height of the log. Take care to avoid undermining the log during sediment removal. All repairs/maintenance shall be done immediately.	
Removal Requirements:	Remove when the disturbed area draining to the BMP is stabilized. The area is considered stabilized when perennial vegetation or permanent materials (buildings, pavement, etc) cover all areas that have been disturbed. Vegetative cover shall be at least 70% of fully established density over the entire disturbed area that is to be vegetated.

	Areas disturbed during the removal of the BMP shall be smooth graded and permanently seeded and mulched.

BMP:	**Silt Fence Inlet Protection**
Responsible Staff:	
Location:	Where indicated on the civil construction plans.
Installation Schedule:	Immediately after construction of each storm sewer inlet.
Description:	
Silt fence inlet protection is reinforced silt fence installed completely around a stormwater inlet to filter and pond sediment laden runoff to allow drop out of the sediment before it drains into the inlet. Install as detailed in the civil construction plans.	
Maintenance & Inspection:	
All inlet protection shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Verify the fabric and wire support is still in good condition with no rips, holes, or signs of stretching or stress. Verify the posts and supports are still structurally sound, the fabric is still securely attached to the posts and supports, and the fabric is still trenched into the ground with no runoff occurring under the fence. Remove built up sediment when it has reached 1/3 the height of the fence. All sediment removed shall be placed onsite as fill in non structural areas or as directed by the Operator. All repairs/maintenance shall be done immediately.	
Removal Requirements:	Remove when the disturbed area draining to the BMP is stabilized. The area is considered stabilized when perennial vegetation or permanent materials (buildings, pavement, etc) cover all areas that have been disturbed. Vegetative cover shall be at least 70% of fully established density over the entire disturbed area that is to be vegetated. Areas disturbed during removal of the BMP shall be smooth graded and permanently seeded and mulched.

4.6 PERMANENT NON-STRUCTURAL BMPs

BMP:	**Permanent Seeding**
Responsible Staff:	
Location:	All disturbed areas except sodded areas, surfaced areas, solid rock, or areas consisting of primarily broken rock.
Installation Schedule:	Per the Sequence of Events on the civil construction plans Cover Sheet and/or as necessary.
Description:	
Permanent seeding is the establishment of perennial vegetation for graded areas that will be undisturbed for longer than 6 months. Permanent seeding and planting shall be performed within 14 days after final grade is reached or within 7 days after final grade is reached if the slope of the area is greater than 3:1 (3 feet horizontal to 1 foot vertical) or if the slope is greater than 3% and greater than 150 feet in length, unless temporary stabilization is applied. Permanent seeding shall be completed per the project specifications or landscape plan. If no specification/plan is provided, the following methods can be applied:	
Seedbed Preparation:	
For broadcast seeding and drilling, loosen the soil via tilling to a depth of 3 inches. For no-till drilling, the soil does not need to be loosened unless the site has surface compaction. If compacted, till 3 inches deep.	

Soil Amendments:

Obtain a minimum of three soil tests from various areas on the site and add fertilizer and lime according to the test results. If soil tests are not available, spread lime evenly at a rate of 92 pounds per 1,000 square feet of area. Spread evenly a 5.5-16-16 fertilizer at a rate of 7 pounds per 1,000 square feet of area. Mix the soil amendments into the top 3 inches of soil.

Seed:

Plant seed ¼ to ½ inch deep or rake in after application. Apply mulch and water immediately after seed application. Water to a depth of 2 inches without causing erosion. Grass seed mixture recommended for use in lawn areas:

Type	% Mix by Weight	Minimum Purity	Minimum Germination	Seeding Rate (lb/acre)
Tall or Turf Fescue (minimum 3 cultivars)	80	98%	90%	150 minimum or as recommended by manufacturer
Annual Rye	20	98%	90%	25 minimum

The percent mixture by weight is for pure live seed (PLS). Weed seed shall not exceed 1.0% by weight of the mix. A seed mix certification shall be approved by the Operator prior to seeding.

Mulch:

All mulch shall consist of clean, bright, plant residues and be free of weed seeds, mold, and rot. No more than 15% of the ground surface shall be visible after mulching. Install per manufacturer's recommendations. Straw mulch shall be applied at a minimum rate of 3,000 lbs/acre.

Planting Dates:

Apply permanent seed and mulch only between the dates of February 1 thru May15 and August 15 thru October 15th. Seeding and mulching outside these dates shall be done according to temporary seeding requirements with reseeding at 50% the permanent seeding rates done during the next allowable permanent seeding planting dates.

Maintenance & Inspection:

All seeded areas shall be inspected during routine SWPPP inspections for erosion, germination, vigorous seedlings, uniform density with at least 70% ground cover, disease, drought stress, and seed wash out. Water 1 inch deep every 7 day stretch with less than ½ inch total rain accumulation until grass is 3 inches tall. Do not mow until grass is 4 inches tall, and then mow at a 3 inch height, minimum. All repairs/maintenance shall be done immediately.

BMP:	**Sodding**
Responsible Staff:	
Location:	Where indicated on the civil construction plans or landscape plans.
Installation Schedule:	Per the Sequence of Events on the civil construction plans Cover Sheet.

Description:

Sodding is the laying of vegetative cover that includes both grass plants and their established root system. Sodding shall be completed per the project specifications or landscape plan. If no specification/plan is provided, the following methods can be applied:

Soil Preparation:

Loosen the soil if the site has surface compaction. If compacted, till 3 inches deep.

Soil Amendments:

Per the sod manufacturer. If the manufacturer provides no written soil amendment requirements, obtain a minimum of three soil tests from various areas on the site and add fertilizer and lime according to the test results. If soil tests are not available, spread lime evenly at a rate of 92 pounds per 1,000 square feet of area. Spread evenly a 5.5-16-16 fertilizer at a rate of 7 pounds per 1,000 square feet of area. Mix the soil amendments into the top 3 inches of soil.

	Sod:
	Sod shall consist of, or a mixture of: turf/tall fescue, Bermuda, Zoysia, or Buffalograss cultivars suitable for the site's climate. Install in staggered rows with offset joints. Lay rows perpendicular to the slope. Tamp or roll all sod immediately after installation to provide root contact with the soil. Water thoroughly to a depth of 2 inches upon installation.
	Sodding Dates:
	Sodding can be done at any time of the year except when the ground is frozen or there is a ground cover such as snow or ice.
Maintenance & Inspection:	
All sodded areas shall be inspected during routine SWPPP inspections for erosion, vigorous growth, uniform density with at least 95% ground cover, disease, and drought stress. Water as necessary to prevent drying out. Suring summer months this can be every day. Do not mow until grass is 4 inches tall, and then mow at a 3 inch height, minimum. All repairs/maintenance shall be done immediately.	

4.7 TEMPORARY NON-STRUCTURAL BMPs

BMP:	**Construction Entrance/Exit**
Responsible Staff:	
Location:	Where indicated on the civil construction plans.
Installation Schedule:	Per the Sequence of Events on the civil construction plans Cover Sheet.
Description:	
A temporary rock construction exit is a stone base pad installed to provide an exit area where vehicles can drop the mud and caked soil from their tires to avoid transporting it onto public roads. The mud and dirt that ends up on the street is called "track out" and is the #1 complaint of construction sites. A larger stone should comprise the surface of the exit to vibrate/jar the truck and flex the rubber to encourage mud and soil to drop off. Provide water via a water truck and wash all tires and wheel wells of all vehicles prior to leaving the site. Direct all runoff into a sediment trap set up on the downstream side of the exit pad. Install as detailed in the civil construction plans.	
Maintenance & Inspection:	
All construction exits shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Shovel or wash off the rock surface often to prevent soil build up and clogging of the stone. This may need to be several times a day. If surface becomes smooth or clogged, top-dress with clean 2-3 inch stone immediately. Remove sediment from the sediment trap when it has reached ½ the design depth. All sediment removed shall be placed onsite as fill in non structural areas or as directed by the Operator. All repairs/maintenance shall be done immediately.	
Removal Requirements:	Remove when all disturbed areas are stabilized or all construction vehicles have been permanently demobilized. The area is considered stabilized when perennial vegetation or permanent materials (buildings, pavement, etc) cover all areas that have been disturbed. Vegetative cover shall be at least 70% of fully established density over the entire disturbed area that is to be vegetated. Areas disturbed during removal of the BMP shall be smooth graded and permanently seeded and mulched.

BMP:	**Pavement/Curb & Gutter Sweeping**
Responsible Staff:	
Location:	Where necessary.
Description:	
Pavement/curb & gutter sweeping involves picking up and removing all trash, debris, and sediment from onsite land disturbance activities that has accumulated on all public and private paved surfaces near the project site.	

This can be done by hand via broom, or via mechanical street sweeping and vacuum machines. The sediment shall be picked up and disposed of as onsite fill, it shall not be washed off the pavement into storm sewers or other drainage ways via pressure washing or water trucks.

Maintenance & Inspection:

All onsite and nearby offsite paved surfaces shall be inspected during routine SWPPP inspections for trash, debris, and sediment deposition on the surface. All sediment shall be removed immediately. The cause of the trash, debris, and/or sediment deposition shall be identified and immediately corrected.

BMP:	**Temporary Seeding**
Responsible Staff:	
Location:	Where indicated on the civil construction plans and/or where necessary during the construction process.
Installation Schedule:	As required or necessary.

Description:

Temporary seeding is the establishment of fast-growing annual vegetation on disturbed areas to provide erosion control for up to 6 months. This BMP applies where short-lived vegetation needs to be established before final grading or in a season not suitable for permanent seeding. If an area is expected to be undisturbed for longer than 6 months, permanent perennial vegetation shall be used. Temporary seeding and planting shall be performed within 14 days after grading operations cease or within 7 days after final grade is reached if the slope of the area is greater than 3:1 (3 feet horizontal to 1 foot vertical) or if the slope is greater than 3% and greater than 150 feet in length. Temporary seeding shall be completed per the project specifications or landscape plan. If no specification/plan is provided, the following methods can be applied:

Seedbed Preparation:

Loosen the soil via tilling to a depth of 3 inches.

Soil Amendments:

Obtain a minimum of three soil tests from various areas on the site and add fertilizer and lime according to the test results. If soil tests are not available, spread lime evenly at a rate of 69 pounds per 1,000 square feet of area. Spread evenly a 5.5-16-16 fertilizer at a rate of 6 pounds per 1,000 square feet of area. Mix the soil amendments into the top 3 inches of soil.

Seed:

Plant small grains no more than 1 ½ inches deep. Plant grasses and legumes ¼ to ½ inch deep or rake in after application. Apply mulch and water immediately after seed application. Water to a depth of 2 inches without causing erosion. Seed mixture can be any combination of the following:

Species	Seeding Rate	
	lbs. per Acre	lbs./1,000 square feet
Oats	80	2
Cereals: Rye/Wheat	90-120	2-2.5
Millets, Sudangrass	45-60	1-1.25
Annual Ryegrass	75	2
Annual Lespedeza plus Tall Fescue	15 plus 45	0.5 plus 1

Mulch:

All mulch shall consist of clean, bright, plant residues and be free of weed seeds, mold, and rot. No more than 15% of the ground surface shall be visible after mulching. Install per manufacturer's recommendations. Straw mulch shall be applied at a minimum rate of 3,000 lbs/acre.

Planting Dates:

Apply temporary seed and mulch any time of the year, but do not apply on frozen, ice or snow covered ground.

Maintenance & Inspection:

All seeded areas shall be inspected during routine SWPPP inspections for erosion, germination, vigorous seedlings, uniform density with at least 70% ground cover, disease, drought stress, and seed wash out.

Reseed and mulch as necessary. Water when dry. Do not mow or only mow after 6 inches tall and then mow at a 4 inch height, minimum. All repairs/maintenance shall be done immediately.	
Removal Requirements:	Remove when the area is ready to be disturbed again.

BMP:	**Soil Roughening**
Responsible Staff:	
Location:	All disturbed slopes 3:1 or steeper.
Installation Schedule:	Immediately after applicable slope has reached plan grade.
Description:	
Surface roughening are practices that roughen a slope surface to reduce surface runoff velocities, therefore minimizing soil erosion and sedimentation during construction. Either track walking with a dozer up and down the slope (NOT parallel or along the slope) or using a sheep's foot roller to create minimum 1" dimples are acceptable practices. Immediately after completion of roughening, stabilize the surface via vegetation establishment, rip-rap, or however indicated in the construction plans. Do no roughen with finish grading.	
Maintenance & Inspection:	
All roughening shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Inspect for erosion. Areas that show erosion shall be repaired immediately. Trash and debris shall be removed immediately. Vegetation shall be inspected and maintained per the permanent or temporary seeding BMP description. All repairs/maintenance shall be done immediately.	
Removal Requirements:	None.

BMP:	**Tackifiers and Binders**
Responsible Staff:	
Location:	Where indicated on the civil construction plans.
Installation Schedule:	Immediately after final grades are achieved.
Description:	
Tackifiers and Binders are substances used to anchor straw, hay, wood, or paper mulch by causing organic material to bind together. The binding and anchoring of the mulch minimizes or prevents movement of the mulching material from the desired location during rain or watering events. They are typically applied via hydroseeding or hydromulching techniques.	
Maintenance & Inspection:	
All tackifiers and binder application shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Inspect to verify it is functioning as intended. Inspect and repair as necessary to ensure intended function. All repairs/modifications shall be made immediately.	
Removal Requirements:	None.

BMP:	**Dust Control & Air Emissions**
Responsible Staff:	
Location:	Where necessary based on current site conditions.
Installation Schedule:	Immediately when current site conditions warrant.
Description:	
Open burning will only be allowed per state and local regulations. Contractor is responsible for obtaining all necessary burning permits.	

In Missouri, state regulation places a limit on the amount of visible dust that can leave a property boundary. For more information research state regulation 10 CSR 10-6.170. Minimize wind erosion and control dust via the following methods: 1. Cover 30% or more of disturbed surface with non-erodible material. 2. Roughening the disturbed areas to produce ridges perpendicular to the prevailing wind. Ridges should be about six (6) inches in height. 3. Frequent watering of disturbed areas.
Maintenance & Inspection:
All dust control shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Verify onsite dust creation is below state and local requirements.

4.8 ADDITIONAL BMPS

BMP:	**Stormwater Outfalls**
Responsible Staff:	
Location:	Where shown on the construction plans. Contractor shall redline on the SWPPP site maps for clarity.
Installation Schedule:	
Description:	
Stormwater outfalls are all points where stormwater drains away from the outer limits of the project area. These can be swales, creeks, or rivers, or storm sewers that daylight with a flared end section/headwall/end or pipe.	
Maintenance & Inspection:	
All stormwater outfalls and 50 feet downstream shall be inspected during routine SWPPP inspections for proper functioning, stability, erosion, sediment disposition, and general condition. All repairs/maintenance shall be done immediately.	

BMP:	**Management of Excavation Spoil Materials**
Responsible Staff:	
Location:	Where indicated in the construction plans.
Installation Schedule:	
Description:	
Excavation spoil materials result from localized grading that occurs post mass grading for footings, docks/truckwells, utility trenches, geowells, etc. These materials must be properly managed to prevent them from contributing to storm water discharges. The materials generated from the development of this project shall be managed by the following method: mixed with on-site fill, hauled off-site. If they must be temporarily stockpiled, they shall be placed where all storm water runoff will drain to a BMP and temporarily seeded and mulched immediately after construction.	
Maintenance & Inspection:	
All excavation spoil materials shall be inspected during routine SWPPP inspections for proper functioning, stability, erosion, and general condition. Verify all stockpiles drain to properly functioning BMPs and no untreated storm water runoff is occurring. All repairs/maintenance shall be done immediately.	

BMP:	**Dewatering (if necessary)**
Responsible Staff:	
Location:	
Installation Schedule:	
Description:	
Dewatering operations from footing/trench/etc. excavations shall not be discharged offsite without treatment. Turbid dewatering discharge shall be directed to another BMP to allow filtering or settling prior to discharging offsite. *(below to be filled in by Contractor)* Dewatering Methods: Dewatering Maximum Flow: GPM BMP(s) Dewatering Will be Directed To:	
Maintenance & Inspection:	
All dewatering operations shall be inspected during routine SWPPP inspections for proper functioning, stability, erosion, and general condition. Verify all dewatering discharge drains to properly functioning BMP(s) and no untreated storm water runoff is occurring. Verify the BMP(s) are properly handling the amount of dewatering discharge they are receiving. All repairs/maintenance shall be done immediately.	

SECTION 5: GOOD HOUSEKEEPING BMPS

5.1 MATERIAL HANDLING AND WASTE MANAGEMENT

Substances regulated by federal law under the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) which are transported, stored or used for maintenance, cleaning or repairs shall be managed according to the provisions of RCRA and CERCLA.

The following materials or substances with known hazardous properties are expected to be present onsite during construction:

Concrete/Additives/Wastes
Detergents
Paints/Solvents
Acids
Solids and construction wastes
Soil stabilization additives
Cleaning solvents
Petroleum based products
Pesticides
Fertilizers
Sanitary wastes

All paints, solvents, petroleum products and petroleum waste products (except fuels) and storage containers (such as drums, cans or cartons) shall be stored such that these materials are not exposed to storm water. Sufficient practices of spill prevention, control and/or management shall be provided to prevent any spills of these pollutants from entering a water of the state. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater. The following are the material management practices that shall be used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff. The jobsite superintendent shall be responsible for ensuring that these procedures are followed.

a) Good Housekeeping

The following good housekeeping practices shall be followed onsite during the construction project.

(i) An effort shall be made to store only enough products required to do the job.
(ii) All materials stored onsite shall be stored in a neat, orderly manner and, if possible, under a roof or in a containment area. At a minimum, all containers shall be stored with their lids on when not in use. Drip pans shall be provided under all dispensers.
(iii) Products shall be kept in their original containers with the original manufacturer's label in legible condition.
(iv) Substances shall not be mixed with one another unless recommended by the manufacturer.
(v) Whenever possible, all of a product shall be used up before disposing of the container.
(vi) Manufacturer's recommendations for proper use and disposal shall be followed.
(vii) The job site superintendent shall be responsible for daily inspections to ensure proper use and disposal of materials.
(viii) Fertilizers shall be applied in the minimum amounts recommended by the manufacturer.
(ix) All paint containers shall be tightly sealed and stored when not required for use. Excess paint shall not be dumped into the storm sewer system but shall be properly disposed of according to manufacturer's instructions and State regulations.

b) Hazardous Products

These practices shall be used to reduce the risks associated with hazardous materials. Material Safety Data Sheets (MSDS's) for each substance with hazardous properties that is used on the job site shall be obtained and used for the proper management of potential wastes that may result from these products. An MSDS shall be posted in the immediate area where such product is stored and/or used and another copy of each MSDS shall be maintained in the SWPPP file at the job site construction trailer office. Each employee who must handle a substance with hazardous properties shall be instructed on the use of MSDS sheets and the specific information in the applicable MSDS for the product he/she is using, particularly regarding spill control techniques.

(i) Products shall be kept in original containers with the original labels in legible condition.
(ii) Original labels and material safety data sheets (MSDS's) shall be procured and used for each material.
(iii) If surplus product must be disposed of, manufacturer's or local/state/federal recommended methods for proper disposal shall be followed.

c) Hazardous Waste

All hazardous waste materials shall be disposed of by the Contractor in the manner specified by local, state, and/or federal regulations and by the manufacturer of such products. Site personnel shall be instructed in these practices by the job superintendent, who shall be responsible for seeing that these practices are followed.

d) Product Specific Practices

The following product specific practices shall be followed on the job site.

(i) Petroleum Products

All onsite vehicles shall be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products shall be stored in tightly sealed containers that are clearly labeled. Any petroleum storage tanks used onsite shall have an impervious dike or berm containment structure constructed around it to contain any spills which may occur. Drip pans shall be provided for all dispensers. Any asphalt substances used onsite shall be applied according to the manufacturer's recommendations. The location of any fuel tanks and/or equipment storage areas shall be identified on the SWPPP maps by the Contractor once the locations have been determined.

(ii) Fertilizers

Fertilizers shall be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer shall be worked in the soil to limit exposure to stormwater. Storage shall be in a covered shed. The contents of any partially used bags of fertilizer shall be transferred to a sealable plastic bin to avoid spills.

(iii) Paints, Paint Solvents, and Cleaning Solvents

All containers shall be tightly sealed and stored when not in use. Excess paint and solvents shall not be discharged to the storm sewer system but shall be properly disposed of according to manufacturer's instructions or state and federal regulations.

BMP:	**Construction Waste Materials Containment**
Responsible Staff:	
Location:	
Installation Schedule:	
Description:	
All non hazardous waste materials shall be collected and stored in an appropriately covered container and/or securely lidded metal dumpster rented from a local waste management company which must be a solid waste management company licensed to do business in the project area. The dumpster shall comply with all local and state solid waste management regulations. All trash and construction debris from the site shall be deposited in the dumpster. The dumpster shall be emptied a minimum of twice per week or more often if necessary, and the trash shall be hauled to a landfill approved by the state for legal disposal offsite. No construction waste or trash materials of any kind shall be buried on site. All personnel shall be instructed regarding the correct procedures for waste disposal. All waste dumpsters and roll-off containers shall be located in an area where the likelihood of the containers contributing to storm water discharges is negligible. If required, additional BMPs shall be implemented, such as sandbags around the base, to prevent wastes from contributing to storm water discharges. The location of waste dumpsters and roll-off containers shall be identified on the SWPPP maps by the Contractor once the locations have been determined.	
Maintenance & Inspection:	
All dumpsters and/or other waste storage areas shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Dumpsters shall be emptied before trash accumulation prevents complete closure of the lid(s). If trash and construction debris are exceeding the dumpster capacity more dumpsters shall be provided or they shall be emptied more often.	
Removal Requirements:	Remove when all waste contributing construction is complete.

BMP:	**Sanitary Facilities**
Responsible Staff:	
Location:	
Installation Schedule:	

Description:	
Temporary sanitary facilities (portable toilets) shall be provided by a licensed portable facility provider in complete compliance with local and state regulation. Facilities shall be sized to accommodate the maximum anticipated work force on any given day. Facilities shall be property anchored to prevent tip over or other uncontrolled movement. All sanitary facilities shall be located in an area where the likelihood of the unit contributing to storm water discharges is negligible. The location of sanitary facilities shall be identified on the SWPPP maps by the Contractor once the locations have been determined.	
Maintenance & Inspection:	
All sanitary facilities shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Sanitary facilities shall be regularly emptied, serviced and repaired. Sanitary waste shall be disposed per all applicable state and local requirements.	
Removal Requirements:	Remove when construction is complete and all construction staff has left the site or when other onsite sanitary facilities are available and permission for their use by construction staff is approved by the Operator.

BMP:	**Hazardous Waste Containment**
Responsible Staff:	
Location:	
Installation Schedule:	
Description:	
All hazardous waste materials such as oil filters, petroleum products, paint, and equipment maintenance fluids shall be stored in structurally sound and sealed containers in a designated hazardous materials storage area and segregated from other non-waste materials. Additionally, all hazardous material will be disposed of in accordance with federal, state, and local regulations. Hazardous waste materials shall not be disposed of into on-site dumpsters.	
Maintenance & Inspection:	
All hazardous storage areas shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. The storage areas shall be kept clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Material safety data sheets, material inventory, and emergency contact numbers shall be maintained in the office trailer or other clearly designated area.	
Removal Requirements:	Remove when all hazardous waste contributing construction is complete.

5.2 ESTABLISH PROPER BUILDING MATERIAL STAGING AREAS

BMP:	**Staging Area**
Responsible Staff:	
Location:	
Installation Schedule:	
Description:	
Construction equipment and materials shall be stored at a designed staging area. The staging area is typically located in a proposed parking area and shall consist of an all-weather granular surface that will also be the granular base for the parking lot pavement. The location of all staging areas shall be redlined on the SWPPP maps. Storm water shall be directed away from the staging area.	
Maintenance & Inspection:	
All staging areas shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition.	

The staging area(s) shall be kept clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners shall be repaired or replaced as needed to maintain proper function. The granular surface shall be kept clean and inspected for signs of settlement or rutting. All repairs shall be made immediately.	
Removal Requirements:	Remove when all construction materials have been removed and the storage of construction equipment is no longer necessary.

5.3 DESIGNATE WASHOUT AREAS

BMP:	**Concrete Washout Area**
Responsible Staff:	
Location:	Where indicated on the civil construction plans & where necessary to contain all concrete waste and wash water.
Installation Schedule:	After grading and before any infrastructure in constructed.
Description:	
Concrete trucks shall only be allowed to wash out or discharge surplus concrete and wash water in specifically designated areas which have been prepared to prevent contact between the concrete, wash water, and stormwater runoff from the site. The washout may be constructed by creating an aboveground storage area a minimum 10' x 10' x 2' deep from straw bales or sandbags double lined with a10 mil minimum polyethylene sheeting. Washout areas may also be prefabricated units brought to the site to be emptied when full by the company providing the unit. They may also be constructed either by digging a minimum 10' x 10' pit 1' deep and surrounding it with an earthen dike a minimum 1' tall to give it a total depth of 2' and lining it with minimum 10 mil polyethylene sheeting. The washout shall be constructed so all stormwater is directed away from the washout area. Size according to anticipated concrete waste produced. The project may require the use of multiple concrete washout areas. All concrete washout areas shall be located a minimum 50' from any stormwater conveyance like a storm sewer or swale and a minimum 100' from any natural water body like a stream, pond, or lake. Temporary weatherproof signage that says "CONCRETE WASHOUT" in a manner clearly visible by construction truck drivers while driving onsite shall be placed next to each washout. The contractor shall be responsible for coordinating and enforcing proper use of the washout by all construction personnel. The hardened material from the washout(s) shall be hauled offsite and disposed of in the same manner as other non-hazardous construction waste materials or may be broken up and used on site as deemed appropriate by the Contractor and approved by the Operator. Disposal shall be per all applicable solid waste regulations.	
Maintenance & Inspection:	
All washouts shall be inspected daily to ensure all concrete washing is being discharged into the washout(s), no tears or leaks are present, and to identify when concrete waste needs to be removed. Inspect all signage to ensure it is in good condition and is still legible by all drivers. Remove all concrete waste when it has reached 75% of the storage capacity of the washout. The plastic lining shall be replaced if it is damaged during concrete waste removal. Inspect to verify that no storm water runoff is capable of draining into the washout. All repairs shall be made immediately.	
Removal Requirements:	Remove when all concrete construction is complete.

5.4 ESTABLISH PROPER EQUIPMENT/VEHICLE FUELING AND MAINTENANCE PRACTICES

BMP:	**Vehicle/Equipment Fueling and Maintenance**
Responsible Staff:	
Location:	
Installation Schedule:	
Description:	
Only minor equipment maintenance shall occur onsite. All major equipment/vehicle maintenance shall be performed off-site. Vehicle/equipment maintenance and fueling area(s) shall be clearly marked and be kept clean and dry. A spill kit shall be kept nearby. Drip pans, drip clothes, or absorbent pads shall be used when replacing spent fluids. Spent fluids shall be collected and stored in appropriate labeled containers in the proper storage areas. Recycle fluids whenever possible. Dispose of fuels, oils, lubricants, solvents, and other hazardous materials offsite per federal, state and local requirements. Petroleum products shall be stored in tightly sealed containers which are clearly labeled. No fueling, servicing, maintenance, or repair of equipment or machinery shall be done within 50 feet of a stormwater drainage way, or within 100 feet of a classified stream, lake/pond, losing stream, or sinkhole.	
Maintenance & Inspection:	
All equipment/vehicle fueling and maintenance facilities shall be inspected during routine SWPPP inspections for proper functioning, usage, and general condition. Vehicles and equipment shall be inspected on each day of use. Leaks shall be repaired immediately. Any problem vehicle(s) or equipment shall be removed from the project site. Inspect to verify there is an ample supply of spill-cleanup materials onsite.	
Removal Requirements:	Remove when the need for construction vehicles onsite is no longer necessary.

5.5 CONTROL EQUIPMENT/VEHICLE WASHING

All equipment/vehicle washing not related to dirt/mud removal at the construction entrance/exit BMP shall be done offsite.

5.6 SPILL PREVENTION AND CONTROL PLAN

BMP:	**Spill Prevention and Response Procedures**
Responsible Staff:	
Spill Prevention & Response Coordinator:	
Installation Schedule:	Training will begin prior to the start of project construction. All other procedures shall begin with the start of project construction.
Description:	
All onsite personnel shall be trained in the spill prevention, proper handling, and cleanup procedures of spilled materials. No spilled hazardous materials or hazardous wastes shall be allowed to come in contact with storm water discharges. If such contact occurs, the storm water discharge shall be contained on site until appropriate measures in compliance with state and federal regulations are taken to dispose of the contaminated storm water. Report to the Operator, Engineer, local Fire Department, Joint Communications, local Sheriff's Department, Boone County Public Works, MDNR, and EPA any noncompliance with the SWPPP that will endanger public health or the environment. Also, if the spill contains a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under 40CFR110, 40CFR117, and 40CFR302, follow the directions on the Reportable Quantity Release Form which can be found in Appendix M. Any information shall be provided orally immediately after the Contractor becomes aware of the circumstances. A written submission shall also be provided	

to Engineer, Owner, Boone County Public Works, MDNR, and EPA within five (5) days of the time the Contractor becomes aware of the circumstances. The following events require immediate verbal: a) any unanticipated bypass which exceeds any effluent limitation in the permit, b) any upset which exceeds any effluent limitation in the permit, and c) a violation of a maximum daily discharge limitation for any of the pollutants listed by the MDNR in the permit. The written submission shall contain a description of the non-compliance and its cause; the period of non-compliance, including exact dates and times, and if the non-compliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the non-compliance.

a) In order to minimize the potential for a spill of hazardous materials to come into contact with storm water, the following steps shall be implemented:

   (i) All materials with hazardous properties (such as pesticides, petroleum products, fertilizers, detergents, construction chemicals, acids, paints, paint solvents, cleaning solvents, additives for soil stabilization, concrete curing compounds and additives, etc.) shall be stored in a secure location, with their lids on, preferably under cover, when not in use.

   (ii) The minimum practical quantity of all such materials shall be kept on the job site.

   (iii) A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) shall be provided at the storage site.

   (iv) Manufacturer's recommended methods for spill cleanup shall be clearly posted and site personnel shall be trained regarding these procedures and the location of the information and cleanup supplies.

b) In the event of a spill, the following procedures shall be followed:

   (i) All spills shall be cleaned up immediately after discovery.

   (ii) The spill area shall be kept well ventilated and personnel shall wear appropriate protective clothing to prevent injury from contact with the hazardous substances.

   (iii) The project manager and the Engineer of Record shall be notified immediately.

   (iv) Spills of toxic or hazardous materials shall be reported to the appropriate federal, state, and/or local government agency, regardless of the size of the spill. Spills of amounts that exceed Reportable Quantities of certain substances specifically mentioned in federal regulations (40 CFR 110, 40 CFR 117, and 40 CFR 302) shall be immediately reported to the EPA National Response Center, telephone 1-800-424-8802. Contact the Operator, Engineer, local Fire Department, Joint Communications, local Sheriff's Department, Boone County Public Works, MDNR, and EPA immediately after the onset of a "hazardous condition". The applicant shall notify by telephone and in writing the Department of Natural Resources, Water Pollution Control Program, Post Office Box 176, Jefferson City, MO 65102, 1-800-361-4827, of any oil spills or if hazardous substances are found during the prosecution of work under this permit.

   (v) If the spill exceeds a Reportable Quantity, the SWPPP shall be modified within seven (7) calendar days of knowledge of the discharge to provide a description of the release, the circumstances leading to the release, and the date of the release, the plans shall identify measures to prevent the recurrence of such releases and to respond to such releases. The Reportable Quantity Release form located in Appendix M shall be completed in accordance with this requirement.

c) The Spill Prevention and Response Coordinator shall designate the individuals who shall receive spill prevention and response training. These individuals shall each become responsible for a particular phase of prevention and response. The names of these personnel shall be posted in the material storage area and in the office trailer/construction headquarters onsite.

BMP:	Soil Contamination
Responsible Staff:	
Spill Prevention & Response Coordinator:	
Installation Schedule:	Training will begin prior to the start of project construction. All other procedures shall begin with the start of project construction.
Description:	
Soil contamination is either solid or liquid hazardous substances mixed with the naturally occurring soil. Soil contamination results when hazardous substances are either spilled or buried directly in the soil or migrate to the soil from a spill that has occurred elsewhere. Soil contamination is typically identified in the field via visual and/or odor means. No soil contamination is known to exist on the site pre construction. If it is suspected contaminated soil has been discovered onsite or if soil contamination occurs resulting from spills of materials with hazardous properties the Operator shall be immediately notified. Immediate contamination procedures per federal, state, and local requirements shall be implemented by the Contractor. A plan to permanently mitigate the contaminated soil shall be developed by the Contractor and Operator that adheres to all federal, state, and local requirements. The plan shall be implemented by the Contractor.	

5.7 ANY ADDITIONAL BMPS

None.

5.8 ALLOWABLE NON-STORMWATER DISCHARGE MANAGEMENT

Certain non-stormwater discharges are allowed under the Missouri State Operating Permit – General Operating Permit for land disturbance, and it is the intent of this SWPPP to allow such discharges. These types of discharges shall be allowed under the conditions that no pollutants shall be allowed to come in contact with the discharge water prior to or after its discharge. The control measures which have been outlined previously in this SWPPP shall be strictly followed to ensure that no contamination of these non-stormwater discharges takes place. The following allowable non-stormwater discharges which may occur from the job site include:

a) Discharges from firefighting activities
b) Fire hydrant flushing (see note below)
c) Waters used to wash vehicles where detergents are not used
d) Waters used to control dust. Water used in fashion shall only be applied so there is no site runoff.
e) Potable water sources such as waterline flushing (see note below), landscape irrigation, routine exterior building wash down that does not use detergent (see note below)
f) Pavement wash waters where spills or leaks of hazardous materials have not occurred or detergents have not been used
g) Air conditioning condensate
h) Springs and other uncontaminated groundwater, including dewatering ground water infiltration
i) Foundation or footing drains where no contamination with process materials such as solvents is present

NOTE: The Contractor shall neutralize any super-chlorinated water from water distribution pipes before releasing it into the environment. Neutralization techniques are available from the Operator's Engineer.

SECTION 6: INSPECTIONS

6.1 ROUTINE INSPECTIONS

Routine inspections are required at least once every seven (7) calendar days and within 24 hours following a rainfall event that produces runoff. Particular BMP inspection details are included in Sections 4 and 5 of this SWPPP. Written documentation in the form of inspection reports and redlined SWPPP maps must be kept on file with the SWPPP at the jobsite and made available to the Operator, Operator's engineer, USEPA, state and local agencies that have issued land disturbance permits, and any other agency with regulatory authority over stormwater. Inspection report forms are included in Appendix H. In addition, copies of the reports shall be provided by the Contractor to any of these persons, upon request, via mail, email, or facsimile transmission. Also included in Appendix H is a Recommended Inspection Sequence for informational purposes only. Additional inspection requirements are given in the permits in Appendix A.

It is encouraged to take photos during inspections, print them out, and keep them on file with the corresponding inspection report with the onsite SWPPP.

6.2 NON ROUTINE/SPOT INSPECTIONS

High use or high maintenance BMPs (typically construction entrance/exit, street sweeping, trash dumpsters, etc.) should be inspected on a daily basis or as deemed necessary to verify they are functioning properly. Weather reports should be monitored and inspections should take place before large storm events to ensure all BMPs are fully operational before the storm event occurs. Inspect some BMPs during rain events to ensure they are keeping sediment onsite.

6.3 FINAL STABILIZATION

Inspection workload can be reduced by defining certain areas onsite as achieving final stabilization. Final stabilization is defined as when 70% permanent vegetation or permanent materials (buildings, pavement, etc) cover all disturbed areas within the defined area. Once final stabilization is achieved, these areas can me marked on the SWPPP map(s) and inspections can discontinue in these areas only.

6.4 BMP INSPECTORS

A BMP inspection is only as good as the inspector. Therefore it is important that designated inspectors/responsible parties be qualified, trained personnel. Personnel selected to conduct inspections should be knowledgeable in the principles and practices of erosion and sediment controls, possess the technical skills to assess conditions at the construction site that could impact stormwater quality, and assess the effectiveness of any sediment and erosion control measures selected.

6.5 DESIGNATED INSPECTORS

(to be filled in by Contractor after award of contract, make copies of this form as necessary)

Name: _____ Position: _____

Company Name: _____

Company Address: _____

_____

Inspector Cell Phone: _____ Email: _____

Qualifications: _____

Name: _____ Position: _____

Company Name: _____

Company Address: _____

_____

Inspector Cell Phone: _____ Email: _____

Qualifications: _____

_____

_____

Name: _____ Position: _____

Company Name: _____

Company Address: _____

_____

Inspector Cell Phone: _____ Email: _____

Qualifications: _____

_____

_____

Name: _____ Position: _____

Company Name: _____

Company Address: _____

_____

Inspector Cell Phone: _____ Email: _____

Qualifications: _____

_____

SECTION 7: RECORDKEEPING AND TRAINING

7.1 RECORDKEEPING

The following is a list of records you should keep at your project site bound with the SWPPP and available for inspectors to review:

1. Maintain Copies of Permits and Forms, including:
   - ☐ State Land Disturbance Permit (Appendix A)
   - ☐ Local Land Disturbance Permit - if required (Appendix A)
   - ☐ Notice of Intent (NOI)/Land Disturbance Permit Applications (Appendix B)

2. Certification Records, including:
   - ☐ Authorized Representative Designation (Appendix C)
   - ☐ Authorized Representative Certification (Appendix D)
   - ☐ Subcontractors Certification (Appendix F)

3. Maintain Records of Construction Activities, including:
   - ☐ Implementation Schedule (Appendix G)
   - ☐ Dates & locations when major grading activities occur (see below)
   - ☐ Dates when construction activities temporarily cease on a portion of the site (see below)
   - ☐ Dates when construction activities permanently cease on a portion of the site (see below)
   - ☐ Dates when stabilization measures are initiated on the site (see below)
   - ☐ SWPPP maps showing the location and dates of installation of structural and non-structural BMPs (Section 3.13)
   - ☐ SWPPP maps showing the location and dates of installation of good housekeeping BMPs (Section 3.13)
   - ☐ Dates of rainfall and the amount of rainfall (Appendix N)
   - ☐ Records of reports filed with regulatory agencies if reportable quantities of hazardous materials spilled (Appendix M)

4. Maintain Inspection & Maintenance Records, including:
   - ☐ Inspection Reports (Appendix H)
   - ☐ SWPPP Amendment Report Form (Appendix I)
   - ☐ Overall SWPPP Amendment Log (Appendix I)

5. General Required Records, including:
   - ☐ List of Subcontractors (Appendix E)
   - ☐ Record Of Personnel Training Activities Form (Appendix L)
   - ☐ TMDL Documentation (303d Impaired Waterway) (Appendix P)
   - ☐ Endangered Species/Critical Habitat Documentation (Appendix Q)

6. Termination Records, including:
   - ☐ Notice of Termination from state (Appendix O) (if applicable)
   - ☐ Notice of Termination from Local Authority (Appendix O) (if applicable)
   - ☐ Final Stabilization/Termination Checklist (Appendix O)

7. Additional Required Records, including:
   - ☐ _____
   - ☐ _____
   - ☐ _____
   - ☐ _____

Date(s) & location(s) when major grading activities occur: _____

_____

_____

_____

_____

Date(s), location(s), & reason(s) when construction activities temporarily cease on a portion of the site: _____

_____

_____

_____

_____

Date(s) & location(s) when construction activities permanently cease on a portion of the site: _____

_____

_____

_____

_____

Date(s) & area(s) when an area is either temporarily or permanently stabilized (indicate temporary or permanent): __

_____

Upon termination of the land disturbance permit, the Contractor shall turn over all SWPP documentation and maps to the Operator. Inspection and maintenance report forms are to be maintained by the Operator for three years following the final stabilization of the site.

7.2 LOG OF CHANGES TO THE SWPPP

The SWPPP is meant to be a dynamic working guide that is to be kept current, effective, and functional in meeting its objectives at all times. Unforeseen or unexpected circumstances can require modification and amendment to the SWPPP. The SWPPP shall be amended whenever there is a change in design, construction, operation, or maintenance at the construction site that has a significant effect on the discharge of pollutants to the waters of the United States that has not been previously addressed in the SWPPP, if inspections or investigations by site staff, local, state, or federal officials determine that discharges are causing water quality exceedances or the SWPPP is ineffective in eliminating or significantly minimizing pollutants in storm water discharges from the construction site, or based on the results of an inspection, or there is a release containing a Hazardous Substance, or Oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302 occurs during a 24 hour period, the SWPPP shall be modified to include additional or modified BMPs designed to correct identified problems. Revisions shall be completed within seven (7) calendar days following the inspection. Modifications that are the result of inspections shall be initiated within 24 hours and completed within 48 hours. The Contractor shall be responsible for SWPPP modifications/amendments whenever the following occurs:

a) Addition of new BMP(s) or replacement of failing or failed BMP(s).
b) Design, operation, inspection, or maintenance of BMP(s) is changed.
c) Design/scope/schedule of the construction project is changed that could affect the quality of storm water discharges.
d) Updates/revisions to site maps/plans.
e) Inspections indicate deficiencies in the SWPPP or any BMP.
f) Changes in Operator, contractor(s), subcontractor(s) or other personnel.
g) Federal, state, or local authorities notify the Operator/permittee/contractor in writing of deficiencies found onsite regarding stormwater control.
h) SWPPP is determined to be ineffective in significantly minimizing or controlling erosion and sedimentation (e.g., excessive site erosion or excessive sediment deposits downstream of any stormwater outfall, etc.).
i) If Total Settleable Solids (TSS) from a storm water outfall exceed the amount as defined in the operating permit.
j) Federal, state, or local authorities determine violations of Water Quality Standards may occur or have occurred.

Any such changes to the SWPPP must be made in writing and signed and dated by the Contractor's representative. A form has been provided in Appendix I for this purpose. Modifications of the SWPPP BMPs shall be indicated via redlines on the SWPPP maps. The SWPPP must also be amended to identify any new contractor and/or subcontractor that will be responsible for any aspect of the SWPPP. Notification of any modifications or amendments to the SWPPP must be made in writing to both the Operator and the Operator's Engineer within 7 days of the date such modification or amendment is made.

An overall log of SWPPP amendments shall be kept and included with the onsite SWPPP. An amendment log is included in Appendix I.

7.3 TRAINING

Onsite contractor(s), subcontractor(s), and staff might not be familiar with stormwater BMPs, and they might not

understand their role in protecting local rivers, lakes, and coastal waters. Proper training of personnel can be one of the most effective BMPs implemented at a jobsite. The Contractor shall be responsible for basic training of all onsite staff. As with the other steps taken to prevent stormwater problems at the project site, all training conducted for staff, for those with specific stormwater responsibilities, and for subcontractors shall be documented. Training documentation forms are included in Appendix L and shall become an integral part of the onsite SWPPP. Training shall adhere to the following requirements:

Basic training shall educate the attendees on the topics of:

a) An awareness of the SWPPP, its purpose, and the basics of how the purpose is being achieved.
b) Spill prevention and cleanup measures, including prohibition of dumping any material into storm drains or waterways.
c) An understanding of the basic purpose of BMP's, including what BMP's are on site, what they should look like, and how to avoid damaging them.
d) Potential penalties associated with stormwater non compliance.

Entities and subcontractor directly responsible for implementing the SWPPP shall receive comprehensive stormwater training including:

e) The location and type of BMP's being implemented
f) The installation requirements and water quality purpose for each BMP
g) Maintenance procedures for each of the BMP's being implemented
h) Spill prevention and cleanup measures
i) Inspection and maintenance record keeping requirements

Each person working on the site shall be informed of the following:

j) Only designated construction site entrances shall be used for entering and exiting the site
k) Equipment shall be kept away from silt fences, fiber rolls, and other sediment barriers
l) Know the locations of disposal areas, and know the proper practices for trash, concrete and paint washout, hazardous chemicals, etc.
m) Soil, materials, and liquids shall be kept away from paved areas and storm drain inlets. Material shall not be swept or washed into a storm drain
n) Know the location and understand the proper use of spill kits
o) Know the locations of the site's designated protection areas. Equipment shall be kept away from stream banks, valuable trees and shrubs, and steep slopes. Clearly mark these areas
p) Equipment shall be kept off mulched, seeded, or stabilized areas. Clearly mark these areas
q) Know who to contact when problems are identified

SECTION 8: TERMINATION OF PERMIT COVERAGE

Final stabilization is defined by the state Operating Permit – General Operating Permit when perennial vegetation, pavement, buildings, or structures using permanent materials cover all areas that have been disturbed. With respect to areas that have been vegetated, vegetative cover shall be at least 70% of fully established plant density over 100% of the disturbed area. When final stabilization has been achieved over all disturbed areas, and the facility no longer discharges stormwater associated with construction activities, a Final Stabilization/Termination Checklist shall be completed and signed by the Contractor and submitted to the Operator. Once the operator has approved the checklist, the Contractor shall proceed with terminating all land disturbance permits. To terminate the state permit, a Request for Termination of Operating Permit form shall be filed by the Contractor (Appendix O). To terminate the local land disturbance permit, the Contractor shall write a letter to the local authority requesting termination of the permit. The Contractor shall follow up with both the state and local permit authorities to verify the land disturbance permits have been terminated. Verification shall be placed in Appendix O. Termination of all land disturbance permits terminates the Operators and Contractors responsibility to implement the SWPPP.

An Application for Transfer of Operating Permit should be filed when the Operator is no longer the operator of the facility (typically a change of ownership). Once received, the Application and approval letter from the State should be placed in Appendix O of this document. A new MDNR Operating Permit – General Operating Permit should be obtained for the new Operator via the epermitting process described in Section 1. When received, the new General Operating Permit should be placed in Appendix A.

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APPENDIX A

LAND DISTURBANCE PERMIT(S)

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Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

Roseta Elementary School
MORA16148, Boone County
Columbia Public Schools
1818 West Worley Street
COLUMBIA, MO 65203

Enclosed please find your Missouri State Operating Permit which authorizes land disturbance activities for MORA16148. This permit has been issued as requested and is based upon application information entered in the Missouri Department of Natural Resources' (department) ePermitting program. This permit contains several requirements and should be thoroughly read and understood. Please reference General Operating Permit number MORA16148 for future correspondences with the department with regards to this land disturbance activity.

Acquisition of the permit does not imply that the requirements or ordinances of other local, state or federal permits are replaced or superseded. This permit does not authorize land disturbance activity in jurisdictional waters of the United States as defined by the Army Corps of Engineers (Corps), unless the permittee has obtained the required Clean Water Act Section 404 Permit. Not all land disturbance projects will require a 404 permit; however, if a 404 permit is required, land disturbance activities are not to be conducted in the jurisdictional area of the project until the 404 permit has been obtained.

Please contact the applicable Regional Office if you would like to Schedule a Compliance Assistance Visit (CAV). Regional Office contact information is contained with the documents issued with the operating permit. During the visit, department staff will review the requirements of the permit and answer questions pertaining to Land Disturbance activities.

Sincerely,

Water Protection Program

Chris Wieberg

Chris Wieberg
Director

CW

Roseta Elementary School
MORA16148

ePermitting Certification and Signature Document

Missouri State Operating General Permit number MORA16148 was issued on 06-23-2020 based on information entered into the Missouri Department of Natural Resources' electronic Permitting (ePermitting) system. Missouri Regulation 10 CSR 20-6.010(2)(B) requires that all applications for construction and operating permits be signed.

Roseta Elementary School, Boone County
1100 S. Roseta Avenue
COLUMBIA, MO 65201
Total Permitted Area: 4.61 Acres
Total Number of Permitted Features: 1

Based upon the selection you made on the 'New Permit' screen; it was indicated that a single polygon was drawn indicating the entire disturbance area.

Is any part of the area that is being disturbed in a jurisdictional water of the United States? If yes, you must also receive a Clean Water Act, Section 404 Permit for this site from the United States Army Corp of Engineers.
No

I understand there may be an established Local Authority Erosion Control Plan in the city or the unincorporated area of the county where land disturbance activities covered under this general permit will occur. (Note - you may want to contact your local authority to determine if there are any requirements).
Agreed

A Stormwater Pollution Prevention Plan (SWPPP) must be developed for this site. This plan must be developed in accordance with requirements and guidelines specified within the general permit for storm water discharges from land disturbance activities. The application will be considered incomplete if the SWPPP has not been developed.
Agreed

The above certifications were made electronically in the ePermitting system by:
Name: Scott Hanlon
Date: 06/23/2020

I certify that I am familiar with the information contained in the application, that to the best of my knowledge and belief such information is true, complete and accurate, and being granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders and decisions, and terms of this permit, subject to any legitimate appeal available to an applicant under the Missouri Clean Water Commission.
Agreed

Scott Hanlon
Signature

06-23-2020
Date

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

General Operating Permit

In compliance with the Missouri Clean Water Law, (chapter 644 R.S. Mo as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.:	MORA16148
Owner Address:	Columbia Public Schools 1818 West Worley Street COLUMBIA, MO 65203
Continuing Authority:	Columbia Public Schools 1818 West Worley Street COLUMBIA, MO 65203
Facility Name: Facility Address:	Roseta Elementary School 1100 S. Roseta Avenue COLUMBIA, MO 65201
Legal Description: UTM Coordinates: Receiving Stream: First Classified Stream - ID#: USGS# and Sub Watershed#:	Sec. 16, T 48N, R 12W, Boone County 563041.790 / 4310062.229 Tributary to South Fork Grindstone Creek (U) 100K Extent-Remaining Streams (C) 3960.00 10300102 - 0602

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein.

FACILITY DESCRIPTION

All Outfalls - Construction or land disturbance activity (e.g., clearing, grubbing, excavating, grading, filling and other activities that result in the destruction of the root zone and/or land disturbance activity that is reasonably certain to cause pollution to waters of the state).

This permit authorizes only wastewater, including storm water, discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System, it does not apply to other regulated areas. This permit may be appealed in accordance with RSMo Section 644.051.6 and 621.250, 10 CSR 20-6.020, and 10 CSR 20-1.020.

Edward B. Galbraith

06-23-2020
Issue date

Edward B. Galbraith, Director, Division of Environmental Quality

Chris Wieberg

02/07/2022
Expiration date

Chris Wieberg, Director, Water Protection Program

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APPLICABILITY

1. This general permit authorizes the discharge of stormwater and certain non-stormwater discharges from land disturbance sites that disturb one or more acres or disturb less than one acre when part of a larger common plan of development or sale that will disturb a cumulative total of one or more acres over the life of the project. This general permit also authorizes the discharge of stormwater and certain non-stormwater discharges from smaller projects where the Missouri Department of Natural Resources (Department) has exercised its discretion to require a permit [10 CSR 20-6.200 (1)(B)].

   A Missouri State Operating Permit that specifically identifies the project must be issued before any site vegetation is removed or the site disturbed.

   Any site owner/operator subject to these requirements for stormwater discharges and who disturbs land prior to permit issuance from the Department is in violation of both State and Federal Laws.

   The legal owner of the property or the holder of an easement on the property, and operator on which the site is located are responsible for compliance with this permit.

2. This permit authorizes non-stormwater discharges from the following activities provided that these discharges are addressed in the permittee's specific Stormwater Pollution Prevention Plan (SWPPP) required by this general permit:
   a. De-watering activities if there are no contaminants other than sediment present in the discharge, and the discharge is treated as specified in Requirements, Section C.8.m. of this permit;
   b. Flushing water hydrants and potable water lines;
   c. Water only (i.e., without detergents or additives) rinsing of streets and buildings; and
   d. Site watering to establish vegetation.

3. This general permit does not authorize the placement of fill materials in flood plains, the obstruction of stream flow, directing stormwater across private property not owned or operated by the permittee, or changing the channel of a defined drainage course. This general permit addresses only the quality of the stormwater runoff and the minimization of off-site migration of sediments and other water contaminants.

4. This permit does not authorize land disturbance activity in jurisdictional waters of the United States as defined by the U.S. Army Corps of Engineers, unless the permittee has obtained the required Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers and its associated Section 401 Water Quality Certification from the department. Land disturbance activities may not begin in the affected waters of the United States until the required 404 permit and 401 certification have been obtained.

5. This general permit prohibits any discharge of wastewater generated from air pollution control equipment or the containment of scrubber water in lined ponds to waters of the state.

6. This general permit prohibits any discharge of sewage or pollutants to waters of the state including but not limited to:
   a. Any hazardous material, oil, lubricant, solid waste or other non-naturally occurring substance from the site, including fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
   b. Soaps or solvents used in vehicle and equipment washing;
   c. Hazardous substances or petroleum products from an on-site spill or handling and disposal practices;

APPLICABILITY (continued)

d. Wash and/or rinse waters from concrete mixing equipment including ready mix concrete trucks, unless managed by an appropriate control. Any such pollutants must be adequately treated and addressed in the SWPPP, and cannot be discharged to waters of the state;
e. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
f. Domestic wastewaters, including gray waters; or
g. Industrial stormwater runoff.

6. The Department reserves the right to revoke or deny coverage under this general permit to applicants for stormwater discharges from land disturbance activities at sites that have contaminated soils that will be disturbed by the land disturbance activity or where such materials are brought to the site to use as fill or borrow. A site-specific permit may be required to cover such activities.

7. Discharges to waters of the state shall not cause violations of the Water Quality Standards 10 CSR 20-7.031, including both specific and general criteria. If at any time the Department determines that the quality of waters of the state may be better protected by requiring the owner/operator of the permitted site to apply for a site-specific permit, the Department may require any person to obtain a site-specific operating permit [10 CSR 20-6.010(13)(C)].

   The Department may require the permittee to apply for and obtain a site-specific or different general permit if:
   a. The permittee is not in compliance with the conditions of this general permit;
   b. The discharge no longer qualifies for this general permit due to changed site conditions and/or regulations; or
   c. Information becomes available that indicates water quality standards have been or may be violated.

   The permittee will be notified in writing of the requirement to apply for a site-specific permit or a different general permit. When a site-specific permit or different general permit is issued to the authorized permittee, the applicability of this general permit to the permittee is automatically terminated upon the effective date of the site specific or different general permit.

8. Any owner/operator authorized by a general permit may request to be excluded from the coverage of the general permit and apply for a site-specific permit [10 CSR 20-6.010(13) (D)].

9. This operating permit does not affect, remove, or replace any requirement of the National Environmental Policy Act, the Endangered Species Act; the National Historic Preservation Act; the Comprehensive Environmental Response, Compensation and Liability Act; or the Resource Conservation and Recovery Act. Determination of applicability to the above mentioned acts is the responsibility of the permittee.

10. This permit does not supersede any requirement for obtaining project approval under an established local authority.

11. This permit is not transferable to other owners or operators.

EXEMPTIONS FROM PERMIT REQUIREMENTS

1. Facilities that discharge all stormwater runoff directly to a combined sewer system are exempt from stormwater permit requirements.

2. Land disturbance activity as described in 10 CSR 20-6.200(1) (B) and 10 CSR 20-6.010(1) (B) where water quality standards are not exceeded.

3. Oil and gas related activities as listed in 40 C.F.R § 122.26(a) (2) (ii) where water quality standards are not exceeded.

REQUIREMENTS

1. This permit is to ensure the design, installation and maintenance of effective erosion and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed and maintained to:
   a. Control stormwater volume and velocity within the site to minimize soil erosion;
   b. Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion;
   c. Minimize the amount of soil exposed during construction activity;
   d. Minimize the disturbance of steep slopes;
   e. Minimize sediment discharges from the site. Design, install and maintain erosion and sediment controls that address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle size expected to be present on the site;
   f. Provide and maintain natural buffers around surface waters as detailed in 8.f, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration and filtering, unless infeasible; and
   g. Minimize soil compaction and, unless infeasible, preserve topsoil.
   h. Capture or treat a 2-year, 24-hour storm event. A 2-year, 24-hour storm event shall be determined for the project location using the National Oceanic and Atmospheric Administration's National Weather Service Atlas 14 which can be located at http://hdsc.nws.noaa.gov/hdsc/pfds/.

2. Installation of Best Management Practices (BMP) necessary to prevent soil erosion at the project boundary must be complete prior to the start of all phases of construction.

3. Install sediment controls along any perimeter areas of the site that will receive pollutant discharges.
   a. Remove any sediment per the manufacturer's instructions or before it has accumulated to one-half of the above-ground height of any perimeter control.
   b. For sites where perimeter controls are infeasible, other practices shall be implemented to minimize discharges to perimeter areas of the site.

4. BMPs shall be maintained and remain in effective operating condition during the entire duration of the project, with repairs made within the timeframe specified elsewhere in this permit, until final stabilization has been achieved.

5. Minimize sediment trackout from the site.
   a. Restrict vehicle traffic to properly designed exit points.
   b. Use appropriate stabilization techniques at all points that exit onto paved roads.
   c. Remove any sediment that has been tracked out within the same business day or by the end of the next business day if trackout occurs on a non-business day.

REQUIREMENTS (continued)

6. The primary requirement of this permit is the development and implementation of a SWPPP which incorporates site specific practices to best minimize the soil exposure, soil erosion, and the discharge of pollutants. The permittee shall fully implement the provisions of the SWPPP required under this part as a condition of this general permit throughout the term of the land disturbance project. **The SWPPP must be developed prior to issuance of the permit and must be specific to the land disturbance activities at the site.** A permit must be issued before any disturbance of root zone of the existing vegetation or other land disturbance activities may begin. Either an electronic copy or a paper copy of the SWPPP must be accessible to anyone on-site at all times when land disturbance operations are in progress, or other operational activities that may affect the maintenance or integrity of the BMP structures and made available made available as specified under the Records Section of this permit.

7. The SWPPP must:
   a. List and describe all outfalls;
   b. Incorporate required practices identified below;
   c. Incorporate erosion control practices specific to site conditions;
   d. Provide for maintenance and adherence to the plan;
   e. Discuss whether or not a 404/401 Permit is required for the project; and
   f. Name the person responsible for inspection, operation and maintenance of BMPs.

   The purpose of the SWPPP is to ensure the design, implementation, management and maintenance of BMPs in order to prevent sediment and other pollutants in stormwater discharges associated with the land disturbance activities; compliance with the Missouri Water Quality Standards; and compliance with the terms and conditions of this general permit.

   The permittee shall select, install, use, operate and maintain appropriate BMPs for the permitted site. The following manuals are acceptable resources for the selection of appropriate BMPs. *Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites*, (Document number EPA 833-R-06-004) published by the United States Environmental Protection Agency (USEPA) in May 2007. This manual as well as other information, including examples of construction SWPPPs, is available at the USEPA internet site at https://www3.epa.gov/npdes/pubs/industrial_swppp_guide.pdf; and

   The latest version of *Protecting Water Quality: A field guide to erosion, sediment and stormwater best management practices for development sites in Missouri,* published by the Missouri Department of Natural Resources. This manual is available on the Department's internet site at: http://www.dnr.mo.gov/env/wpp/wpcp-guide.htm.

   The permittee is not limited to the use of these guidance manuals. Other guidance publications may be used to select appropriate BMPs. However, all BMPs should be described and justified in the SWPPP.

8. SWPPP Requirements: The following information and practices shall be provided for in the SWPPP:
   a. Nature of the Construction Activity: The SWPPP briefly must describe the nature of the construction activity, including:
      1) The function of the project (e.g., low density residential, shopping mall, highway, etc.);
      2) The intended sequence and timing of activities that disturb the soils at the site;
      3) Estimates of the total area expected to be disturbed by excavation, grading, or other construction activities including off-site borrow and fill areas; and
      4) A general map (e.g., United States Geological Survey quadrangle map, a portion of a city of county map, or other map) with enough detail to identify the location of the construction site and waters of the State within one mile of the site.

REQUIREMENTS (continued)

b. Site Map: The SWPPP must contain a legible site map showing the site boundaries and outfalls and identifying:
   1) Direction(s) of stormwater flow and approximate slopes anticipated after grading activities;
   2) Areas of soil disturbance and areas that will not be disturbed (or a statement that all areas of the site will be disturbed unless otherwise noted);
   3) Location of major structural and non-structural BMPs identified in the SWPPP;
   4) Locations where stabilization practices are expected to occur;
   5) Locations of off-site material, waste, borrow or equipment storage areas;
   6) Locations of all waters of the state (including wetlands);
   7) Locations where stormwater discharges to a surface water; and
   8) Areas where final stabilization has been accomplished and no further construction-phase permit requirements apply.

c. Site Description: In order to identify the site, the SWPPP shall include facility and outfall information. The SWPPP shall have sufficient information to be of practical use to contractors and site construction workers to guide the installation and maintenance of BMPs.

d. Selection of Temporary and Permanent BMPs: The permittee shall select appropriate BMPs for use at the site and list them in the SWPPP.

e. The SWPPP shall require existing vegetation and trees to be preserved where practical.

f. For surface waters of the state, defined as "all waters within the jurisdiction of this state, including all rivers, streams, lakes and other bodies of surface and subsurface water lying within or forming a part of the boundaries of the state which are not entirely confined and located completely upon lands owned, leased or otherwise controlled by a single person or by two or more persons jointly or as tenants in common, located on or adjacent to the site, the permittee must:
   1) Provide and maintain a 50-foot undisturbed natural buffer;
   2) Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or
   3) If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.
   4) Where you are retaining a buffer of any size, the buffer should be measured perpendicularly from any of the following points, whichever is further landward from the water:
      i. The ordinary high water mark of the water body, defined as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris; or
      ii. The edge of the stream or river bank, bluff, or cliff, whichever is applicable.

g. Description of BMPs: The SWPPP shall include a description of both structural and non-structural BMPs that will be used at the site.

   The SWPPP shall provide the following general information for each BMP which will be used one or more times at the site:
   1) Physical description of the BMP;
   2) Site conditions that must be met for effective use of the BMP;
   3) BMP installation/construction procedures, including typical drawings; and
   4) Operation and maintenance procedures for the BMP.

REQUIREMENTS (continued)

The SWPPP shall provide the following information for each specific instance where a BMP is to be installed:

1) Whether the BMP is temporary or permanent;
2) Where, in relation to other site features, the BMP is to be located;
3) When the BMP will be installed in relation to each phase of the land disturbance procedures to complete the project; and
4) Site conditions that must be met before removal of the BMP if the BMP is not a permanent BMP.

h. Disturbed Areas: Slopes for disturbed areas must be defined in the SWPPP. A site map or maps defining the sloped areas for all phases of the project must be included in the SWPPP.

For soil disturbing activities that have been temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days:

1) The permittee shall construct BMPs to establish interim stabilization; and
2) Stabilization must be initiated immediately and completed within 14 calendar days.

For soil disturbing activities that have been permanently ceased on any portion of the site, final stabilization of disturbed areas must be initiated immediately and completed within 14 calendar days.

Allowances to the 14 day completion period for temporary and final stabilization may be made due to weather and equipment malfunctions. The use of allowances shall be documented in the SWPPP.

Interim stabilization shall consist of well-established and maintained BMPs that are reasonably certain to protect waters of the state from sediment pollution over an extended period of time. This may require adding more BMPs to an area than is normally used during daily operations. These BMPs may include a combination of sediment basins, check dams, sediment fences and mulch. The types of BMPs used must be suited to the area disturbed, taking into account the number of acres exposed and the steepness of the slopes. If the slope of the area is greater than 3:1 (three feet horizontal to one foot vertical) or if the slope is greater than 3% and greater than 150 feet in length, then the permittee shall establish interim stabilization within seven days of ceasing operations on that part of the site.

If vegetative stabilization measures are being implemented, stabilization is considered "installed" when all activities necessary to seed or plant the area are completed.

i. Installation: The permittee shall ensure the BMPs are properly installed at the locations and relative times specified in the SWPPP. Peripheral or border BMPs to control runoff from disturbed areas shall be installed or marked for preservation before general site clearing is started. Note that this requirement does not apply to earth disturbances related to initial site clearing and establishing entry, exit and access of the site, which may require that stormwater controls be installed immediately after the earth disturbance. For phased projects, BMPs shall be properly installed as necessary prior to construction activities. Stormwater discharges from disturbed areas which leave the site shall pass through an appropriate impediment to sediment movement such as a sedimentation basin, sediment traps and silt fences prior to leaving the land disturbance site. A drainage course change shall be clearly marked on a site map and described in the SWPPP.

j. Sedimentation Basins: The SWPPP shall include a sedimentation basin for each drainage area with ten or more acres disturbed at one time. The sedimentation basin shall be sized to treat a local 2-year, 24-hour storm. Accumulated sediment shall be removed from the basin when basin is 50% full. Utilize outlet structures that withdraw water from the surface when

REQUIREMENTS (continued)

discharging from basins and impoundments unless infeasible. Discharges from the basin shall not cause scouring of the banks or bottom of the receiving stream. The SWPPP shall require the basin be maintained until final stabilization of the disturbed area served by the basin.

Where use of a sediment basin is infeasible, the SWPPP shall evaluate and specify other similarly effective BMPs to be employed to control erosion and sediment delivery. These similarly effective BMPs shall be selected from appropriate BMP guidance documents authorized by this permit. The BMPs must provide equivalent water quality protection to achieve compliance with this permit. The SWPPP shall require both temporary and permanent sedimentation basins to have a stabilized spillway to minimize the potential for erosion of the spillway or basin embankment.

k. Pollution Prevention Measures: The SWPPP shall include BMPs for pollution prevention measures. At minimum such measures must be designed, installed, implemented and maintained to:
   1) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
   2) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to precipitation and to stormwater;
   3) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures. Included but not limited to the installation of containment berms and use of drip pans at petroleum product and liquid storage tanks and containers; and
   4) Prevent discharges from causing or contributing to an exceedance of water quality standards including general criteria.

l. Roadways: Where applicable, upon installation of or connection to roadways, all efforts should be made to prevent the deposition of earth and sediment onto roadways through the use of proper BMPs. Stormwater inlets susceptible to receiving sediment from the permitted land disturbance site shall have curb inlet protection. Where stormwater will flow off the end of where a roadway terminates, a sediment catching BMP such as gravel berm or silt fence shall be provided. Curb inlets shall be cleaned weekly or following a rainfall that generates a run-off.

m. Dewatering: Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls. The SWPPP shall include a description of any anticipated dewatering methods. An estimation of the volume of water discharged from these dewatering activities shall be kept with the SWPPP after each discharge has ended along with the type and maximum capacity (e.g., flow rate) of equipment used. The SWPPP shall call for specific BMPs designed to treat water pumped from trenches and excavations and in no case shall this water be pumped off-site without being treated by the specified BMPs.

9. Good housekeeping practices shall be maintained at all times to keep waste from entering waters of the state. Solid and hazardous waste management include providing trash containers and regular site cleanup for proper disposal of solid waste such as scrap building material, product/material shipping waste, food containers and cups, and providing containers and proper disposal of waste paints, solvents and cleaning compounds. The provision of portable toilets for proper disposal of sanitary sewage and the storage of construction materials should be kept away from drainage courses and low areas.

REQUIREMENTS (continued)

10. All fueling facilities present shall at all times adhere to applicable federal and state regulations concerning underground storage, above ground storage and dispensers.

11. Hazardous wastes that are transported, stored, or used for maintenance, cleaning, or repair shall be managed according to the provisions of the Missouri Hazardous Waste Laws and Regulations.

12. All paint, solvents, petroleum products, petroleum waste products and storage containers such as drums, cans, or cartons shall be stored according to BMPs. The materials exposed to precipitation shall be stored in watertight, structurally sound, closed containers. All containers shall be inspected for leaks or spillage during the inspection of BMPs.

13. Amending/Updating the SWPPP: The permittee shall amend and update the SWPPP as appropriate during the term of the land disturbance activity. The permittee shall amend the SWPPP at a minimum whenever the:
    a. Design, operation, or maintenance of BMPs is changed;
    b. Design of the construction project is changed that could significantly affect the quality of the stormwater discharges;
    c. Permittee's inspections indicate deficiencies in the SWPPP or any BMP;
    d. Department notifies the permittee in writing of deficiencies in the SWPPP;
    e. SWPPP is determined to be ineffective in minimizing or controlling erosion and sedimentation (e.g., there is visual evidence of excessive site erosion or excessive sediment deposits in streams or lakes); and/or
    f. Department determines violations of water quality standards may occur or have occurred.

14. An individual shall be designated by the permittee as the lead for environmental matters. The lead individual for environmental matters shall have a thorough and demonstrable knowledge of the site's SWPPP and sediment and erosion control practices in general. The lead individual for environmental matters or a designated inspector knowledgeable in erosion, sediment and stormwater control principles shall inspect all structures that function to prevent pollution of waters of the state.

15. Site Inspections Reports: The permittee (or a representative of the permittee) shall conduct regularly scheduled inspections. These inspections shall be conducted by a qualified person, one who is responsible for environmental matters at the site, or a person trained by and directly supervised by the person responsible for environmental matters at the site. For disturbed areas that have not been finally stabilized, all installed BMPs and other pollution control measures shall be inspected for proper installation, operation and maintenance. All stormwater outfalls shall be inspected for evidence of erosion or sediment deposition. When practicable the receiving stream shall also be inspected for 50 feet downstream of the outfall. Any structural or maintenance problems shall be noted in an inspection report and corrected as soon as possible but no more than seven calendar days after the inspection. All BMPs must be inspected in accordance to one of the two schedules listed below, and any changes to the frequency of inspections, including switching between the options listed below, must be documented in the SWPPP:
    a. At least once every seven calendar days and within 48 hours after any storm event equal to or greater than a 2-year, 24-hour storm has ceased during a normal work day and within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday; or
    b. Once every 14 calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches of precipitation or greater, or the occurrence of runoff from snowmelt. To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on site, or obtain the storm event information from a weather station for your location.
        1) Inspections are only required during the project's normal working hours.

REQUIREMENTS (continued)

2) You must conduct an inspection within 24 hours once a storm event has produced 0.25 inches within a 24 hour period, even if the storm event is still continuing.
3) If you have elected to inspect every 14 calendar days and there is a storm event at your site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, you are required to conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm.

The SWPPP must explain how the person responsible for erosion control will be notified when stormwater runoff occurs. If weather conditions prevent correction of BMPs within seven calendar days, the reasons for the delay must be documented (including pictures) and there must be a narrative explaining why the work cannot be accomplished within the seven day time period. The documentation must be filed with the regular inspection reports. The permittee shall correct the problem as soon as weather conditions allow. Areas on-site that have been finally stabilized must be inspected at least once per month.

A log of each inspection and copy of the inspection report shall be kept readily accessible and must be available upon request by the Department. Electronic logs are acceptable as long as reports can be provided in a timely manner. If inspection reports are kept off-site, your SWPPP must indicate where they are stored. The inspection report shall be signed by the permittee or by the person performing the inspection if duly authorized to do so. The inspection report is to include the following minimum information:

a. Inspector's name;
b. Date of inspection;
c. Observations relative to the effectiveness of the BMPs;
d. Actions taken or necessary to correct the observed problem; and
e. Listing of areas where land disturbance operations have permanently or temporarily stopped.

16. Notification to All Contractors: The permittee shall be responsible for notifying each contractor or entity (including utility crews and city employees or their agents) who will perform work at the site of the existence of the SWPPP and what action or precautions shall be taken while on-site to minimize the potential for erosion and the potential for damaging any BMP. The permittee is responsible for any damage a subcontractor may do to established BMPs and any subsequent water quality violation resulting from the damage.

17. Public Notification: The permittee shall post a copy of the public notification sign described by the Department at the main entrance to the site. The public notification sign must be visible from the public road that provides access to the site's main entrance. An alternate location is acceptable provided the public can see it and it is noted in the SWPPP. The public notification sign must remain posted at the site until the permit has been terminated.

OTHER DISCHARGES

1. Release of a hazardous substance must be reported to the department in accordance with 10 CSR 24-3.010. A record of each reportable spill shall be retained with the Stormwater Pollution Prevention Plan (SWPPP) and made available to the department upon request. The department may also require the submittal of a written or electronic report detailing measures taken to clean up the spill within five (5) days of the spill. Such a report must include the type of material spilled, volume, date of spill, date clean-up was completed, clean-up method, and final disposal method. If the spill occurs outside of normal business hours, or if the permit holder cannot reach regional office staff for any reason, the permit holder is instructed to report the spill to the department's 24 hour Environmental Emergency Response hotline at (573) 634-2436 at the earliest practicable moment after discovery. Leaving a message on a department staff member voice-mail does not satisfy this reporting requirement.

REQUIREMENTS (continued)

2. Removed substances: Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

SAMPLING REQUIREMENTS AND EFFLUENT LIMITATIONS

The Department may require sampling and reporting as a result of illegal discharges, compliance issues, complaint investigations, or other such evidence of contamination from activities at the site. If such an action is needed, the Department will specify in writing any sampling requirements, including such information as location, extent and parameters.

RECORDS

1. The permittee shall retain copies of this general permit, the SWPPP and all amendments for the site named in the State Operating Permit, results of any monitoring and analysis and all site inspection records required by this general permit. The records shall be accessible during normal business hours. The records shall be retained for a period of at least three years from the date of the Letter of Termination.

2. The permittee shall provide a copy of the SWPPP to the Department, USEPA, or any local agency or government representative if they request a copy in the performance of their official duties.

3. The permittee shall provide a copy of the SWPPP to those who are responsible for installation, operation, or maintenance of any BMP. The permittee, their representative, and/or the contractor(s) responsible for installation, operation and maintenance of the BMPs shall have a current copy of the SWPPP with them when on the project site.

LAND PURCHASE AND CHANGE OF OWNERSHIP

1. Federal and Missouri stormwater regulations [10 CSR 20-6.200(1) (B)] require a stormwater permit and erosion control measures for all land disturbances of one or more acres. These regulations also require a permit for less than one acre lots if the lot is part of a larger common plan of development or sale where that plan is at least one acre in size.

2. If the permittee sells any portion of the permitted site to a developer for commercial, industrial, or residential use, this land remains a part of the common sale and the new owner must obtain a permit prior to conducting any land disturbance activity. Therefore, the original permittee must amend the SWPPP to show that the property has been sold and therefore no longer under the original permit coverage.

3. Property of any size which is part of a larger common plan of development where the property has been stabilized and the original permit terminated will require application of a new land disturbance permit for any future land disturbance activity.

4. If the entire tract is sold to a single entity, then this permit shall be terminated when the new owner obtains a new land disturbance permit for the site.

5. If a portion of a larger common plan of development is sold to an individual for the purpose of building his or her own private residence, a permit is required if the portion of land sold is equal to or greater than one acre while no permit is required for less than one acre of land sold.

TERMINATION

1. This permit may be terminated when the project is stabilized. The project is considered to be stabilized when perennial vegetation, pavement, buildings, or structures using permanent materials cover all areas that have been disturbed. With respect to areas that have been vegetated, vegetation cover shall be at least 70% over 100% of the site. In order to terminate the permit, the permittee shall notify the Department by submitting Form H Request for Termination of a General Permit.

2. The Cover Page (Certificate Page) of the Master General Permit for Land Disturbance specifies the "effective date" and the "expiration date" of the Master General Permit. The "issued date" along with the "expiration date" will appear on the State Operating Permit issued to the applicant. This permit does not continue administratively beyond the expiration date.

3. Due to the nature of the electronic permitting system, a period of 60 days will be granted at the discretion of the department in order to apply for a new permit after the new version is effective. Applicants must maintain appropriate best management practices during the discretionary period.

DUTY TO REAPPLY

If the project or development completion date will be after the expiration date of this general permit, then the permittee must reapply to the Department for a new permit. This permit may be applied for and issued electronically once made available by the director in accordance with Section 644.051.10, RSMo.

MODIFICATION, REVOCATION, AND REOPENING

1. If at any time the Department determines that the quality of waters of the state may be better protected by reopening this permit, or revoking this permit and requiring the owner/operator of the permitted site to apply for a site-specific permit, the Department may revoke a general permit and require any person to obtain such an operating permit as authorized by 10 CSR 20-6.010(13) and 10 CSR 20-6.200(1) (B).

2. If this permit is reopened, modified or revoked pursuant to this Section, the permittee retains all rights under Chapter 536 and 644 Revised Statutes of Missouri upon the Department's reissuance of the permit as well as all other forms of administrative, judicial, and equitable relief available under law.

STANDARD CONDITIONS

These Standard Conditions incorporate permit conditions as required by 40 CFR 122.41 or other applicable state statutes or regulations. These minimum conditions apply unless superseded by requirements specified in the permit.

1. Other Information
   a. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

2. Duty to Comply
   a. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Missouri Clean Water Law and Federal Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

STANDARD CONDITIONS (continued)

3. Duty to Provide Information
   a. The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.

4. Inspection and Entry
   a. The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department), upon presentation of credentials and other documents as may be required by law, to:
      i. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
      ii. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
      iii. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
      iv. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Federal Clean Water Act or Missouri Clean Water Law, any substances or parameters at any location.

5. Signatory Requirement
   a. All permit applications, reports required by the permit, or information requested by the Department shall be signed and certified. (See 40 CFR 122.22 and 10 CSR 20-6.010)
   b. The Federal Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six (6) months per violation, or by both.
   c. The Missouri Clean Water Law provides that any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than ten thousand dollars, or by imprisonment for not more than six months, or by both.

Missouri Department of Natural Resources
Fact Sheet
MO-RA00000

The Federal Water Pollution Control Act [Clean Water Act (CWA)] Section 402 of Public Law 92-500 (as amended) established the National Pollution Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States, and the release of stormwater from certain point sources. All such discharges are unlawful without a permit (Section 301 of the CWA). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Missouri State Operating Permits (permit) are issued by the Missouri Department of Natural Resources (department) under an approved program, operated in accordance with federal and state laws (Federal CWA and Missouri Clean Water Law Section 644 as amended). Permits are issued for a period of five (5) years unless otherwise specified.

Per 40 CFR 124.56, 40 CFR124.8, and 10 CSR 20-6.020(1)(A)2., a Fact Sheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the permit. A Fact Sheet is not an enforceable part of an MSOP.

This Fact Sheet is for a:

- ☐ Major
- ☐ Minor
- ☐ Industrial Facility
- ☐ Variance
- ☒ Master General Permit
- ☐ Permit with widespread public interest

Definitions

Common Promotional Plan: A plan undertaken by one (1) or more persons, to offer lots for sale or lease; where land is offered for sale by a person or group of persons acting in concert, and the land is contiguous or is known, designated or advertised as a common unit or by a common name or similar names, the land is presumed, without regard to the number of lots covered by each individual offering, as being offered for sale or lease as part of a common promotional plan.

Immediately: For the purposes of this permit, immediately should be defined as within 24 hours.

Infeasible: Infeasible means not technologically possible, or not economically practicable and achievable in light of best industry practices.

Larger Common Plan of Development or sale: A contiguous area where multiple separate and distinct construction activities are occurring under one plan.

Ordinary High Water Mark: The line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation and/or the presence of litter and debris.

Peripheral: For the purposes of this permit, peripheral should be defined as the outermost boundary of the area that will be disturbed.

Permanently: For the purposes of this permit, permanently should be defined as any activity that has been ceased without any intentions of future disturbance.

Waters of the state: Section 644.016.1(27) RSMo. defines waters of the state as, "All waters within the jurisdiction of this state, including all rivers, streams, lakes and other bodies of surface and subsurface water lying within or forming a part of the boundaries of the state which are not entirely confined and located completely upon lands owned, leased or otherwise controlled by a single person or by two or more persons jointly or as tenants in common."

Part I – Facility Information

Facility Type:	Industrial Stormwater
Facility Description:	Construction or land disturbance activity (e.g., clearing, grubbing, excavating, grading, filling, and other activities that result in the destruction of the root zone and/or land disturbance activity that is reasonably certain to cause pollution to waters of the state).

This permit establishes a SWPPP requirement to minimize pollutants of concern from this type of facility or for all facilities covered under this permit. 10 CSR 20-6.200(6)(A)7. specifies that "general permits shall contain BMP requirements and/or monitoring and reporting requirements to keep the stormwater from becoming contaminated." Local conditions are not considered when developing conditions for a general permit. A facility may apply for a site-specific permit if they desire a review of site-specific conditions.

While drafting this permit for renewal, the department hosted four public meetings held on January 27, February 24, April 18, and May 19, 2016, which allowed stakeholders to voice concerns about conditions within the permit and submit comments during the period of initial stakeholder involvement. These concerns were taken into consideration when drafting the permit. In addition to these meetings, the department also held an informal review period for stakeholders to review the draft prior to the 30 day public comment period.

Part II – Receiving Stream Information

APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:
Per Missouri Effluent Regulations (10 CSR 20-7.015), the waters of the state are divided into seven (7) categories. This permit applies to facilities discharging to the following water body categories:

Please mark all appropriate designated waters of the state categories of the receiving stream.

- ☒ Missouri or Mississippi River [10 CSR 20-7.015(2)]
- ☒ Lakes or Reservoirs [10 CSR 20-7.015(3)]
- ☒ Losing Streams [10 CSR 20-7.015(4)]
- ☒ Metropolitan No-Discharge Streams [10 CSR 20-7.015(5)]
- ☒ Special Streams [10 CSR 20-7.015(6)]
- ☐ Subsurface Waters [10 CSR 20-7.015(7)]
- ☒ All Other Waters [10 CSR 20-7.015(8)]

Missouri Water Quality Standards (10 CSR 20-7.031) defines the Clean Water Commission water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and/or 1st classified receiving stream's beneficial water uses shall be maintained in accordance with 10 CSR 20-7.031(4). The BMP requirement established by this permit are intended to be protective of all streams that fall within the categories of receiving water bodies indicated above. A general permit does not take into consideration site-specific conditions.

Part III – Applicability

Condition number 8 was expanded to include a more comprehensive list of state and federal requirements that must be taken into consideration.

If the proposed project encounters and will potentially affect a species of concern, please report it to the Missouri Department of Conservation and the United States Fish and Wildlife Service. For more information about requirements of the Endangered Species Act, please visit the following links:

1. To determine the potential for species of concern within or near a project, please visit the United States Fish and Wildlife Services' "Information, Planning and Conservation" website at http://ecos.fws.gov/ipac/.
2. If there are listed species in the county or township, check to see if critical habitat has been designated and if that area overlaps or is near the project area. Critical habitat designations and associated requirements may also be found at 50 CFR Parts 17 and 226. For additional information, use the map view tool at http://criticalhabitat.fws.gov/crithab/ to find data specific to your state and county.

The Missouri Department of Conservation's internet site for the Natural Heritage Review may be very helpful and can be found at the following link,
http://mdcgis.mdc.mo.gov/heritage/newheritage/heritage.htm.

Part IV – Exemptions

Condition Number 2 was added to cite all state exemptions from permitting requirements, combining several previous cited exemptions into one condition and reference. This includes an exemption for linear construction where the entire disturbance, including clearing of land to access the linear disturbance, is less than two feet in width.

Condition Number 3 was added to cite federal regulations that exclude land disturbance projects as related to the installation or maintenance work for oil and gas related activities.

Part V – Rationale of Technology Based Limitations & Permit Conditions

303(d) LIST & TOTAL MAXIMUM DAILY LOAD (TMDL):
Section 303(d) of the Federal CWA requires that each state identify waters that are not meeting Water Quality Standards and for which adequate water pollution controls have not been required. Water Quality Standards protect such beneficial uses of water as whole body contact, maintaining fish and other aquatic life, and providing drinking water for people, livestock, and wildlife. The 303(d) list helps state and federal agencies keep track of waters that are impaired but not addressed by normal water pollution control programs.

ANTI-BACKSLIDING:
A provision in the Federal Regulations [CWA Section 303(d) (4); CWA Section 402(c); 40 CFR Part 122.44(I)] that requires a reissued permit to be as stringent as the previous permit with some exceptions.

☒ Applicable: Backsliding proposed in this permit conforms to the anti-backsliding provisions of Section 402(o) of the CWA and 40 CFR 122.44. The department has determined that technical mistakes were made in the previous permit [CWA 402(o)(2)(B)(ii)]. The Settleable Solids limitation was removed since has been determined to not be adequate in protecting water quality in all areas of the state. Increased technology based best management practices will protect water quality at a similar if not more protective level.

ANTIDEGRADATION:
Antidegradation policies ensure protection of water quality for a particular water body on a pollutant by pollutant basis to ensure Water Quality Standards are maintained to support beneficial uses such as fish and wildlife propagation and recreation on and in the water. This also includes special protection of waters designated as an Outstanding National Resource Water or Outstanding State Resource Water [10 CSR 20-7.031(3) (C)]. Antidegradation policies are adopted to minimize adverse effects on water. The department has determined that the best avenue forward for implementing the Antidegradation requirements into general permits is by requiring the appropriate development and maintenance of a SWPPP. The SWPPP must identify all Best Management Practices (BMPs) that are reasonable and effective, taking into account environmental impacts and costs. This analysis must document why no discharge or no exposure options are not feasible at the facility. This selection and documentation of appropriate control measures will then serve as the analysis of alternatives and fulfill the requirements of the Antidegradation Rule and Implementation Procedure 10 CSR 20-7.031(3) and 10 CSR 20-7.015(9)(A)5.

Any facility seeking coverage under this permit, which undergoes expansion or discharges a new pollutant of concern, must update their SWPPP and select new BMPs that are reasonable and cost effective. New facilities seeking coverage under this permit are required to develop a SWPPP that includes this analysis and documentation of appropriate BMPs. Renewal of coverage for a facility requires a review of the SWPPP to assure that the selected BMPs continue to be appropriate.

☒ Applicable: The main pollutant of concern in this permit is sediment. Compliance with the technology based limitations established in this permit for the protection of General Criteria, along with the evaluation and implementation of BMPs as documented in the SWPPP, meets the requirements of Missouri's Antidegradation Review [10 CSR 20-7.031(3), 10 CSR 20-7.031 Table A, and 10 CSR 20-7.015(9)(A)5].

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):
In accordance with 40 CFR 122.44(3)(k) Best Management Practices (BMPs), BMPs are implemented to control or abate the discharge of pollutants when: (1) Authorized under Section 304(e) of the CWA for the control of toxic pollutants and hazardous substances from ancillary industrial activities: (2) Authorized under Section 402(p) of the CWA for the control of stormwater discharges; (3) Numeric effluent limitations are infeasible; or (4) The practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

In accordance with Developing Your Stormwater Pollution Prevention Plan, a Guide for Construction Sites (EPA 833-R-06-004; https://www3.epa.gov/npdes/pubs/sw_swppp_guide.pdf) published by the United States Environmental Protection Agency (EPA) in May 2007, BMPs are measures or practices used to reduce the amount of pollution entering waters of the state. BMPs may take the form of a process, activity, or physical structure. EPA developed resources and tools related to construction stormwater along with the BMPs to control and minimize stormwater (https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources). Along with EPA's resources and tools, the International Stormwater BMP database (www.bmpdatabase.org/index.htm) may provide guidance on BMPs appropriate for specific industries.

Additionally in accordance with Stormwater Management, a SWPPP is a series of steps and activities to (1) identify sources of pollution or contamination, and (2) select and carry out actions which prevent or control the pollution of stormwater discharges.

☒ Applicable: A SWPPP shall be developed and implemented for each site and shall incorporate required practices identified by the department with jurisdiction, incorporate erosion control practices specific to site conditions, and provide for maintenance and adherence to the plan.

The new permit has been revised to allow permittees to store SWPPP documents electronically as long as they can be provided in an expedient manner.

WATER QUALITY STANDARDS:
Per 10 CSR 20-7.031(4), General Criteria shall be applicable to all waters of the state at all times, including mixing zones. Additionally, 40 CFR 122.44(d)(1) directs the department to include in each NPDES permit conditions to achieve water quality established under Section 303 of the CWA, including state narrative criteria for water quality.

General Criteria. The following water quality criteria shall be applicable to all waters of the state at all times. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:

(1) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits, or prevent full maintenance of beneficial uses;
(2) Waters shall be free from oil, scum, and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
(3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor, or prevent full maintenance of beneficial uses;
(4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal, or aquatic life;
(5) There shall be no significant human health hazard from incidental contact with the water;
(6) There shall be no acute toxicity to livestock or wildlife watering;
(7) Waters shall be free from physical, chemical, or hydrologic changes that would impair the natural biological community;
(8) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment, and solid waste as defined in Missouri Solid Waste Law, Section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to Section 260.200-260.247, RSMo.

The settelable solids requirement was removed from this permit and was replaced with additional, more specific, BMP requirements. The settelable solids limit was determined not to be protective of all waters across the state, therefore, it was removed.

Additional BMPs added to the permit will provide for more consistency across the state. Examples of these BMPs include requirements to:

- Install and maintain perimeter controls along areas of the site that will receive pollutant discharges;
- Minimize sediment trackout from the site;
- Capture or treat runoff up to and including a 2-year, 24-hour storm event; and
- Direct stormwater to vegetated areas.

The minimum buffer width was increased from 25 feet to 50 feet. Studies have shown that a 50 foot vegetative buffer more adequately treats sediment from stormwater discharges. This appears to be standard in EPA's permit as well as in many other states.

In order to design controls that match the sediment removal efficiency of a 50- foot buffer, first you must know what this efficiency is for your site. The sediment removal efficiencies of natural buffers vary according to a number of site-specific factors, including precipitation, soil type, land cover, slope length, width, steepness, and the types of sediment controls used to reduce the discharge of sediment prior to the buffer.

Sediment removal efficiencies are based on the U.S. Department of Agriculture's RUSLE2 (Revised Universal Soil Loss Equation 2) model for slope profiles using a 100-foot long exposed slopes.

Sediment removal is defined as the annual sediment delivered at the downstream end of the 50-foot natural buffer (tons/yr/acre) divided by the annual yield from cleared area (tons/yr/acre).

Sediment removal is in part a function of (1) a perimeter control (i.e., silt fence) located between the disturbed portion of the site and the upland edge of the natural buffer and (2) stormwater flows traveling through a 50-foot buffer of undisturbed natural vegetation.

Additional guidance may be found at https://www.epa.gov/sites/production/files/2015-10/documents/cgp2012_appendixg.pdf.

Inspection frequencies: Site inspection frequencies have been changed from the previous permit based upon guidance from the US EPA and from stakeholder discussions. These frequencies will allow flexibility but will still allow for frequent enough inspections to ensure that all BMPs are adequately functioning.

Part VI – Effluent Limitations Determination

In this general permit, Technology-Based Effluent Limitations are established through the SWPPP and BMP requirements. Effective BMPs may have to be designed on a site-specific basis. The concurrent implementation of monitoring and benchmarks provides a tool for each facility to evaluate the effectiveness of BMPs to ensure protection of water quality.

Part VII – Land Purchase and Change of Ownership

A **"larger common plan of development or sale"** is a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one plan. This term is used in conjunction with common promotional plan, as defined in §644, RSMo.

Any portion of a project that is sold to a developer is still considered part of a larger common plan of development or sale and will require a permit.

If a portion of a site is sold to an individual for the purpose of building his or her private residence:

- A permit is required if the portion of land sold is equal to or greater than one acre.
- A permit is not required if the portion of land sold is less than one acre.

Part VIII – Termination

The word 'plant density' was removed from the first paragraph since the department determined that percent of vegetative cover more accurately describes the vegetative requirements of this permit. This decision was made after discussion within the department and with stakeholders.

It is preferable that temporary BMPs such as sediment fence be removed prior to permit termination to eliminate potential solid waste issues that may occur as a result of unnecessary and unmaintained BMPs.

Part IX – Duty to Reapply

This section has been revised to reflect the current applicable statutes which require applicants to submit an application for coverage electronically as soon as they are made available by the director. The determination was made that facilities do not need to submit an application 30 days prior to expiration because this permit does not administratively continue. Additionally, due to limitations within the electronic system currently used to issue permits, the department will use its discretion to allow existing permit holders a period of 60 days to reapply after the new version of the permit is effective. The department will announce the availability status of the new permit and the process to reapply at least 30 days prior to the expiration of the existing permit.

Part X – Standard Conditions

This section was revised to only include the specific standard conditions that apply to this permit. All other conditions have been removed.

Part XI – Administrative Requirements

On the basis of preliminary staff review and applicable standards and regulations, the department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the permit. The proposed determinations are tentative pending public comment.

PUBLIC NOTICE:
The department shall give public notice that a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest or because of water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and facility must be notified of the denial in writing.

The department must give public notice of a pending permit or of a new or reissued Missouri State Operating Permit. The public comment period is a length of time not less than thirty (30) days following the date of the public notice, during which interested persons may submit written comments about the proposed permit.

For persons wanting to submit comments regarding this proposed permit, please refer to the Public Notice page located at the front of this draft permit. The Public Notice page gives direction on how and where to submit appropriate comments.

☒ The Public Notice period seeking comments on this permit occurred from September 2, 2016 to October 3, 2016.

DATE OF FACT SHEET: 8/23/2016; REVISED 11/30/2016

COMPLETED BY:
CHRISTOPHER MILLER
ENVIRONMENTAL SPECIALIST
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION
(573) 526-3337
christopher.miller@dnr.mo.gov

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MoDNR Geographic Information System Editor



Legend

- Land Disturbance Point
- Land Disturbance Area
- 12 Digit Watershed Boundaries
- Impaired Streams - 303(d)
- Impaired Lakes - 303(d)
- Stream Classifications and Use Designations
- Lake Classifications and Use Designations
- Public Land Survey System
- Interstates and U.S. highways
- State numbered routes
- State letttered routes
- ramps
- Major roads
- Minor roads
- Railroads
- County Boundaries
- Lake or Pond
- Lake or Pond / Intermittent
- Lake or Pond / Perennial
- Reservoir
- Swamp or Marsh
- Other; Artificial Path
- Canal or Ditch
- Stream or River
- Stream or River / Intermittent
- Stream or River / Perennial
- Municipalities Boundary
- Municipalities Fill

N

Printed: June 23, 2020

Disclaimer: Although this map has been compiled by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department as to the accuracy of the data and related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the department in the use of these data or related materials.



Missouri
Department of
Natural Resources

STORMWATER DISCHARGES FROM THIS LAND DISTURBANCE SITE ARE AUTHORIZED BY THE MISSOURI STATE OPERATING PERMIT NUMBER:

ANYONE WITH QUESTIONS OR CONCERNS ABOUT STORMWATER DISCHARGES FROM THIS SITE, PLEASE CONTACT THE MISSOURI DEPARTMENT OF NATURAL RESOURCES AT

1-800-361-4827

MISSOURI DEPARTMENT OF NATURAL RESOURCES
Division of Environmental Quality Regional Offices

Kansas City Area

Kansas City Regional Office
500 NE Colbern Rd.
Lee's Summit, MO 64086-4710
816-251-0700 FAX: 816-622-7044

St. Louis Area

St. Louis Regional Office
7545 S. Lindbergh, Ste 210
St. Louis, MO 63125
314-416-2960 FAX: 314-416-2970

Northeast Area

Northeast Regional Office
1709 Prospect Drive
Macon, MO 63552-2602
660-385-8000 FAX: 660-385-8090

Southwest Area

Southwest Regional Office
2040 W. Woodland
Springfield, MO 65807-5912
417-891-4300 FAX: 417-891-4399

Southeast Area

Southeast Regional Office
2155 North Westwood Blvd.
Poplar Bluff, MO 63901
573-840-9750 FAX: 573-840-9754

Central Area

Department Central Offices
P.O. Box 176
Jefferson City, MO 65102-0176
573-751-3443

Central Field Operations
P.O. Box 176
Jefferson City, MO 65102-0176
573-522-3322 FAX: 573-522-3522



**For more information on the departme
visit dnr.mo.gov or call 800-361-4827**

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APPENDIX B

NOTICE OF INTENT

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Resource Management
Boone County, Missouri
801 E. Walnut, Room 315
Columbia, Missouri 65201
573-886-4330

For office use only
Permit number:
Date Received:
Related permits:
Issue date:

Land Disturbance Permit Application

A land disturbance permit is required prior to land clearing activities equal to or greater than one-acre or in close proximity of an environmentally sensitive area. The applicant can request a Land Disturbance permit through the Boone County Resource Management Office. NOTE: When properly validated, this form constitutes a permit. Please attach additional sheets as required to fulfill application requirements. NO BUILDING INSPECTIONS MAY TAKE PLACE UNTIL THE LAND DISTURBANCE PERMIT HAS BEEN ISSUED.

JOB/SITE INFORMATION

OWNER: COLUMBIA PUBLIC SCHOOLS (Name) 1818 WEST WORLEY STREET, COLUMBIA, MO 65203 (Address) (573) 214-3400 (Phone)

COestreich@cpsk12.org (Email Address) N/A (Mobile Phone)

PROJECT NAME: ROSETA ACCESSIBILITY, SECURITY AND SAFETY IMPROVEMENTS

PROJECT ADDRESS: 1100 SOUTH ROSETA AVENUE, COLUMBIA, MO 65201

PARCEL NUMBER: 17-510-16-00-003.00 01

PROJECT DESCRIPTION: GENERAL SITE IMPROVEMENTS TO THE EXISTING SCHOOL FOR ACCESSIBILITY AND SAFETY RELATED ITEMS.

TOTAL SITE AREA: 10.00 ACRES TOTAL DISTURBED AREA 2.10 ACRES

DEVELOPER: COLUMBIA PUBLIC SCHOOLS (Name) 1818 WEST WORLEY STREET, COLUMBIA, MO 65203 (Address) (573) 214-3400 (Phone)

COestreich@cpsk12.org (Email Address) N/A (Mobile Phone)

CONTRACTOR: UNKNOWN AT THIS TIME (Name) (Address) (Phone)

(Email Address) (Mobile Phone)

TYPE OF CONSTRUCTION ACTIVITY

- ☐ CLEARING & GRADING ONLY
- ☐ PLANNED DEVELOPMENT
- ☐ ROAD CONSTRUCTION
- ☑ COMMERCIAL
- ☐ ENVIRONMENTALLY SENSITIVE AREA
- ☐ SINGLE FAMILY/RESIDENTIAL

OWNERS CERTIFICATION

The undersigned owner certifies that he/she is responsible for complying with the Boone County Stormwater Ordinance and for complying with the county-approved erosion and sediment control plan for this project. Boone County employees may enter the property for the purpose of inspecting and or completing erosion and sediment control measures. I understand that a final inspection by the Resource Management Inspectors must be requested, and all land disturbances found to be in compliance, in order for the performance bond to be released.

Signature of Land owner *Printed Name and Title of Landowner* *Date*

CONTRACTORS CERTIFICATION

I herby certify that the proposed site will be built according to the stamped approved Construction Plans. I further understand that any field modifications will be documented in writing, and delivered to the Boone County Inspector. Major modifications require a resubmittal of the plans with the changes indicated.

I herby certify that all erosion prevention and sediment control practices will be inspected weekly and within 24 hours of a rain event causing runoff. The permittee or contractor will maintain written records of such inspections and repairs. These records must be kept on the job site or in the office of the responsible person and be available for review at any time by an individual from the Boone County Resource Management Staff.

_____

Signature of Contractor *Printed Name and Title of Contractor* *Date*

Inspector Comments: _____

_____

_____

_____

_____

_____

_____

FOR OFFICE USE ONLY

Permit fee: $_____ *Date Paid: ____/____/____*

Copy of Bond on file with the County: (yes/no/waived) *Amount of Bond: $_____*

Copy of MDNR permit in file? (Yes/No/Not applicable) *MORA: _____*

Construction plan/Erosion & Sediment Plan approval date:

Pre-con meeting date: ____/____/____ *Construction Start date: ____/____/____*

Work days/months estimated to complete project: _____

Application approved /denied by: _____ *Date: ____/____/____*

Permit Expires: ____/____/____

Permission is hereby given to proceed with construction as shown on the approved plans and in compliance with the Ordinances of Boone County:

_____

Signature of Approving Authority Date:

APPENDIX C

AUTHORIZED REPRESENTATIVE DESIGNATION

AUTHORIZED REPRESENTATIVE DESIGNATION

Construction Site
Roseta Accessibility, Security and Safety Improvements
Columbia, Boone County, Missouri

STORM WATER POLLUTION PREVENTION PLAN
DATED June, 2020

I, **Columbia Public Schools** hereby designate the person or company specifically described below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Missouri State Operating Permit - General Permit by the Missouri Clean Water Commission, any local land disturbance permits, and this Storm Water Pollution Prevention Plan at the above indicated construction site. The designee is authorized to implement, maintain, and enforce all aspects of the Storm Water Pollution Prevention Plan (SWPPP), sign any reports/documents in the (SWPPP), and all other documents required by the land disturbance permit(s). The designee is authorized to amend the SWPPP as deemed necessary to maintain compliance with all environmental requirements.

Authorized Representative:

Company Name: _____

Company Address: _____

_____

Contact Name: _____

Phone Number: _____

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in the Missouri Clean Water Commission, Missouri State Operating Permit, General Operating Permit.

Columbia Public Schools

Operators Signature: _____

Print Name and Title: _____

Date: _____

APPENDIX D

AUTHORIZED REPRESENTATIVE CERTIFICATION

AUTHORIZED REPRESENTATIVE CERTIFICATION

Construction Site
Roseta Accessibility, Security and Safety Improvements
Columbia, Boone County, Missouri

STORM WATER POLLUTION PREVENTION PLAN
DATED June, 2020

AUTHORIZED REPRESENTATIVE CERTIFICATION:

"I certify under penalty of law that I understand the terms and conditions of the Missouri State Operating Permit - General Operating Permit by the Missouri Clean Water Commission that authorizes the discharge of storm water associated with construction or land disturbance activity from the construction site as part of this certification. Further, by my signature, I understand that I am fully responsible, along with all other contractors and subcontractors signing such certifications who are performing work activities under this contract, to comply with all provisions and requirements of the General Operating Permit and this Storm Water Pollution Prevention Plan. I understand that I, and my company, are legally required under the federal Clean Water Act and the Code of Missouri, to ensure compliance with the terms and conditions of the General Operating Permit and this Storm Water Pollution Prevention Plan (SWPPP) developed under the Missouri Clean Water Law and the National Pollution Discharge Elimination System (NPDES). I further certify that I and my company shall provide all necessary training and continuing education to all applicable personnel and subcontractors to ensure a complete understanding of all provisions and requirements of the General Operating Permit and this Storm Water Pollution Prevention Plan prior to these entities beginning any work activities on this site."

Signature: _____ Date: _____

Print Name & Title: _____

Company Name: _____

Company Address: _____

_____

Phone Number: _____

Scope of Services: _____

_____

_____

_____

_____

_____

APPENDIX E

LIST OF SUBCONTRACTORS

LIST OF SUBCONTRACTORS

Construction Site
Roseta Accessibility, Security and Safety Improvements
Columbia, Boone County, Missouri

STORM WATER POLLUTION PREVENTION PLAN
DATED June, 2020

(to be filled in by Contractor after award of contract, make copies of this form as necessary)

Subcontractor:

Company or Organization Name: _____

Address:_____

City, State, Zip Code: _____

Contact Name:_____ Phone #: _____

Contact Email: _____

Subcontractor:

Company or Organization Name: _____

Address:_____

City, State, Zip Code: _____

Contact Name:_____ Phone #: _____

Contact Email: _____

Subcontractor:

Company or Organization Name: _____

Address:_____

City, State, Zip Code: _____

Contact Name:_____ Phone #: _____

Contact Email: _____

Subcontractor:

Company or Organization Name: _____

Address:_____

City, State, Zip Code: _____

Contact Name:_____ Phone #: _____

Contact Email: _____

APPENDIX F

SUBCONTRACTORS CERTIFICATION

SUBCONTRACTORS CERTIFICATION

Construction Site
Roseta Accessibility, Security and Safety Improvements
Columbia, Boone County, Missouri

STORM WATER POLLUTION PREVENTION PLAN
DATED June, 2020

SUBCONTRACTOR'S CERTIFICATION:

"I certify under penalty of law that I understand the terms and conditions of the Missouri State Operating Permit - General Operating Permit by the Missouri Clean Water Commission that authorizes the discharge of storm water associated with construction or land disturbance activity from the construction site as part of this certification. Further, by my signature, I understand that I am fully responsible, along with all other contractors and subcontractors signing such certifications who are performing work activities under this contract, to comply with all provisions and requirements of the General Operating Permit and this Storm Water Pollution Prevention Plan. I understand that I, and my company, are legally required under the federal Clean Water Act and the Code of Missouri, to ensure compliance with the terms and conditions of the General Operating Permit and this Storm Water Pollution Prevention Plan (SWPPP) developed under the Missouri Clean Water Law and the National Pollution Discharge Elimination System (NPDES)."

Signature: _____ Date: _____

Print Name & Title: _____

Company Name: _____

Company Address: _____

_____

Phone Number: _____

Scope of Services: _____

_____

_____

_____

_____

_____

APPENDIX G

IMPLEMENTATION SCHEDULE

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IMPLEMENTATION SCHEDULE (Page 1 of 2)
Roseta Accessibility, Security and Safety Improvements
1100 S. Roseta Avenue
Columbia, Boone County, Missouri

To be filled in by the Contractor prior to initiation of construction.

Refer also to the civil plans for Sequence of Events.

Sequence of Events					
Construction Activity	**Proposed Initiation Date**	**Proposed Completion Date**	**Actual Initiation Date**	**Actual Completion Date**	**Contractor Responsible for Implementation**
1. Prior to construction, coordinate and have a pre-construction meeting regarding SWPPP training with anyone involved in land disturbance activities.					
2. Contractor shall field verify all benchmarks and survey control points prior to construction. Contact Engineering Surveys & Services representatives immediately with any noted discrepancies.					
3. Contractor shall determine all utility field locates as necessary.					
4. Install initial perimeter erosion and sediment control per plan.					
5. Install site lighting per MEP plans. Coordinate so site has operable site lighting at all times.					
6. Strip topsoil and stockpile where indicated. Immediately place sediment control around stockpile per plan.					
7. Commence site demolition per plan.					
8. Disturbed areas of the site where construction activity has ceased for more than 14 days shall be temporarily seeded, mulched, and watered, except as precluded by snow cover. In the event of snow cover, stabilization measures must be initiated as soon as practical thereafter. Disturbed areas of the site where construction activity will cease for 12 months or more shall be permanently seeded and mulched.					

IMPLEMENTATION SCHEDULE (Page 2 of 2)
Roseta Accessibility, Security and Safety Improvements
1100 S. Roseta Avenue
Columbia, Boone County, Missouri

Sequence of Events					
Construction Activity	**Proposed Initiation Date**	**Proposed Completion Date**	**Actual Initiation Date**	**Actual Completion Date**	**Contractor Responsible for Implementation**
9. Maintain all weather access to site areas as required by owner throughout the project.					
10. Commence building and storm sewer construction. Install storm sewer inlet protection immediately upon completion of each structure. Install other control devices as construction allows.					
11. Finalize pavement subgrade preparation in accordance with plans and project specifications.					
12. Install base material as required for paved areas.					
13. Commence pavement construction. remove inlet protection around inlets no more than 48 hours prior to placing stabilized base course.					
14. Complete all final grading, topsoil placement, and hydroseeding of all disturbed areas.					
15. Install site landscaping per plan.					
16. Remove all remaining temporary erosion and sediment control devices when disturbed areas are stabilized. Finish grade and reseed these areas as necessary.					
17. Other					

APPENDIX H

INSPECTION REPORT FORMS

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INSPECTION REPORT (Page 1 of 7)
Roseta Accessibility, Security and Safety Improvements
1100 S. Roseta Avenue
Columbia, Boone County, Missouri
NPDES Tracking Number: MORA16148

General Information			
Date of Inspection		**Start/End Time**	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Inspector's Qualifications	See Section 6 of SWPPP.		
Describe present phase of construction			
Type of Inspection: ❑ Regular (7 calendar day) ❑ Pre-storm event ❑ During storm event ❑ Post-storm event			
Weather Information			
Has there been a storm event since the last inspection? ❑Yes ❑No **If yes, provide:** Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):			
Weather at time of this inspection? ❑ Clear ❑Cloudy ❑ Rain ❑ Sleet ❑ Fog ❑ Snowing ❑ High Winds ❑ Other: Temperature:			
Have any discharges occurred since the last inspection? ❑Yes ❑No **If yes, describe:**			
Is there any discharges at the time of inspection? ❑Yes ❑No **If yes, describe:**			

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name and title: _____

Inspector's Signature: _____ Date: _____

INSPECTION REPORT (Page 2 of 7)
Roseta Accessibility, Security and Safety Improvements
1100 S. Roseta Avenue
Columbia, Boone County, Missouri
NPDES Tracking Number: MORA16148

Site-specific BMPs
Carry a copy of the SWPPP maps during inspections.

Site-Specific BMPs					
BMP	**BMP Installed? (yes, no, or N/A)**	**BMP Maintenance Required? (yes, no, or N/A)**	**Corrective Action Needed and Notes**	**Responsible Party for Corrective Action**	**Implementation Date of Corrective Action**
Site Staff Training on Erosion & Sediment Control					
Site Staff Training on Spill Prevention & Response Plan					
Maintaining Equipment					
Tree Preservation Barrier					
Staging Area(s)					
Vehicle/Equipment Maintenance & Fueling Area					
Toilet Facilities					
Maintaining New Vegetated Areas					
Gravel Construction Entrances, Exits, & Laydown					
Concrete Washout Area(s)					
Disposing of Trash & Debris					
Construction Waste Materials Containment					

INSPECTION REPORT (Page 3 of 7)
Roseta Accessibility, Security and Safety Improvements
1100 S. Roseta Avenue
Columbia, Boone County, Missouri
NPDES Tracking Number: MORA16148

Site-Specific BMPs					
BMP	**BMP Installed? (yes, no, or N/A)**	**BMP Maintenance Required? (yes, no, or N/A)**	**Corrective Action Needed and Notes**	**Responsible Party for Corrective Action**	**Implementation Date of Corrective Action**
Hazardous Waste Materials Containment					
Pavement/Curb & Gutter Sweeping					
Curb Inlet Filters Using Sediment Logs					
Wind Erosion & Dust Control					
Silt Fences					
Sediment Logs / Fiber Rolls					
Topsoil Stockpile and Placement					
Management of Excavation Spoil Materials					
Dewatering into BMP(s)					
Soil Roughening					
Temporary Seed & Mulch Disturbed Areas					

INSPECTION REPORT (Page 4 of 7)
Roseta Accessibility, Security and Safety Improvements
1100 S. Roseta Avenue
Columbia, Boone County, Missouri
NPDES Tracking Number: MORA16148

Site-Specific BMPs					
BMP	**BMP Installed? (yes, no, or N/A)**	**BMP Maintenance Required? (yes, no, or N/A)**	**Corrective Action Needed and Notes**	**Responsible Party for Corrective Action**	**Implementation Date of Corrective Action**
Storm Sewers					
Storm Sewer Inlet Filter					
Permanent Outlet Protection using Rip-Rap					
Temporary Inlet Protection using silt fence					
Light Compaction of All Placed Topsoil					
Landscape Installation					
Permanent Seed & Mulch					
Tackifiers & Binders (typically hydroseeding, hydromulching, etc.)					
Grass Sod Placement					
Other:					

INSPECTION REPORT (Page 5 of 7)
Roseta Accessibility, Security and Safety Improvements
1100 S. Roseta Avenue
Columbia, Boone County, Missouri
NPDES Tracking Number: MORA16148

Site-Specific BMPs					
BMP	**BMP Installed? (yes, no, or N/A)**	**BMP Maintenance Required? (yes, no, or N/A)**	**Corrective Action Needed and Notes**	**Responsible Party for Corrective Action**	**Implementation Date of Corrective Action**

INSPECTION REPORT (Page 6 of 7)
Roseta Accessibility, Security and Safety Improvements
1100 S. Roseta Avenue
Columbia, Boone County, Missouri
NPDES Tracking Number: MORA16148

General Site Issues
Below are some general site issues that should be assessed during inspections.

General Site Issues					
BMP/activity	**Implemented? (yes, no, or N/A)**	**Maintenance Required? (yes, no, or N/A)**	**Corrective Action Needed and Notes**	**Responsible Party Corrective Action**	**Implementation Date of Corrective Action**
Are all slopes and disturbed areas not actively being worked properly stabilized?					
Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMP's?					
Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?					
Are discharge points and receiving waters free of any sediment deposits?					
Are storm drain inlets properly protected?					
Is the construction exit(s) preventing sediment from being tracked onto the street(s)?					

INSPECTION REPORT (Page 7 of 7)
Roseta Accessibility, Security and Safety Improvements
1100 S. Roseta Avenue
Columbia, Boone County, Missouri
NPDES Tracking Number: MORA16148

General Site Issues					
BMP/activity	**Implemented? (yes, no, or N/A)**	**Maintenance Required? (yes, no, or N/A)**	**Corrective Action Needed and Notes**	**Responsible Party Corrective Action**	**Implementation Date of Corrective Action**
Are the surrounding streets clean and free of mud/dust/trash from the project?					
Is trash/litter from work areas collected and placed in covered dumpsters?					
Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?					
Has the on-site SWPPP been updated?					
Other:					

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Recommended Inspection Sequence – For information only

You should conduct thorough inspections of the site, making sure to inspect all areas and BMP's. The seven activities listed below are a recommended inspection sequence that will help you conduct a thorough inspection (EPA in *Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites (adapted from MPCA 2004).*

1. Plan your inspection
   - Create a checklist to use during the inspection (see Inspection Report)
   - Obtain a copy of the site map with BMP locations marked
   - Plan to walk the entire site, including discharge points from the site and any off-site support activities such as concrete batch plants should also be inspected.
   - Follow a consistent pattern each time to ensure you inspect all areas (for example, starting at the lowest point and working uphill)
2. Inspect discharge points and downstream, off-site areas
   - Inspect discharge locations to determine whether erosion and sediment control measures are effective
   - Inspect nearby downstream locations, if feasible
   - Walk *down the street* to inspect off-site areas for signs of discharge. This is important in areas with existing curbs and gutters
   - Inspect downslope municipal catch basin inlets to ensure that they are adequately protected
3. Inspect perimeter controls and slopes
   - Inspect perimeter controls such as silt fences to determine if sediment should be removed
   - Check the structural integrity of the BMP to determine if portions of the BMP need to be replaced
   - Inspect slopes and temporary stockpiles to determine if erosion controls are effective
4. Compare BMP's in the site plan with the construction site conditions
   - Determine whether BMP's are in place as required by the site plan
   - Evaluate whether BMP's have been adequately installed and maintained
   - Look for areas where BMP's are needed but are missing and are not in the SWPPP
5. Inspect construction site entrances
   - Inspect the construction exits to determine if there is tracking of sediment from the site onto the street
   - Refresh or replace the rock in designated entrances
   - Look for evidence of additional construction exits being used that are not in the SWPPP or are not stabilized
   - Sweep the street if there is evidence of sediment
6. Inspect sediment controls
   - Inspect any sediment basins for sediment accumulation
   - Remove sediment when it reduces the capacity of the basin by the specified amount (many permits have specific requirements and include those in the SWPPP)
7. Inspect pollution prevention and good housekeeping practices
   - Inspect trash areas to ensure that waste is properly contained
   - Inspect material storage and staging areas to verify potential pollutant sources are not exposed to stormwater runoff
   - Verify that concrete, paint, and stucco washouts are being used properly and are correctly sized for the volume of wash water
     - Inspect vehicle/equipment fueling and maintenance areas for signs of stormwater pollutant exposure

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APPENDIX I

SWPPP AMENDMENT REPORT FORM
&
OVERALL SWPPP AMENDMENT LOG

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SWPPP AMENDMENT REPORT FORM
Roseta Accessibility, Security and Safety Improvements
Columbia, Boone County, Missouri

(MASTER FORM – copy this page and fill in for each amendment)

AMENDMENT NUMBER: _____

INSPECTOR: _____ DATE:_____

QUALIFICATIONS OF INSPECTOR:_____

_____

_____

CHANGES REQUIRED TO THE STORMWATER POLLUTION PREVENTION PLAN: _____

_____

_____

_____

_____

_____

REASONS FOR CHANGES: _____

_____

_____

_____

_____

_____

TO BE PERFORMED BY: _____

_____

ON OR BEFORE: _____

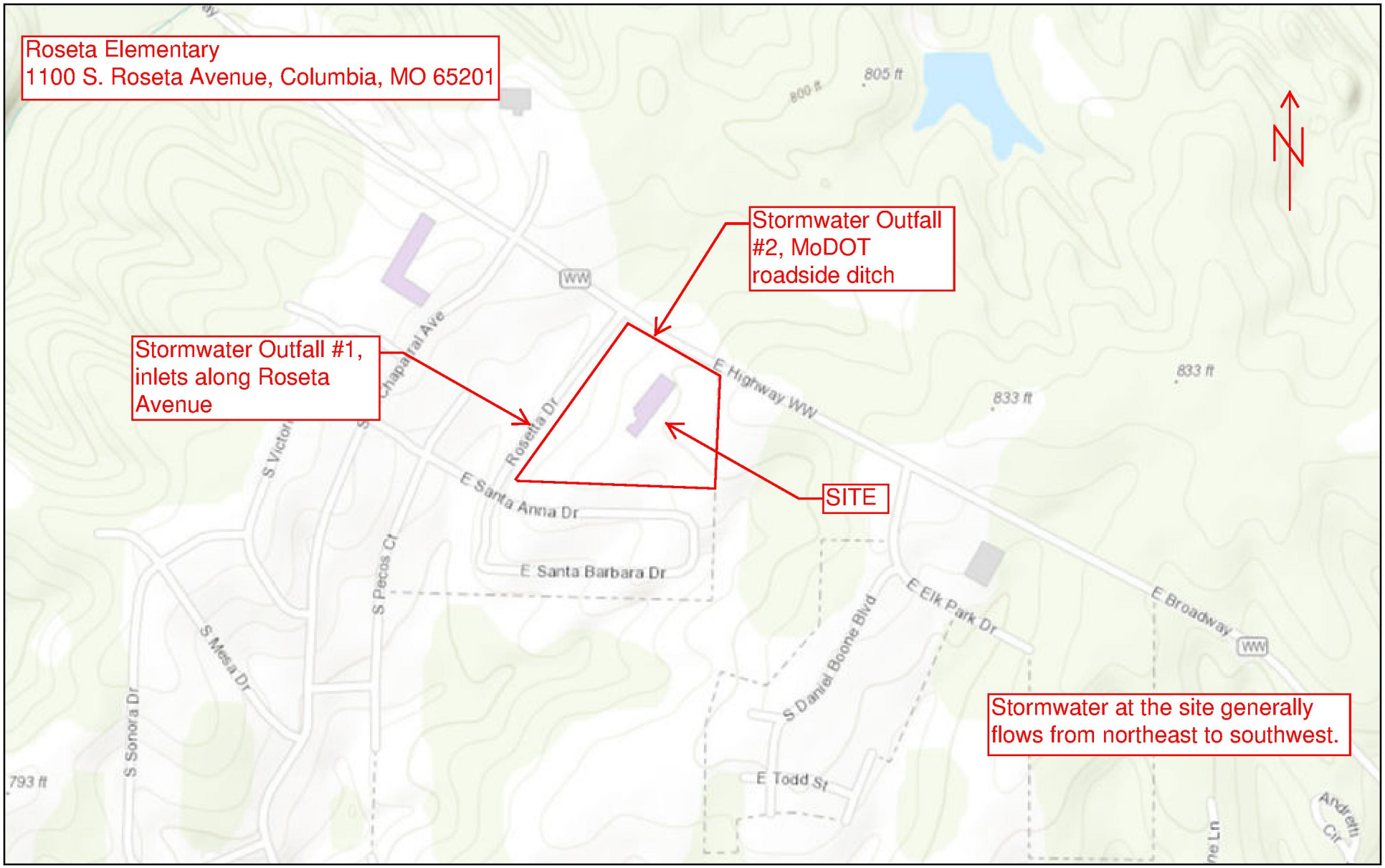
OVERALL SWPPP AMENDMENT LOG
Roseta Accessibility, Security and Safety Improvements
Columbia, Boone County, Missouri

Amendment #	Date	Description of Amendment	Amendment Prepared by (Name and title)

APPENDIX J

GENERAL LOCATION MAP

General Location Map - Roseta Elementary



1:9,028

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS,

USGS

USGS The National Map: Orthoimagery | Garrity, C.P., Soller, D.R. | USGS National Map 3D Elevation Program (3DEP) | USGS TNM - 3D Elevation Program (3DEP). Data Refreshed Weekly. | USGS The National Map: 3D Elevation Program. Data Refreshed April,

APPENDIX K

CONSTRUCTION SITE NOTICES

EMERGENCY, SITE, & SWPPP CONTACT INFORMATION
TO BE FILLED OUT BY CONTRACTOR AND POSTED ON-SITE

Emergency: Fire, Police, & Ambulance		Phone:	911
Operator:	**Address:**		
Columbia Public Schools	1818 West Worley Street, Columbia, MO 65203	Phone:	573-214-3400
24 Hour Contact:	Charles Oestriech	Mobile:	573-214-3760
General Contractor:	**Address:**		
		Phone:	
24 Hour Contact:		Mobile:	
24 Hour Contact:		Mobile:	
Subcontractors:	**Company Address / Contact Name:**		
Sub #1:		Phone:	
Sub #2:		Phone:	
Sub #3:		Phone:	
City/County Contact:	Boone County Public Works Department	Phone:	573-449-8515
MDNR:	Water Pollution Control Program	Phone:	1-573-751-1300
National Response Center:		Phone:	1-800-424-8802
SWPPP Location:	1100 S. Roseta Avenue, Columbia, MO 65201		
SWPPP Contact:	Phone:		

APPENDIX L

RECORD OF PERSONNEL TRAINING ACTIVITIES FORM

RECORD OF PERSONNELTRAINING ACTIVITIES FORM
Roseta Accessibility, Security and Safety Improvements
Columbia, Boone County, Missouri

Instructor: _____ Date: _____

Instructor Title: _____ Phone #: _____

Course Location: _____

Course Length: _____

SWPPP Training Topic: (check as appropriate)

- ☐ Structural BMPs
- ☐ Non-Structural BMPs
- ☐ Non-Storm Water Management
- ☐ Construction Plans
- ☐ Other: _____
- ☐ SWPPP Basics
- ☐ Good Housekeeping BMPs
- ☐ Waste Management and Materials Pollution Control
- ☐ Emergency Procedures

Specific Training Objective: _____

_____

_____

Attendance Roster: (attach additional pages as necessary)

Name	Company	Telephone Number	Signature

APPENDIX M

REPORTABLE QUANTITY RELEASE FORM

REPORTABLE QUANTITY RELEASE FORM

Roseta Accessibility, Security and Safety Improvements
1100 S. Roseta Avenue
Columbia, Boone County, Missouri

The discharges of hazardous substances or oil in storm water discharges from construction sites shall be prevented or minimized in accordance with the SWPPP. When a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under 40CFR110, 40CFR117, and 40CFR302 occurs, the following steps shall be taken:

1. All measures shall be taken to contain and abate the spill and to prevent the discharge of the pollutant(s) to storm water or off-site.

2. Notice must be provided to the National Response Center (NRC) at 1-800-424-8802, and MDNR at 1-573-751-1300, in accordance with regulations referenced above as soon as site staff has knowledge of the discharge.

3. Contact the Operator, Engineer, local Fire Department, Joint Communications, local Sheriff's Department, Boone County Public Works, MDNR, and EPA immediately upon knowledge of release.

4. The SWPPP shall be modified within seven (7) calendar days of knowledge of the discharge to provide a description of the release, the circumstances leading to the release, and the date of the release. The plans shall identify measures to prevent the recurrence of such releases and to respond to such releases.

Date of Spill	Material Spilled	Approximate Quantity of Spill (in gallons)	Agency(s) Notified	Date of Notification	SWPPP Revision Date

APPENDIX N

RECORD OF RAINFALL

RECORD OF RAINFALL

Roseta Accessibility, Security and Safety Improvements

Year 20___ Columbia, Boone County, Missouri All rainfall amounts are in inches.

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1												
2												
3												
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Initials												

APPENDIX O

NOTICE OF TERMINATION(S)
&
FINAL STABILIZATION/TERMINATION CHECKLIST

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MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH

REQUEST FOR TERMINATION OF OPERATING PERMIT

(REPLACES TERMINATION FORMS H AND J)

FOR OFFICE USE ONLY
DATE RECEIVED

IF A FACILITY OR SITE HAS BEEN SOLD, BUT PERMITTED ACTIVITIES HAVE NOT CEASED, A TRANSFER OF OWNERSHIP FORM (MO 780-1517) MUST BE COMPLETED RATHER THAN A TERMINATION FORM.

ALL APPLICABLE SECTIONS OF THIS FORM MUST BE COMPLETED.

1. FACILITY INFORMATION

PERMIT NUMBER	COUNTY		
NAME OF FACILITY			
PHYSICAL ADDRESS	CITY	STATE	ZIP CODE

FACILITY CONTACT NAME	FACILITY CONTACT TELEPHONE NUMBER	FACILITY CONTACT EMAIL

2. OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE		
ADDRESS	CITY	STATE	ZIP CODE
EMAIL			

3. CONTINUING AUTHORITY

NAME	TELEPHONE NUMBER WITH AREA CODE		
ADDRESS	CITY	STATE	ZIP CODE
EMAIL			

4. REASON FOR TERMINATION REQUEST (CHECK ONE)

☐ Permitted activities have ceased, or facility is closed (must select facility type in section five and attach photographs or any other supporting documents as required).

☐ General Permit MO-G _____or MO-R _____ has been issued and covers all regulated activities.

☐ Site specific permit MO- _____ has been issued and covers all regulated activities.

☐ Facility has obtained a "No Exposure" certification, MO-NX_____.

☐ Industrial activity (SIC Code # _____) is not regulated.

☐ For CAFOs, facility size is unregulated (Class II and smaller operations only).

☐ Other (Specify).

5. FACILITY TYPE (CHECK ONE FACILITY TYPE, COMPLETE ONLY IF PERMITTED ACTIVITY HAS CEASED OR FACILITY HAS CLOSED)

☐ For land disturbance sites, the area is stabilized; perennial vegetation, pavement, buildings or other permanent structures cover all areas that have been disturbed; no further land disturbance activities are planned; all building construction (commercial or residential) is completed; temporary best management practices are removed, and construction equipment is removed. With respect to areas that have been vegetated, vegetation cover shall be at least 70 percent over 100 percent of the site not covered in impervious material. Attach photographs showing stabilized areas.

☐ For wastewater treatment plants, the treatment plant is removed and sludge was removed and properly disposed of, and a closure plan in accordance with 10 CSR 20-6.010(12) or 10 CSR 20-6.015(5) was approved and implemented. Attach documentation required by the approved closure plan and photographs of the closed area. See the *Water Treatment Plant Closure* -PUB2568 fact sheet at dnr.mo.gov/pubs/pub2568.htm for more information on closure requirements for wastewater treatment plants.

☐ For industrial facilities, regulated activities have ceased, no "significant materials" remain on-site and disturbed areas are properly stabilized or vegetated. The area is stabilized when perennial vegetation, pavement, buildings or structures using permanent materials cover all areas that have been disturbed. Vegetation cover shall be at least 70 percent over 100 percent of the site not covered in impervious material. Attach applicable closure documents and photographs of the closed area that demonstrate no permitted activities or materials remain.

☐ For quarries or sand and gravel operations, submit documentation of release from the department's Land Reclamation Program.

☐ For landfills, official closure has been received from department's Solid Waste Management Program (SWMP); cap is vegetated as required by SWMP; and any additional industrial activities are permitted appropriately (i.e., transfer stations, mulching operations, land disturbance, etc.). Attach the official SWMP closure letter and permit numbers of any continuing active industrial or land disturbance activities.

☐ For CAFOs

- ☐ Class I CAFOs must properly close lagoons and waste storage structures per a closure plan in accordance with 10 CSR 20-6.300(6) and approved by the department. Attach photographs of closed lagoons. Also attach any additional information that supports closure of the facility.
- ☐ Class II CAFOs must close waste storage structures in accordance with 10 CSR 20-6.300(6)(B), or shall continue to maintain all storage structures so there is no discharge to waters of the state. Attach photographs of closed or re-purposed lagoons, or an explanation of "no discharge" methods. Also attach any additional information that supports closure of the facility.

6. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	TELEPHONE NUMBER WITH AREA CODE
SIGNATURE	DATE SIGNED

7. MAIL COMPLETED COPY TO:

For Site Specific (MO-), Abandoned Mine And Land Reclamation (MO-G05), Land Disturbance By County Or City (MO-R100), Pesticide Application (MO-G87), Sewer Extension Construction (MO-GC) and CAFO (MO-G01, MO-GS1) Permit Terminations:

Missouri Department of Natural Resources
Water Protection Program
Water Pollution Control Branch
Attn: Operating Permits Section
P.O. Box 176
Jefferson City, MO 65102-0176

For General Permit Terminations (MO-G or MO-R):

Send to the appropriate regional office.
Regional office is determined based on the county where the facility is physically located.

To determine the correct regional office for the permitted facility, see **dnr.mo.gov/regions.**

FINAL STABILIZATION/TERMINATION CHECKLIST

Roseta Accessibility, Security and Safety Improvements
Columbia, Boone County, Missouri

- ☐ All soil disturbing activities are complete.
- ☐ All construction debris and trash has been removed.
- ☐ All paved surfaces onsite and in the surrounding area have been cleaned of all onsite sediment, trash, debris, etc.
- ☐ All Subcontractors have completed and cleaned up their work involving land disturbance/erosion and sediment control. The general contractor has inspected and approved this work.
- ☐ All temporary BMP's (such as silt fence) have been removed, finish graded, and seed and mulched. Residual sediment has been removed as needed. BMP's that will completely decompose, including some fiber rolls and blankets, may be left in place as approved by Operator.
- ☐ All areas where erosion-control blankets/mats were installed have been inspected. All loose, exposed blanket has been restapled/staked. If less than 70% blanket area is covered by vegetation, coordinate with Operator to determine solution.
- ☐ The project is stabilized. (The project is considered stabilized when perennial vegetation, pavement, buildings, or structures using permanent materials cover all areas that have been disturbed. Perennial vegetative cover shall be at least 70% of fully established plant density over 100% of the disturbed area.)
- ☐ All signs of erosion and sediment deposition have been repaired and are permanently stabilized.
- ☐ All permanent BMP's are in place and operational. Written maintenance requirements for all permanent BMP's have been provided to the Operator.
- ☐ All drainage conveyances and inlets/outlets have been installed per plan; all trash/debris has been removed, and are functioning as intended. All Inlet/outlet areas have been inspected to ensure complete stabilization in the surrounding area.
- ☐ All rip-rap areas are stable and rip-rap that has become dislodged has been replaced.

CONTRACTOR'S CERTIFICATION:

"I certify under penalty of law that all storm water discharges associated with Construction Activity from the identified project that are authorized by the NPDES General Operating Permit, have been eliminated, and that all disturbed areas and soils at the construction site have achieved final stabilization and all temporary erosion and sediment control measures have been removed or will be removed at a scheduled time coordinated with and approved by the Operator."

Name (Print) & Title: _____ _____

Signature: _____ Date: _____

Company Name: _____

Final Stabilization Date: _____

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APPENDIX P

TMDL DOCUMENTATION
(303d IMPAIRED WATERWAY)

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Missouri Department of Natural Resources

2018 Section 303(d) Listed Waters

Clean Water Commission Approved 10-18-2018

Row #	Year	WBID	Waterbody	Class	Imp. Size	Entire WB Impaired	WB Size	Units	IU	Pollutant	Source	County Up/Down	WBD 8	Comment
1	2012	2188.00	Antire Cr.	P	1.90	Yes	1.90	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140102	1
2	**2018**	**2668.00**	**Ashley Cr.**	**P**	**2.50**	Yes	**2.50**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Source Unknown**	**Dent**	**11010008**	**1**
3	2010	7627.00	August A Busch Lake No. 37	UL	30.00	Yes	30.00	Acres	GEN	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	St. Charles	07110009	1, 7
4	**2018**	**7637.00**	**August A Busch Lake Number 36**	**UL**	**16.00**	Yes	**16.00**	**Acres**	**GEN**	**Mercury in Fish Tissue (T)**	**Atmospheric Deposition - Toxics**	**St. Charles**	**07110009**	**1, 7**
5	2016	4083.00	Barker Creek tributary	C	1.20	Yes	1.20	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Henry	10290108	1
6	**2018**	**2693.00**	**Barn Hollow**	**C**	**8.20**	Yes	**8.20**	**Miles**	**AQL**	**Oxygen, Dissolved (W)**	**Source Unknown**	**Howell/Texas**	**11010008**	**1**
7	2012	0752.00	Bass Cr.	C	4.40	Yes	4.40	Miles	WBC A	Escherichia coli (W)	Rural NPS	Boone	10300102	1
8	2012	3240.00	Baynham Br.	P	4.00	Yes	4.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	Newton	11070207	1
9	2014	3224.00	Beef Br.	P	2.50	Yes	2.50	Miles	AQL	Cadmium (S)	Mill Tailings	Newton	11070207	1
10	2014	3224.00	Beef Br.	P	2.50	Yes	2.50	Miles	AQL	Cadmium (W)	Mill Tailings	Newton	11070207	1
11	2014	3224.00	Beef Br.	P	2.50	Yes	2.50	Miles	AQL	Lead (S)	Mill Tailings	Newton	11070207	1
12	2014	3224.00	Beef Br.	P	2.50	Yes	2.50	Miles	AQL	Zinc (S)	Mill Tailings	Newton	11070207	1
13	2014	3224.00	Beef Br.	P	2.50	Yes	2.50	Miles	AQL	Zinc (W)	Mill Tailings	Newton	11070207	1
14	2006	2760.00	Bee Fk.	C	8.70	No	8.70	Miles	AQL	Lead (W)	Fletcher Lead Mine/Mill	Reynolds	11010007	1
15	2014	7309.00	Bee Tree Lake	L3	10.00	Yes	10.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	St. Louis	07140102	1
16	2006	7365.00	Belcher Branch Lake	L3	42.00	Yes	42.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Buchanan	10240012	1
17	**2018**	**7186.00**	**Ben Branch Lake**	**L3**	**37.00**	No	**37.00**	**Acres**	**HHP**	**Mercury in Fish Tissue (T)**	**Atmospheric Deposition - Toxics**	**Osage**	**10300102**	**1**
18	2014	3980.00	Bens Branch	C	5.80	Yes	5.80	Miles	AQL	Cadmium (S)	Oronogo/Duenweg Mining Belt	Jasper	11070207	1
19	**2018**	**3980.00**	**Bens Branch**	**C**	**5.80**	Yes	**5.80**	**Miles**	**AQL**	**Cadmium (W)**	**Mill Tailings**	**Jasper**	**11070207**	**1**
20	2014	3980.00	Bens Branch	C	5.80	Yes	5.80	Miles	AQL	Lead (S)	Oronogo/Duenweg Mining Belt	Jasper	11070207	1
21	2014	3980.00	Bens Branch	C	5.80	Yes	5.80	Miles	AQL	Zinc (S)	Oronogo/Duenweg Mining Belt	Jasper	11070207	1
22	2016	3980.00	Bens Branch	C	5.80	Yes	5.80	Miles	AQL	Zinc (W)	Oronogo/Duenweg Mining Belt	Jasper	11070207	1
23	2010	2916.00	Big Cr.	P	34.10	No	34.10	Miles	AQL	Cadmium (S)	Glover smelter	Iron	08020202	1
24	2010	1578.00	Big Piney R.	P	7.80	No	7.80	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Texas	10290202	1, 5

Row #	Year	WBID	Waterbody	Class	Imp. Size	Entire WB Impaired	WB Size	Units	IU	Pollutant	Source	County Up/Down	WBD 8	Comment
25	2006	2080.00	Big R.	P	81.30	No	81.30	Miles	AQL	Cadmium (S)	Old Lead Belt tailings	St. Francois/Jefferson	07140104	1
26	2012	2080.00	Big R.	P	81.30	Yes	81.30	Miles	AQL	Zinc (S)	Old Lead Belt tailings	St. Francois/Jefferson	07140104	1
27	2006	3184.00	Blackberry Cr.	C	6.50	No	6.50	Miles	AQL	Chloride (W)	Asbury Power Plant	Jasper	11070207	1
28	2016	3184.00	Blackberry Cr.	C	6.50	Yes	6.50	Miles	AQL	Oxygen, Dissolved (W)	Ind. Point Source Discharge and NPS	Jasper	11070207	1
29	2008	3184.00	Blackberry Cr.	C	6.50	No	6.50	Miles	AQL	Sulfate + Chloride (W)	Asbury Power Plant	Jasper	11070207	1
30	2012	0111.00	Black Cr.	P	19.40	Yes	19.40	Miles	WBC B	Escherichia coli (W)	Shelbyville WWTF, Nonpoint Source	Shelby	07110005	1
31	2006	3825.00	Black Cr.	P	1.60	Yes	1.60	Miles	AQL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis	07140101	1
32	2012	3825.00	Black Cr.	P	1.60	Yes	1.60	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101	1
33	2012	3825.00	Black Cr.	P	1.60	Yes	1.60	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101	1
34	2002	2769.00	Black R.	P	47.10	Yes	47.10	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Butler	11010007	1, 5
35	2002	2784.00	Black R.	P	39.00	Yes	39.00	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Wayne/Butler	11010007	1, 5
36	2006	0417.00	Blue R.	P	4.40	Yes	4.40	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101	1
37	2016	0417.00	Blue R.	P	4.40	Yes	4.40	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101	1
38	2006	0418.00	Blue R.	P	9.40	Yes	9.40	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101	1
39	2016	0418.00	Blue R.	P	9.40	Yes	9.40	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101	1
40	2006	0419.00	Blue R.	P	7.70	Yes	7.70	Miles	WBC A	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101	1
41	2012	1701.00	Bonhomme Cr.	C	2.50	Yes	2.50	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	10300200	1
42	2006	0750.00	Bonne Femme Cr.	P	7.80	Yes	7.80	Miles	WBC A	Escherichia coli (W)	Rural NPS	Boone	10300102	1
43	2012	0753.00	Bonne Femme Cr.	C	7.00	Yes	7.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	Boone	10300102	1
44	2002	2034.00	Bourbeuse R.	P	136.70	Yes	136.70	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Phelps/Franklin	07140103	1, 5
45	2014	7003.00	Bowling Green Lake - Old	L1	7.00	Yes	7.00	Acres	AQL	Chlorophyll-a (W)	Rural NPS	Pike	07110004	1, 4, 5
46	2012	7003.00	Bowling Green Lake - Old	L1	7.00	Yes	7.00	Acres	AQL	Nitrogen, Total (W)	Rural NPS	Pike	07110004	1, 4, 5
47	2012	7003.00	Bowling Green Lake - Old	L1	7.00	Yes	7.00	Acres	AQL	Phosphorus, Total (W)	Rural NPS	Pike	07110004	1, 4, 5
48	2012	1796.00	Brazeau Cr.	P	10.80	Yes	10.80	Miles	WBC B	Escherichia coli (W)	Rural NPS	Perry	07140105	1
49	2002	1371.00	Brush Cr.	P	4.70	Yes	4.70	Miles	AQL	Oxygen, Dissolved (W)	Humansville WWTP	Polk/St. Clair	10290106	1
50	2016	3986.00	Brush Creek	C	5.40	Yes	5.40	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101	1
51	2016	3986.00	Brush Creek	C	5.40	Yes	5.40	Miles	AQL	Oxygen, Dissolved (W)	Nonpoint Source	Jackson	10300101	1

Row #	Year	WBID	Waterbody	Class	Imp. Size	Entire WB Impaired	WB Size	Units	IU	Pollutant	Source	County Up/Down	WBD 8	Comment
52	2014	3986.00	Brush Creek	C	5.40	Yes	5.40	Miles	AQL	Polycyclic Aromatic Hydrocarbons-PAHs (S)	Nonpoint Source	Jackson	10300101	1
53	2016	7117.00	Buffalo Bill Lake	L3	45.00	Yes	45.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	DeKalb	10280101	1
54	2012	3273.00	Buffalo Cr.	P	8.00	Yes	8.00	Miles	AQL	Fishes Bioassessments/ Unknown (W)	Source Unknown	Newton/McDonald	11070208	1, 8
55	2006	1865.00	Burgher Br.	C	1.50	Yes	1.50	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Phelps	07140102	1
56	**2018**	**3414.00**	**Burr Oak Cr.**	**C**	**6.80**	Yes	**6.80**	**Miles**	**SCR**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**Jackson**	**10300101**	**1**
57	**2018**	**3414.00**	**Burr Oak Cr.**	**C**	**6.80**	Yes	**6.80**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**Jackson**	**10300101**	**1**
58	2006	7057.00	Busch W.A. No. 35 Lake	L3	51.00	Yes	51.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	St. Charles	07110009	1
59	2006	3234.00	Capps Cr.	P	5.00	Yes	5.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Barry/Newton	11070207	1
60	2016	3241.00	Carver Br.	P	3.00	Yes	3.00	Miles	WBC A	Escherichia coli (W)	Nonpoint Source	Newton	11070207	1
61	2010	2288.00	Castor R.	P	7.50	Yes	7.50	Miles	WBC A	Escherichia coli (W)	Rural NPS	Bollinger	07140107	2
62	2008	0737.00	Cedar Cr.	C	37.40	No	37.40	Miles	AQL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	Boone	10300102	1, 8
63	2008	1344.00	Cedar Cr.	P	31.00	No	31.00	Miles	AQL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	Cedar	10290106	1, 8
64	2016	1344.00	Cedar Cr.	P	31.00	Yes	31.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Cedar	10290106	1
65	2010	1344.00	Cedar Cr.	P	31.00	No	31.00	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Cedar	10290106	1
66	2010	1357.00	Cedar Cr.	C	16.20	Yes	16.20	Miles	AQL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	Dade/Cedar	10290106	1, 8
67	2008	1357.00	Cedar Cr.	C	16.20	Yes	16.20	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Dade/Cedar	10290106	1
68	2006	3203.00	Center Cr.	P	26.80	No	26.80	Miles	AQL	Cadmium (S)	Tri-State Mining District	Jasper	11070207	1
69	2006	3203.00	Center Cr.	P	26.80	No	26.80	Miles	AQL	Cadmium (W)	Tri-State Mining District	Jasper	11070207	1
70	2014	3203.00	Center Cr.	P	26.80	Yes	26.80	Miles	WBC A	Escherichia coli (W)	Nonpoint Source	Jasper	11070207	1
71	2006	3203.00	Center Cr.	P	26.80	No	26.80	Miles	AQL	Lead (S)	Tri-State Mining District	Jasper	11070207	1
72	2008	3210.00	Center Cr.	P	21.00	Yes	21.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Newton/Jasper	11070207	1
73	2010	3214.00	Center Cr.	P	4.90	Yes	4.90	Miles	WBC A	Escherichia coli (W)	Rural NPS	Lawrence/Newton	11070207	1
74	2016	5003.00	Center Creek tributary	C	2.70	Yes	2.70	Miles	AQL	Cadmium (W)	Oronogo/Duenweg Mining Belt	Jasper	11070207	1
75	2016	5003.00	Center Creek tributary	C	2.70	Yes	2.70	Miles	AQL	Zinc (W)	Oronogo/Duenweg Mining Belt	Jasper	11070207	1
76	2006	3168.00	Chat Cr.	C	2.10	Yes	2.10	Miles	AQL	Cadmium (W)	Baldwin Park Mine	Lawrence	11070207	1
77	2012	3963.00	Chat Creek tributary	US	0.90	Yes	0.90	Miles	GEN	Cadmium (W)	Baldwin Park Mine	Lawrence	11070207	1, 7
78	2012	3963.00	Chat Creek tributary	US	0.90	Yes	0.90	Miles	GEN	Zinc (W)	Baldwin Park Mine	Lawrence	11070207	1, 7

Row #	Year	WBID	Waterbody	Class	Imp. Size	Entire WB Impaired	WB Size	Units	IU	Pollutant	Source	County Up/Down	WBD 8	Comment
79	2014	7634.00	Chaumiere Lake	UL	3.40	Yes	3.40	Acres	GEN	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Clay	10300101	1, 7
80	2012	1781.00	Cinque Hommes Cr.	P	17.10	Yes	17.10	Miles	WBC B	Escherichia coli (W)	Rural NPS	Perry	07140105	1
81	2016	1781.00	Cinque Hommes Cr.	P	17.10	Yes	17.10	Miles	SCR	Escherichia coli (W)	Rural NPS	Perry	07140105	1
82	**2018**	**1000.00**	**Clark Fk.**	**C**	**6.00**	Yes	**6.00**	**Miles**	**AQL**	**Oxygen, Dissolved (W)**	**Source Unknown**	**Cole**	**10300102**	**1**
83	2006	1333.00	Clear Cr.	P	28.20	Yes	28.20	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Vernon/St. Clair	10290105	1
84	2006	1336.00	Clear Cr.	C	22.30	Yes	22.30	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Vernon	10290105	1
85	2006	3238.00	Clear Cr.	P	11.10	Yes	11.10	Miles	WBC B	Escherichia coli (W)	Rural NPS	Lawrence/Newton	11070207	1
86	2002	3239.00	Clear Cr.	C	3.50	Yes	3.50	Miles	AQL	Nutrient/Eutrophication Biol. Indicators (W)	Monett WWTP	Barry/Lawrence	11070207	1, 4
87	2002	3239.00	Clear Cr.	C	3.50	Yes	3.50	Miles	AQL	Oxygen, Dissolved (W)	Monett WWTP	Barry/Lawrence	11070207	1
88	2006	0935.00	Clear Fk.	P	25.80	No	25.80	Miles	AQL	Oxygen, Dissolved (W)	Knob Noster WWTP	Johnson	10300104	1
89	2014	7326.00	Clearwater Lake	L2	1635.00	Yes	1635.00	Acres	AQL	Chlorophyll-a (W)	Rural NPS	Wayne/Reynolds	11010007	1, 4
90	2002	7326.00	Clearwater Lake	L2	1635.00	Yes	1635.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Wayne/Reynolds	11010007	1
91	2016	7326.00	Clearwater Lake	L2	1635.00	Yes	1635.00	Acres	AQL	Phosphorus, Total (W)	Nonpoint Source	Wayne/Reynolds	11010007	1, 4
92	2006	1706.00	Coldwater Cr.	C	6.90	Yes	6.90	Miles	AQL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis	10300200	1
93	2012	2177.00	Coonville Cr.	C	1.30	Yes	1.30	Miles	AQL	Lead (W)	Source Unknown	St. Francois	07140104	1
94	2016	7378.00	Coot Lake	L3	20.00	Yes	20.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Jackson	10290108	1
95	2016	7379.00	Cottontail Lake	L3	22.00	Yes	22.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Jackson	10290108	1
96	2006	1943.00	Courtois Cr.	P	32.00	No	32.00	Miles	AQL	Lead (S)	Doe Run Viburnum Division Lead mine	Washington	07140102	1
97	2012	2382.00	Crane Cr.	P	13.20	Yes	13.20	Miles	AQL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	Stone	11010002	1, 8
98	2016	7334.00	Crane Lake	L3	109.00	Yes	109.00	Acres	AQL	Chlorophyll-a (W)	Source Unknown	Iron	08020202	1, 4
99	2016	7334.00	Crane Lake	L3	109.00	Yes	109.00	Acres	AQL	Phosphorus, Total (W)	Source Unknown	Iron	08020202	1, 4
100	2012	2816.00	Craven Ditch	C	11.60	Yes	11.60	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Butler	11010007	1
101	2006	1703.00	Creve Coeur Cr.	C	3.80	Yes	3.80	Miles	AQL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis	10300200	1
102	2006	1928.00	Crooked Cr.	P	3.50	Yes	3.50	Miles	AQL	Cadmium (S)	Buick Lead Smelter	Crawford	07140102	1
103	2006	1928.00	Crooked Cr.	P	3.50	Yes	3.50	Miles	AQL	Cadmium (W)	Buick Lead Smelter	Crawford	07140102	1
104	2006	1928.00	Crooked Cr.	P	3.50	Yes	3.50	Miles	AQL	Lead (S)	Buick Lead Smelter	Crawford	07140102	1
105	2008	3961.00	Crooked Creek	C	6.50	Yes	6.50	Miles	AQL	Cadmium (W)	Buick Lead Smelter	Iron/Crawford	07140102	1

Row #	Year	WBID	Waterbody	Class	Imp. Size	Entire WB Impaired	WB Size	Units	IU	Pollutant	Source	County Up/Down	WBD 8	Comment
106	2010	3961.00	Crooked Creek	C	6.50	Yes	6.50	Miles	AQL	Copper (W)	Buick Lead Smelter	Iron/Crawford	07140102	1
107	2016	7135.00	Crowder St. Park Lake	L3	18.00	Yes	18.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Grundy	10280102	1
108	2006	2636.00	Current R.	P	124.00	Yes	124.00	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Shannon/Ripley	11010008	1
109	**2018**	**2662.00**	**Current R.**	**P**	**18.80**	Yes	**18.80**	**Miles**	**HHP**	**Mercury in Fish Tissue (T)**	**Atmospheric Deposition - Toxics**	**Dent/Shannon**	**11010008**	**1**
110	2006	0219.00	Dardenne Cr.	P1	7.00	Yes	7.00	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	St. Charles	07110009	1
111	**2018**	**0221.00**	**Dardenne Cr.**	**P**	**16.50**	Yes	**16.50**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**St. Charles**	**07110009**	**1**
112	2006	3826.00	Deer Cr.	P	1.60	Yes	1.60	Miles	AQL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis/St. Louis City	07140101	1
113	2012	3826.00	Deer Cr.	P	1.60	Yes	1.60	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis/St. Louis City	07140101	1
114	2012	3826.00	Deer Cr.	P	1.60	Yes	1.60	Miles	WBC A	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis/St. Louis City	07140101	1
115	2002	7015.00	Deer Ridge Community Lake	L3	39.00	Yes	39.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Lewis	07110002	1
116	2006	3109.00	Ditch #36	P	7.80	Yes	7.80	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Dunklin	08020204	1
117	2006	3810.00	Douger Br.	C	2.80	Yes	2.80	Miles	AQL	Lead (S)	Aurora Lead Mining District	Lawrence	11070207	1
118	2006	3810.00	Douger Br.	C	2.80	Yes	2.80	Miles	AQL	Zinc (S)	Aurora Lead Mining District	Lawrence	11070207	1
119	2006	1180.00	Dousinbury Cr.	P	3.90	Yes	3.90	Miles	WBC B	Escherichia coli (W)	Rural NPS	Dallas	10290110	1
120	2016	1792.00	Dry Fk.	C	3.20	Yes	3.20	Miles	WBC B	Escherichia coli (W)	Source Unknown	Perry	07140105	1
121	2008	3189.00	Dry Fk.	C	10.20	Yes	10.20	Miles	WBC A	Escherichia coli (W)	Rural NPS	Jasper	11070207	1
122	2016	3163.00	Dry Hollow	C	0.50	Yes	0.50	Miles	SCR	Escherichia coli (W)	Source Unknown	Lawrence	11070207	1
123	2006	3569.00	Dutro Carter Cr.	P	1.50	No	1.50	Miles	AQL	Oxygen, Dissolved (W)	Rolla SE WWTP	Phelps	07140102	1
124	2016	3570.00	Dutro Carter Cr.	C	0.50	Yes	0.50	Miles	SCR	Escherichia coli (W)	Source Unknown	Phelps	07140102	1
125	2016	3570.00	Dutro Carter Cr.	C	0.50	Yes	0.50	Miles	WBC B	Escherichia coli (W)	Source Unknown	Phelps	07140102	1
126	2016	3199.00	Duval Cr.	C	7.00	Yes	7.00	Miles	WBC B	Escherichia coli (W)	Nonpoint Source	Jasper	11070207	1
127	2006	2166.00	Eaton Br.	C	1.20	Yes	1.20	Miles	AQL	Cadmium (S)	Leadwood tailings pond	St. Francois	07140104	1
128	2006	2166.00	Eaton Br.	C	1.20	Yes	1.20	Miles	AQL	Cadmium (W)	Leadwood tailings pond	St. Francois	07140104	1
129	2006	2166.00	Eaton Br.	C	1.20	Yes	1.20	Miles	AQL	Lead (S)	Leadwood tailings pond	St. Francois	07140104	1
130	**2018**	**2166.00**	**Eaton Br.**	**C**	**1.20**	Yes	**1.20**	**Miles**	**AQL**	**Lead (W)**	**Leadwood tailings pond**	**St. Francois**	**07140104**	**1**
131	2006	2166.00	Eaton Br.	C	1.20	Yes	1.20	Miles	AQL	Zinc (S)	Leadwood tailings pond	St. Francois	07140104	1
132	2006	2166.00	Eaton Br.	C	1.20	Yes	1.20	Miles	AQL	Zinc (W)	Leadwood tailings pond	St. Francois	07140104	1

Row #	Year	WBID	Waterbody	Class	Imp. Size	Entire WB Impaired	WB Size	Units	IU	Pollutant	Source	County Up/Down	WBD 8	Comment
133	2010	0372.00	E. Fk. Crooked R.	P	19.90	Yes	19.90	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Ray	10300101	1
134	2006	0457.00	E. Fk. Grand R.	P	28.70	Yes	28.70	Miles	WBC A	Escherichia coli (W)	Rural NPS	Worth/Gentry	10280101	1, 5
135	**2018**	**0428.00**	**E. Fk. L. Blue R.**	**C**	**3.70**	Yes	**3.70**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**Jackson**	**10300101**	**1**
136	2008	0608.00	E. Fk. Locust Cr.	P	16.70	Yes	16.70	Miles	WBC B	Escherichia coli (W)	Nonpoint Source	Sullivan	10280103	1
137	**2018**	**0608.00**	**E. Fk. Locust Cr.**	**P**	**16.70**	Yes	**16.70**	**Miles**	**SCR**	**Escherichia coli (W)**	**Nonpoint Source**	**Sullivan**	**10280103**	**1**
138	2008	0610.00	E. Fk. Locust Cr.	C	15.70	Yes	15.70	Miles	WBC A	Escherichia coli (W)	Rural NPS	Sullivan	10280103	1
139	2008	0610.00	E. Fk. Locust Cr.	C	15.70	No	15.70	Miles	AQL	Oxygen, Dissolved (W)	Rural NPS	Sullivan	10280103	1
140	**2018**	**1282.00**	**E. Fk. Tebo Cr.**	**C**	**14.50**	Yes	**14.50**	**Miles**	**AQL**	**Ammonia, Total (W)**	**Municipal Point Source Discharges**	**Henry**	**10290108**	**1**
141	2006	1282.00	E. Fk. Tebo Cr.	C	14.50	No	14.50	Miles	AQL	Oxygen, Dissolved (W)	Windsor SW WWTP	Henry	10290108	1
142	2002	2593.00	Eleven Point R.	P	22.70	Yes	22.70	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Oregon	11010011	1
143	2006	2597.00	Eleven Point R.	P	11.40	Yes	11.40	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Oregon	11010011	1
144	2008	2601.00	Eleven Point R.	P	22.30	Yes	22.30	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Oregon	11010011	1
145	2002	0189.00	Elkhorn Cr.	C	21.40	No	21.40	Miles	AQL	Oxygen, Dissolved (W)	Montgomery City East WWTF	Montgomery	07110008	1
146	2006	1283.00	Elm Br.	C	3.00	Yes	3.00	Miles	AQL	Oxygen, Dissolved (W)	Windsor SE WWTP	Henry	10290108	1
147	**2018**	**4110.00**	**Engelholm Creek**	**C**	**3.00**	Yes	**3.00**	**Miles**	**SCR**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**St. Louis**	**07140101**	**1**
148	**2018**	**4110.00**	**Engelholm Creek**	**C**	**3.00**	Yes	**3.00**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**St. Louis**	**07140101**	**1**
149	2012	1704.00	Fee Fee Cr. (new)	P	1.50	Yes	1.50	Miles	AQL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis	10300200	1
150	2012	1704.00	Fee Fee Cr. (new)	P	1.50	Yes	1.50	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	10300200	1
151	2016	1704.00	Fee Fee Cr. (new)	P	1.50	Yes	1.50	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	10300200	1
152	2012	7237.00	Fellows Lake	L1	800.00	Yes	800.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Greene	10290106	1, 5
153	2016	3595.00	Fenton Cr.	P	0.50	Yes	0.50	Miles	AQL	Chloride (W)	Source Unknown	St. Louis	07140102	1
154	2012	3595.00	Fenton Cr.	P	0.50	Yes	0.50	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140102	1
155	2012	2186.00	Fishpot Cr.	P	3.50	Yes	3.50	Miles	AQL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis	07140102	1
156	2016	3220.00	Fivemile Cr.	P	5.00	No	5.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	Newton	11070207	1
157	2016	0864.00	Flat Cr.	P	23.70	Yes	23.70	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Pettis/Morgan	10300103	1
158	2006	2168.00	Flat River Cr.	C	10.00	No	10.00	Miles	AQL	Cadmium (W)	Old Lead Belt tailings	St. Francois	07140104	1
159	2012	3938.00	Flat River tributary	US	0.30	Yes	0.30	Miles	GEN	Zinc (W)	Elvins Chat Pile	St. Francois	07140104	1, 7

Row #	Year	WBID	Waterbody	Class	Imp. Size	Entire WB Impaired	WB Size	Units	IU	Pollutant	Source	County Up/Down	WBD 8	Comment
160	2010	7151.00	Forest Lake	L1	580.00	Yes	580.00	Acres	AQL	Chlorophyll-a (W)	Rural NPS	Adair	10280202	1, 4, 5
161	2016	7151.00	Forest Lake	L1	580.00	Yes	580.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Adair	10280202	1, 5
162	2010	7151.00	Forest Lake	L1	580.00	Yes	580.00	Acres	AQL	Nitrogen, Total (W)	Rural NPS	Adair	10280202	1, 4, 5
163	2010	7151.00	Forest Lake	L1	580.00	Yes	580.00	Acres	AQL	Phosphorus, Total (W)	Rural NPS	Adair	10280202	1, 4, 5
164	2016	3943.00	Foster Branch tributary	C	2.00	No	2.00	Miles	AQL	Oxygen, Dissolved (W)	Ashland WWTF	Boone	10300102	1
165	**2018**	**7324.00**	**Fourche Lake**	**L3**	**49.00**	Yes	**49.00**	**Acres**	**AQL**	**Chlorophyll-a (W)**	**Source Unknown**	**Ripley**	**11010009**	**1, 4**
166	**2018**	**7324.00**	**Fourche Lake**	**L3**	**49.00**	Yes	**49.00**	**Acres**	**AQL**	**Nitrogen, Total (W)**	**Source Unknown**	**Ripley**	**11010009**	**1, 4**
167	2006	0747.00	Fowler Cr.	C	6.00	Yes	6.00	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Boone	10300102	1
168	2010	7382.00	Foxboro Lake	L3	22.00	Yes	22.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Franklin	07140103	1
169	2008	0038.00	Fox R.	P	42.00	Yes	42.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	Clark	07110001	1
170	2014	7008.00	Fox Valley Lake	L3	89.00	Yes	89.00	Acres	AQL	Chlorophyll-a (W)	Rural NPS	Clark	07110001	1, 4
171	2014	7008.00	Fox Valley Lake	L3	89.00	Yes	89.00	Acres	AQL	Nitrogen, Total (W)	Rural NPS	Clark	07110001	1, 4
172	2010	7008.00	Fox Valley Lake	L3	89.00	Yes	89.00	Acres	AQL	Phosphorus, Total (W)	Rural NPS	Clark	07110001	1, 4
173	2002	7280.00	Frisco Lake	L3	5.00	Yes	5.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Phelps	07140102	1
174	2016	4061.00	Gailey Branch	C	3.20	Yes	3.20	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Pike	07110007	1
175	2012	1004.00	Gans Cr.	C	5.50	Yes	5.50	Miles	WBC A	Escherichia coli (W)	Rural NPS	Boone	10300102	1
176	2002	1455.00	Gasconade R.	P	264.00	Yes	264.00	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Pulaski	10290203	1, 5
177	2006	2184.00	Grand Glaize Cr.	C	4.00	Yes	4.00	Miles	AQL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis	07140102	1
178	2008	2184.00	Grand Glaize Cr.	C	4.00	Yes	4.00	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140102	1
179	2002	2184.00	Grand Glaize Cr.	C	4.00	Yes	4.00	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	St. Louis	07140102	1
180	2006	0593.00	Grand R.	P	56.00	Yes	56.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Livingston/Chariton	10280103	1, 5
181	2008	1712.00	Gravois Cr.	P	2.30	Yes	2.30	Miles	AQL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis/St. Louis City	07140101	1
182	2006	1712.00	Gravois Cr.	P	2.30	Yes	2.30	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis/St. Louis City	07140101	1
183	2006	1713.00	Gravois Cr.	C	6.00	Yes	6.00	Miles	AQL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis	07140101	1
184	2006	1713.00	Gravois Cr.	C	6.00	Yes	6.00	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101	1
185	2016	4051.00	Gravois Creek tributary	C	1.90	Yes	1.90	Miles	WBC B	Escherichia coli (W)	Municipal, Urbanized High Density Area, Urban Runoff/Storm	St. Louis	07140101	1
186	2006	1009.00	Grindstone Cr.	C	2.50	Yes	2.50	Miles	WBC A	Escherichia coli (W)	Rural NPS	Boone	10300102	1

Row #	Year	WBID	Waterbody	Class	Imp. Size	Entire WB Impaired	WB Size	Units	IU	Pollutant	Source	County Up/Down	WBD 8	Comment
187	2014	7386.00	Harrison County Lake	L1	280.00	Yes	280.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Harrison	10280101	1, 5
188	2010	7152.00	Hazel Creek Lake	L1	453.00	Yes	453.00	Acres	AQL	Chlorophyll-a (W)	Rural NPS	Adair	10280201	1, 4, 5
189	**2018**	**7152.00**	**Hazel Creek Lake**	**L1**	**453.00**	Yes	**453.00**	**Acres**	**AQL**	**Nitrogen, Total (W)**	**Nonpoint Source**	**Adair**	**10280201**	**1, 4, 5**
190	2016	2196.00	Headwater Div. Chan.	P	20.30	Yes	20.30	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Cape Girardeau	07140105	1, 5
191	2008	0848.00	Heaths Cr.	P	21.00	Yes	21.00	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Pettis/Cooper	10300103	1
192	2006	3226.00	Hickory Cr.	P	4.90	Yes	4.90	Miles	WBC A	Escherichia coli (W)	Rural NPS	Newton	11070207	1
193	2016	1007.00	Hinkson Cr.	P	7.60	Yes	7.60	Miles	WBC B	Escherichia coli (W)	Nonpoint Source	Boone	10300102	1
194	2012	1008.00	Hinkson Cr.	C	18.80	Yes	18.80	Miles	WBC A	Escherichia coli (W)	Nonpoint Source	Boone	10300102	1
195	2016	7193.00	Holden City Lake	L1	290.20	Yes	290.20	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Johnson	10300104	1, 5
196	2012	1011.00	Hominy Br.	C	1.00	Yes	1.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	Boone	10300102	1
197	**2018**	**1251.00**	**Honey Cr.**	**C**	**8.50**	Yes	**8.50**	**Miles**	**AQL**	**Oxygen, Dissolved (W)**	**Source Unknown**	**Henry**	**10290108**	**1**
198	2010	3169.00	Honey Cr.	P	16.50	Yes	16.50	Miles	WBC B	Escherichia coli (W)	Rural NPS	Lawrence	11070207	1
199	2010	3170.00	Honey Cr.	C	2.70	Yes	2.70	Miles	WBC B	Escherichia coli (W)	Rural NPS	Lawrence	11070207	1
200	2010	1348.00	Horse Cr.	P	27.70	Yes	27.70	Miles	AQL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	Vernon/Cedar	10290106	1, 8
201	2008	1348.00	Horse Cr.	P	27.70	Yes	27.70	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Vernon/Cedar	10290106	1
202	2014	3413.00	Horseshoe Cr.	C	5.80	Yes	5.80	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Lafayette/Jackson	10300101	1
203	2002	7388.00	Hough Park Lake	L3	10.00	Yes	10.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Cole	10300102	1
204	2012	7029.00	Hunnewell Lake	L3	228.00	Yes	228.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Shelby	07110004	1
205	2010	0420.00	Indian Cr.	C	3.40	Yes	3.40	Miles	AQL	Chloride (W)	Road/Bridge Runoff, Non-construction	Jackson	10300101	1
206	2002	0420.00	Indian Cr.	C	3.40	Yes	3.40	Miles	WBC A	Escherichia coli (W)	Leawood, KS WWTP	Jackson	10300101	1
207	2012	1946.00	Indian Cr.	P	1.90	Yes	1.90	Miles	AQL	Lead (S)	Doe Run Viburnum Division Lead mine	Washington	07140102	1
208	2010	1946.00	Indian Cr.	P	1.90	Yes	1.90	Miles	AQL	Zinc (S)	Doe Run Viburnum Division Lead mine	Washington	07140102	1
209	2008	7389.00	Indian Creek Community Lake	L3	185.00	Yes	185.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Livingston	10280101	1
210	2014	3223.00	Jacobs Br.	P	1.60	Yes	1.60	Miles	AQL	Cadmium (S)	Tri-State Mining District	Newton	11070207	1
211	2014	3223.00	Jacobs Br.	P	1.60	Yes	1.60	Miles	AQL	Cadmium (W)	Tri-State Mining District	Newton	11070207	1
212	2014	3223.00	Jacobs Br.	P	1.60	Yes	1.60	Miles	AQL	Lead (S)	Tri-State Mining District	Newton	11070207	1
213	2014	3223.00	Jacobs Br.	P	1.60	Yes	1.60	Miles	AQL	Zinc (S)	Tri-State Mining District	Newton	11070207	1

Row #	Year	WBID	Waterbody	Class	Imp. Size	Entire WB Impaired	WB Size	Units	IU	Pollutant	Source	County Up/Down	WBD 8	Comment
214	2012	3223.00	Jacobs Br.	P	1.60	Yes	1.60	Miles	AQL	Zinc (W)	Tri-State Mining District	Newton	11070207	1
215	2012	3207.00	Jenkins Cr.	P	2.80	Yes	2.80	Miles	WBC A	Escherichia coli (W)	Rural NPS	Jasper	11070207	1
216	2014	3208.00	Jenkins Cr.	C	4.80	Yes	4.80	Miles	WBC A	Escherichia coli (W)	Rural NPS	Newton/Jasper	11070207	1
217	2012	3205.00	Jones Cr.	P	7.50	Yes	7.50	Miles	WBC A	Escherichia coli (W)	Rural NPS	Newton/Jasper	11070207	1
218	2016	5006.00	Joplin Creek	C	3.90	Yes	3.90	Miles	AQL	Cadmium (W)	Mill Tailings	Jasper	11070207	1
219	**2018**	**5006.00**	**Joplin Creek**	**C**	**3.90**	Yes	**3.90**	**Miles**	**AQL**	**Zinc (W)**	**Mill Tailings**	**Jasper**	**11070207**	**1**
220	2014	3374.00	Jordan Cr.	P	3.80	Yes	3.80	Miles	AQL	Polycyclic Aromatic Hydrocarbons-PAHs (S)	Urban NPS	Greene	11010002	1
221	2012	3592.00	Keifer Cr.	P	1.20	Yes	1.20	Miles	AQL	Chloride (W)	Road/Bridge Runoff, Non-construction	St. Louis	07140102	1
222	2012	3592.00	Keifer Cr.	P	1.20	Yes	1.20	Miles	WBC A	Escherichia coli (W)	Rural NPS	St. Louis	07140102	1
223	2016	7657.00	Knox Village Lake	L3	3.00	Yes	3.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Jackson	10300101	1
224	2016	2171.00	Koen Cr.	C	1.00	Yes	1.00	Miles	AQL	Lead (S)	Mine Tailings	St. Francois	07140104	1
225	2016	7023.00	Labelle Lake #2	L1	98.00	Yes	98.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Lewis	07110003	1, 5
226	2016	7659.00	Lake Boutin	L3	20.00	Yes	20.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Cape Girardeau	07140105	1
227	2002	7469.00	Lake Buteo	L3	7.00	Yes	7.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Johnson	10300104	1
228	**2018**	**7049.00**	**Lake Lincoln**	**L3**	**88.00**	Yes	**88.00**	**Acres**	**AQL**	**Chlorophyll-a (W)**	**Source Unknown**	**Lincoln**	**07110008**	**1, 4**
229	2002	7436.00	Lake of the Woods	L3	3.00	Yes	3.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Boone	10300102	1
230	2008	7629.00	Lake of the Woods	UL	7.00	Yes	7.00	Acres	GEN	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Jackson	10300101	1, 7
231	2016	7132.00	Lake Paho	L3	273.00	Yes	273.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Mercer	10280102	1
232	2014	7055.00	Lake Ste. Louise	L3	71.00	Yes	71.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	St. Charles	07110009	1
233	2016	7035.00	Lake Tom Sawyer	L3	4.00	Yes	4.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Monroe	07110006	1
234	2010	7212.00	Lake Winnebago	L3	272.00	Yes	272.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Cass	10290108	1
235	2006	0847.00	Lamine R.	P	64.00	Yes	64.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Morgan/Cooper	10300103	1
236	**2018**	**3105.00**	**Lateral #2 Main Ditch**	**P**	**11.50**	Yes	**11.50**	**Miles**	**AQL**	**Ammonia, Total (W)**	**Source Unknown**	**Stoddard**	**08020204**	**1**
237	2006	3105.00	Lateral #2 Main Ditch	P	11.50	Yes	11.50	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Stoddard	08020204	1
238	2014	1529.00	L. Beaver Cr.	C	3.50	Yes	3.50	Miles	WBC A	Escherichia coli (W)	**Source Unknown**	Phelps	10290203	1
239	2008	1529.00	L. Beaver Cr.	C	3.50	Yes	3.50	Miles	AQL	Sedimentation/Siltation (S)	Smith Sand and Gravel	Phelps	10290203	1
240	2012	0422.00	L. Blue R.	P	35.10	Yes	35.10	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101	1

Row #	Year	WBID	Waterbody	Class	Imp. Size	Entire WB Impaired	WB Size	Units	IU	Pollutant	Source	County Up/Down	WBD 8	Comment
241	**2018**	**0422.00**	**L. Blue R.**	**P**	**35.10**	Yes	**35.10**	**Miles**	**SCR**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**Jackson**	**10300101**	**1**
242	2012	1003.00	L. Bonne Femme Cr.	P	9.00	Yes	9.00	Miles	WBC B	Escherichia coli (W)	Source Unknown	Boone	10300102	1
243	2006	1863.00	L. Dry Fk.	P	5.20	No	5.20	Miles	AQL	Oxygen, Dissolved (W)	Rolla SE WWTP	Phelps	07140102	1
244	2006	1864.00	L. Dry Fk.	C	4.70	No	4.70	Miles	AQL	Oxygen, Dissolved (W)	Rolla SE WWTP	Phelps	07140102	1
245	2008	1864.00	L. Dry Fk.	C	4.70	Yes	4.70	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Phelps	07140102	1
246	2006	1325.00	L. Dry Wood Cr.	P	20.50	Yes	20.50	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Vernon	10290104	1
247	2010	1326.00	L. Dry Wood Cr.	C	15.60	Yes	15.60	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Barton/Vernon	10290104	1
248	2012	3137.00	Lee Rowe Ditch	C	6.00	Yes	6.00	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Mississippi	08020201	1
249	**2018**	**7346.00**	**Lewis Lake**	**L3**	**6.00**	Yes	**6.00**	**Acres**	**HHP**	**Mercury in Fish Tissue (T)**	**Atmospheric Deposition - Toxics**	**Stoddard**	**08020204**	**1**
250	2002	7020.00	Lewistown Lake	L1	35.00	Yes	35.00	Acres	DWS	Atrazine (W)	Rural NPS	Lewis	07110002	2, 5
251	2012	3575.00	Line Cr.	C	7.00	Yes	7.00	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	Platte	10240011	1
252	**2018**	**4115.00**	**Little Antire Creek**	**C**	**4.00**	Yes	**4.00**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Nonpoint Source**	**Jefferson/St. Louis**	**07140102**	**1**
253	**2018**	**4107.00**	**Little Blue River tributary**	**C**	**5.50**	Yes	**5.50**	**Miles**	**SCR**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**Jackson**	**10300101**	**1**
254	**2018**	**4107.00**	**Little Blue River tributary**	**C**	**5.50**	Yes	**5.50**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**Jackson**	**10300101**	**1**
255	2010	3279.00	L. Lost Cr.	P	5.80	Yes	5.80	Miles	WBC B	Escherichia coli (W)	Rural NPS	Newton	11070206	1
256	2006	0623.00	L. Medicine Cr.	P	39.80	Yes	39.80	Miles	WBC B	Escherichia coli (W)	Rural NPS	Mercer/Grundy	10280103	1
257	2006	1189.00	L. Niangua R.	P	43.80	Yes	43.80	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Dallas/Camden	10290110	1
258	2006	0606.00	Locust Cr.	P	91.70	No	91.70	Miles	SCR	Escherichia coli (W)	Rural NPS	Putnam/Sullivan	10280103	1, 5
259	2006	0606.00	Locust Cr.	P	91.70	No	91.70	Miles	WBC B	Escherichia coli (W)	Rural NPS	Putnam/Sullivan	10280103	1, 5
260	2012	2763.00	Logan Cr.	P	36.00	No	36.00	Miles	AQL	Lead (S)	Sweetwater Lead Mine/Mill	Reynolds	11010007	1
261	2006	0696.00	Long Branch Cr.	C	14.80	No	14.80	Miles	AQL	Oxygen, Dissolved (W)	Atlanta WWTP	Macon	10280203	1
262	2002	7097.00	Longview Lake	L2	953.00	Yes	953.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Jackson	10300101	1
263	2008	3652.00	L. Osage R.	C	23.60	Yes	23.60	Miles	WBC B	Escherichia coli (W)	Rural NPS	Vernon	10290103	1
264	2006	3278.00	Lost Cr.	P	8.50	Yes	8.50	Miles	WBC A	Escherichia coli (W)	Rural NPS	Newton	11070206	1
265	2014	2854.00	L. St. Francis R.	P	32.40	No	32.40	Miles	AQL	Lead (S)	Catherine Lead Mine, pos. Mine La Motte	Madison	08020202	1, 5
266	2006	2814.00	Main Ditch	C	13.00	Yes	13.00	Miles	AQL	pH (W)	Poplar Bluff WWTP	Butler	11010007	1
267	2006	2814.00	Main Ditch	C	13.00	Yes	13.00	Miles	AQL	Temperature, water (W)	Channelization	Butler	11010007	1

Row #	Year	WBID	Waterbody	Class	Imp. Size	Entire WB Impaired	WB Size	Units	IU	Pollutant	Source	County Up/Down	WBD 8	Comment
268	2012	1709.00	Maline Cr.	C	0.60	Yes	0.60	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis/St. Louis City	07140101	1
269	2012	3839.00	Maline Cr.	C	0.50	Yes	0.50	Miles	AQL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis City	07140101	1
270	2016	3839.00	Maline Cr.	C	0.50	Yes	0.50	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis City	07140101	1
271	2016	7398.00	Maple Leaf Lake	L3	127.00	Yes	127.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Lafayette	10300104	1
272	2002	7033.00	Mark Twain Lake	L2	18132.00	Yes	18132.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Ralls	07110005	1, 5
273	**2018**	**4109.00**	**Martigney Creek**	**C**	**1.60**	Yes	**1.60**	**Miles**	**SCR**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**St. Louis**	**07140101**	**1**
274	**2018**	**4109.00**	**Martigney Creek**	**C**	**1.60**	Yes	**1.60**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**St. Louis**	**07140101**	**1**
275	2014	3596.00	Mattese Cr.	P	1.10	Yes	1.10	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140102	1
276	2016	1786.00	McClanahan Cr.	C	2.50	Yes	2.50	Miles	SCR	Escherichia coli (W)	Source Unknown	Perry	07140105	1
277	2016	1786.00	McClanahan Cr.	C	2.50	Yes	2.50	Miles	WBC B	Escherichia coli (W)	Source Unknown	Perry	07140105	1
278	2006	0619.00	Medicine Cr.	P	43.80	Yes	43.80	Miles	WBC B	Escherichia coli (W)	Rural NPS	Putnam/Grundy	10280103	1
279	2016	2183.00	Meramec R.	P	22.80	Yes	22.80	Miles	WBC A	Escherichia coli (W)	Source Unknown	St. Louis	07140102	1, 5
280	2008	2183.00	Meramec R.	P	22.80	Yes	22.80	Miles	AQL	Lead (S)	Old Lead belt tailings	St. Louis	07140102	1, 5
281	2010	0123.00	M. Fk. Salt R.	C	25.40	No	25.40	Miles	AQL	Oxygen, Dissolved (W)	Macon WWTP	Macon	07110006	1
282	2008	1299.00	Miami Cr.	P	19.60	Yes	19.60	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Bates	10290102	1
283	2006	0468.00	Middle Fk. Grand R.	P	27.50	Yes	27.50	Miles	WBC A	Escherichia coli (W)	Rural NPS	Worth/Gentry	10280101	1
284	2010	3262.00	Middle Indian Cr.	C	3.50	Yes	3.50	Miles	AQL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	Newton	11070208	1, 8
285	2010	3263.00	Middle Indian Cr.	P	2.20	Yes	2.20	Miles	AQL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	Newton	11070208	1, 8
286	2008	3263.00	Middle Indian Cr.	P	2.20	Yes	2.20	Miles	WBC B	Escherichia coli (W)	Rural NPS	Newton	11070208	1
287	2016	4066.00	Mill Creek	C	3.40	Yes	3.40	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101	1
288	2016	4066.00	Mill Creek	C	3.40	Yes	3.40	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101	1
289	2016	4066.00	Mill Creek	C	3.40	Yes	3.40	Miles	AQL	Oxygen, Dissolved (W)	Urban Runoff/Storm Sewers	Jackson	10300101	1
290	2014	1707.03	Mississippi R.	P	44.60	Yes	44.60	Miles	WBC B	Escherichia coli (W)	Municipal Point Source Discharges, Nonpoint Source	St. Louis/Ste. Genevieve	07140101	1, 5
291	2010	0226.00	Missouri R.	P	184.50	Yes	184.50	Miles	WBC B	Escherichia coli (W)	Municipal Point Source Discharges, Nonpoint Source	Atchison/Jackson	10240011	1, 5
292	2012	0356.00	Missouri R.	P	129.00	Yes	129.00	Miles	SCR	Escherichia coli (W)	Municipal Point Source Discharges, Nonpoint Source	Jackson/Chariton	10300101	1, 5
293	2012	0356.00	Missouri R.	P	129.00	Yes	129.00	Miles	WBC B	Escherichia coli (W)	Municipal Point Source Discharges, Nonpoint Source	Jackson/Chariton	10300101	1, 5
294	2008	1604.00	Missouri R.	P	104.50	No	104.50	Miles	WBC B	Escherichia coli (W)	Municipal Point Source Discharges, Nonpoint Source	St. Charles/St. Louis	10300200	1, 5

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295	2014	7031.00	Monroe City Lake	L1	94.00	Yes	94.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Ralls	07110007	1, 5
296	**2018**	**7301.00**	**Monsanto Lake**	**L3**	**18.00**	Yes	**18.00**	**Acres**	**AQL**	**Chlorophyll-a (W)**	**Source Unknown**	**St. Francois**	**07140104**	**1, 4, 6**
297	2016	7301.00	Monsanto Lake	L3	18.00	Yes	18.00	Acres	AQL	Nitrogen, Total (W)	Source Unknown	St. Francois	07140104	1, 4, 6
298	**2018**	**7301.00**	**Monsanto Lake**	**L3**	**18.00**	Yes	**18.00**	**Acres**	**AQL**	**Phosphorus, Total (W)**	**Source Unknown**	**St. Francois**	**07140104**	**1, 4, 6**
299	2010	7402.00	Mozingo Lake	L1	898.00	Yes	898.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Nodaway	10240013	1, 5
300	**2018**	**0853.00**	**Muddy Cr.**	**P**	**62.20**	Yes	**62.20**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Rural NPS**	**Pettis**	**10300103**	**1**
301	2016	0158.00	N. Fk. Cuivre R.	P	25.10	Yes	25.10	Miles	WBC A	Escherichia coli (W)	Rural NPS	Pike/Lincoln	07110008	1
302	**2018**	**0110.00**	**N. Fk. Salt R.**	**P**	**84.90**	Yes	**84.90**	**Miles**	**HHP**	**Mercury in Fish Tissue (T)**	**Atmospheric Deposition - Toxics**	**Shelby/Monroe**	**07110005**	**1, 5**
303	2008	3186.00	N. Fk. Spring R.	P	17.40	Yes	17.40	Miles	WBC B	Escherichia coli (W)	Rural NPS	Jasper	11070207	1
304	2008	3188.00	N. Fk. Spring R.	C	55.90	Yes	55.90	Miles	WBC B	Escherichia coli (W)	Rural NPS	Dade/Jasper	11070207	1
305	2006	3188.00	N. Fk. Spring R.	C	55.90	Yes	55.90	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Dade/Jasper	11070207	1
306	2006	1170.00	Niangua R.	P	56.00	Yes	56.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Webster/Dallas	10290110	1
307	2012	3260.00	N. Indian Cr.	P	5.20	Yes	5.20	Miles	AQL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	Newton	11070208	1, 8
308	2008	3260.00	N. Indian Cr.	P	5.20	Yes	5.20	Miles	WBC B	Escherichia coli (W)	Rural NPS	Newton	11070208	1
309	2014	0227.00	Nishnabotna R.	P	10.20	Yes	10.20	Miles	WBC B	Escherichia coli (W)	Rural NPS	Atchison	10240004	1, 5
310	**2018**	**0227.00**	**Nishnabotna R.**	**P**	**10.20**	Yes	**10.20**	**Miles**	**SCR**	**Escherichia coli (W)**	**Rural NPS**	**Atchison**	**10240004**	**1, 5**
311	2014	7316.00	Noblett Lake	L3	26.00	Yes	26.00	Acres	AQL	Chlorophyll-a (W)	Nonpoint Source	Douglas	11010006	1, 4
312	2002	7316.00	Noblett Lake	L3	26.00	Yes	26.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Douglas	11010006	1
313	2014	7316.00	Noblett Lake	L3	26.00	Yes	26.00	Acres	AQL	Phosphorus, Total (W)	Nonpoint Source	Douglas	11010006	1, 4
314	2006	0550.00	No Cr.	P	28.70	Yes	28.70	Miles	WBC B	Escherichia coli (W)	Rural NPS	Grundy/Livingston	10280102	1
315	**2018**	**0550.00**	**No Cr.**	**P**	**28.70**	Yes	**28.70**	**Miles**	**SCR**	**Escherichia coli (W)**	**Source Unknown**	**Grundy/Livingston**	**10280102**	**1**
316	2010	0550.00	No Cr.	P	28.70	Yes	28.70	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Grundy/Livingston	10280102	1
317	2010	0279.00	Nodaway R.	P	59.30	Yes	59.30	Miles	WBC B	Escherichia coli (W)	Rural NPS	Nodaway/Andrew	10240010	1
318	2016	7317.00	Norfork Lake	L2	1000.00	Yes	1000.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Ozark	11010006	1
319	2010	7109.00	North Bethany City Reservoir	L3	78.00	Yes	78.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Harrison	10280101	1
320	2014	3811.00	North Branch Wilsons Cr.	P	3.80	Yes	3.80	Miles	AQL	Zinc (S)	Urban NPS	Greene	11010002	1
321	2016	1794.00	Omete Cr.	C	1.20	Yes	1.20	Miles	SCR	Escherichia coli (W)	Source Unknown	Perry	07140105	1

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322	2016	1794.00	Omete Cr.	C	1.20	Yes	1.20	Miles	WBC B	Escherichia coli (W)	Source Unknown	Perry	07140105	1
323	**2018**	**3190.00**	**Opossum Cr.**	**C**	**6.40**	Yes	**6.40**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Rural NPS**	**Jasper**	**11070207**	**1**
324	2016	1293.00	Osage R.	P	50.70	Yes	50.70	Miles	WBC A	Escherichia coli (W)	Source Unknown	Vernon/St. Clair	10290105	1
325	2010	1293.00	Osage R.	P	50.70	Yes	50.70	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Vernon/St. Clair	10290105	1
326	2006	1373.00	Panther Cr.	C	9.70	Yes	9.70	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Polk/St. Clair	10290106	1
327	2008	2373.00	Pearson Cr.	P	8.00	Yes	8.00	Miles	AQL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	Greene	11010002	1, 8
328	2006	2373.00	Pearson Cr.	P	8.00	Yes	8.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Greene	11010002	1
329	2016	0099.00	Peno Cr.	C	14.40	Yes	14.40	Miles	AQL	Oxygen, Dissolved (W)	Northeast Correctional Center WWTP	Pike	07110007	1
330	2016	7273.00	Perry County Community Lake	L3	89.00	Yes	89.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Perry	07140105	1
331	2008	7628.00	Perry Phillips Lake	UL	32.00	Yes	32.00	Acres	GEN	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Boone	10300102	1, 7
332	2012	0215.00	Peruque Cr.	P1	9.60	Yes	9.60	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	St. Charles	07110009	1
333	2002	0218.00	Peruque Cr.	C	10.90	Yes	10.90	Miles	AQL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Nonpoint Source	Warren/St. Charles	07110009	1, 8
334	2016	0218.00	Peruque Cr.	C	10.90	Yes	10.90	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Warren/St. Charles	07110009	1
335	**2018**	**0785.00**	**Petite Saline Cr.**	**P**	**21.00**	Yes	**21.00**	**Miles**	**AQL**	**Oxygen, Dissolved (W)**	**Source Unknown**	**Cooper/Moniteau**	**10300102**	**1**
336	2010	2815.00	Pike Cr.	C	6.00	Yes	6.00	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Butler	11010007	1
337	2010	0312.00	Platte R.	P	142.40	Yes	142.40	Miles	WBC B	Escherichia coli (W)	Rural NPS	Worth/Platte	10240012	1, 5
338	2012	1327.00	Pleasant Run Cr.	C	7.60	Yes	7.60	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Vernon	10290104	1
339	2006	3120.00	Pole Cat Slough	P	12.60	Yes	12.60	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Dunklin	08020204	1
340	2014	3120.00	Pole Cat Slough	P	12.60	Yes	12.60	Miles	AQL	Temperature, water (W)	Source Unknown	Dunklin	08020204	1
341	2014	1440.00	Pomme de Terre R.	P	69.10	Yes	69.10	Miles	WBC A	Escherichia coli (W)	Rural NPS	Webster/Polk	10290107	1
342	2006	2038.00	Red Oak Cr.	C	10.00	Yes	10.00	Miles	AQL	Oxygen, Dissolved (W)	Owensville WWTP	Gasconade	07140103	1
343	**2018**	**0743.00**	**Renfro Cr.**	**C**	**1.50**	Yes	**1.50**	**Miles**	**AQL**	**Oxygen, Dissolved (W)**	**Abandoned Mine Lands and Rural NPS**	**Callaway/Boone**	**10300102**	**1**
344	2016	7204.00	Rinquelin Trail Community Lake	L3	27.00	Yes	27.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Maries	10290111	1
345	2006	1710.00	River des Peres	P	2.60	Yes	2.60	Miles	AQL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis City	07140101	1
346	2012	1710.00	River des Peres	P	2.60	Yes	2.60	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis City	07140101	1
347	2006	3972.00	River des Peres	C	13.60	Yes	13.60	Miles	AQL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis	07140101	1
348	2016	3972.00	River des Peres	C	13.60	Yes	13.60	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101	1

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349	2016	3972.00	River des Peres	C	13.60	Yes	13.60	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101	1
350	**2018**	**4111.00**	**River des Peres tributary**	**C**	**1.80**	Yes	**1.80**	**Miles**	**AQL**	**Chloride (W)**	**Urban Runoff/Storm Sewers**	**St. Louis**	**07140101**	**1**
351	**2018**	**4111.00**	**River des Peres tributary**	**C**	**1.80**	Yes	**1.80**	**Miles**	**SCR**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**St. Louis**	**07140101**	**1**
352	**2018**	**4111.00**	**River des Peres tributary**	**C**	**1.80**	Yes	**1.80**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**St. Louis**	**07140101**	**1**
353	**2018**	**4106.00**	**Rock Creek**	**C**	**6.20**	Yes	**6.20**	**Miles**	**SCR**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**Jackson/Clay**	**10300101**	**1**
354	**2018**	**4106.00**	**Rock Creek**	**C**	**6.20**	Yes	**6.20**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**Jackson/Clay**	**10300101**	**1**
355	**2018**	**3577.00**	**Sadler Br.**	**C**	**0.80**	Yes	**0.80**	**Miles**	**AQL**	**Oxygen, Dissolved (W)**	**Source Unknown**	**Polk**	**10290106**	**1**
356	2010	0594.00	Salt Cr.	C	14.90	Yes	14.90	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Chariton	10280103	1
357	2014	0893.00	Salt Fk.	P	26.70	Yes	26.70	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Saline	10300104	1
358	2012	2113.00	Salt Pine Cr.	C	1.20	Yes	1.20	Miles	AQL	Lead (S)	Barite tailings pond	Washington	07140104	1
359	2012	2113.00	Salt Pine Cr.	C	1.20	Yes	1.20	Miles	AQL	Zinc (S)	Barite tailings pond	Washington	07140104	1
360	2008	0091.00	Salt R.	P	29.00	Yes	29.00	Miles	AQL	Oxygen, Dissolved (W)	Mark Twain Lake re-regulation dam	Ralls/Pike	07110007	1, 5
361	2012	0103.00	Salt R.	P1	9.30	Yes	9.30	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Ralls	07110007	1, 5
362	2014	0103.00	Salt R.	P1	9.30	Yes	9.30	Miles	AQL	Oxygen, Dissolved (W)	Cannon Dam	Ralls	07110007	1, 5
363	2006	0655.00	S. Blackbird Cr.	C	13.00	Yes	13.00	Miles	AQL	Ammonia, Total (W)	Source Unknown	Putnam	10280201	1
364	2006	0142.00	S. Fk. Salt R.	C	40.10	No	40.10	Miles	AQL	Oxygen, Dissolved (W)	Mexico WWTP, Rural Nonpoint Source	Callaway/Audrain	07110006	1
365	2006	1249.00	S. Grand R.	P	66.80	Yes	66.80	Miles	WBC B	Escherichia coli (W)	Rural NPS	Cass/Henry	10290108	1
366	2014	3222.00	Shoal Cr.	P	50.50	No	50.50	Miles	AQL	Zinc (S)	Mill Tailings	Newton	11070207	1, 5
367	**2018**	**3244.00**	**Silver Cr.**	**P**	**1.90**	Yes	**1.90**	**Miles**	**AQL**	**Zinc (S)**	**Mill Tailings**	**Newton**	**11070207**	**1**
368	2012	3259.00	S. Indian Cr.	P	8.70	Yes	8.70	Miles	AQL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	McDonald/Newton	11070208	1, 8
369	2008	3259.00	S. Indian Cr.	P	8.70	Yes	8.70	Miles	WBC B	Escherichia coli (W)	Rural NPS	McDonald/Newton	11070208	1
370	2014	3754.00	Slater Br.	C	3.70	Yes	3.70	Miles	WBC B	Escherichia coli (W)	Nonpoint Source	Jasper	11070207	1
371	2006	0399.00	Sni-a-bar Cr.	P	36.60	Yes	36.60	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Jackson/Lafayette	10300101	1
372	2012	0224.00	Spencer Cr.	C	1.50	Yes	1.50	Miles	AQL	Chloride (W)	Road/Bridge Runoff, Non-construction	St. Charles	07110009	1
373	**2018**	**5004.00**	**Spring Branch**	**C**	**6.70**	Yes	**6.70**	**Miles**	**SCR**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**Jackson**	**10300101**	**1**
374	**2018**	**5004.00**	**Spring Branch**	**C**	**6.70**	Yes	**6.70**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**Jackson**	**10300101**	**1**
375	2016	5007.00	Spring Branch	C	3.10	No	3.10	Miles	WBC B	Escherichia coli (W)	Source Unknown	St. Louis	07140102	1

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376	2006	3160.00	Spring R.	P	61.70	Yes	61.70	Miles	WBC A	Escherichia coli (W)	Rural NPS	Lawrence/Jasper	11070207	1
377	2010	3164.00	Spring R.	P	8.80	Yes	8.80	Miles	WBC A	Escherichia coli (W)	Rural NPS	Lawrence	11070207	1
378	2010	3165.00	Spring R.	P	11.90	Yes	11.90	Miles	WBC A	Escherichia coli (W)	Rural NPS	Lawrence	11070207	1
379	**2018**	**4112.00**	**Spring River tributary**	**C**	**4.00**	Yes	**4.00**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Nonpoint Source**	**Jasper**	**11070207**	**1**
380	**2018**	**2677.00**	**Spring Valley Cr.**	**P**	**10.80**	Yes	**10.80**	**Miles**	**AQL**	**Oxygen, Dissolved (W)**	**Source Unknown**	**Shannon**	**11010008**	**1**
381	2006	3135.00	Stevenson Bayou	C	6.40	Yes	6.40	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Mississippi	08020201	1
382	2012	2835.00	St. Francis R.	P	93.10	No	93.10	Miles	CLF	Temperature, water (W)	Source Unknown	St. Francois	08020202	1
383	2006	3138.00	St. Johns Ditch	P	15.30	Yes	15.30	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	New Madrid	08020201	1
384	2006	0959.00	Straight Fk.	C	6.00	Yes	6.00	Miles	AQL	Oxygen, Dissolved (W)	Versailles WWTP	Morgan	10300102	1
385	2006	0686.00	Sugar Cr.	P	6.80	Yes	6.80	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Randolph	10280203	1
386	**2018**	**0686.00**	**Sugar Cr.**	**P**	**6.80**	Yes	**6.80**	**Miles**	**AQL**	**Sulfate + Chloride (W)**	**Source Unknown**	**Randolph**	**10280203**	**1**
387	**2018**	**4108.00**	**Sugar Creek**	**C**	**1.80**	Yes	**1.80**	**Miles**	**SCR**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**St. Louis**	**07140101**	**1**
388	**2018**	**4108.00**	**Sugar Creek**	**C**	**1.80**	Yes	**1.80**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**St. Louis**	**07140101**	**1**
389	**2018**	**4117.00**	**Sugar Creek**	**C**	**3.60**	Yes	**3.60**	**Miles**	**SCR**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**St. Louis**	**07140102**	**1**
390	**2018**	**4117.00**	**Sugar Creek**	**C**	**3.60**	Yes	**3.60**	**Miles**	**WBC B**	**Escherichia coli (W)**	**Urban Runoff/Storm Sewers**	**St. Louis**	**07140102**	**1**
391	2014	7166.00	Sugar Creek Lake	L1	308.00	Yes	308.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Randolph	10280203	1, 5
392	2006	7399.00	Sunset Lake	L3	6.00	Yes	6.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Cole	10300102	1
393	2002	7313.00	Table Rock Lake	L2	41747.00	No	41747.00	Acres	AQL	Chlorophyll-a (W)	Municipal Point Source Discharges, Nonpoint Source	Stone	11010001	1, 4
394	2002	7313.00	Table Rock Lake	L2	41747.00	No	41747.00	Acres	AQL	Nitrogen, Total (W)	Municipal Point Source Discharges, Nonpoint Source	Stone	11010001	1, 4
395	2002	7313.00	Table Rock Lake	L2	41747.00	Yes	41747.00	Acres	AQL	Nutrient/Eutrophication Biol. Indicators (W)	Municipal Point Source Discharges, Nonpoint Source	Stone	11010001	1, 4
396	2016	7352.00	Thirtyfour Corner Blue Hole	L3	9.00	Yes	9.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Mississippi	08010100	1
397	2008	0549.00	Thompson R.	P	70.60	No	70.60	Miles	WBC B	Escherichia coli (W)	Rural NPS	Harrison	10280102	1, 5
398	2012	3243.00	Thurman Cr.	P	3.00	Yes	3.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	Newton	11070207	1
399	**2018**	**2114.00**	**Trib. Old Mines Cr.**	**C**	**1.50**	Yes	**1.50**	**Miles**	**AQL**	**Lead (S)**	**Barite tailings pond**	**Washington**	**07140104**	**1**
400	2010	2114.00	Trib. Old Mines Cr.	C	1.50	Yes	1.50	Miles	AQL	Sedimentation/Siltation (S)	Barite tailings pond	Washington	07140104	1
401	**2018**	**2114.00**	**Trib. Old Mines Cr.**	**C**	**1.50**	Yes	**1.50**	**Miles**	**AQL**	**Zinc (S)**	**Barite tailings pond**	**Washington**	**07140104**	**1**
402	2010	1420.00	Trib. to Goose Cr.	C	3.00	Yes	3.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	Lawrence	10290106	1

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403	2006	3490.00	Trib. to L. Muddy Cr.	C	1.00	Yes	1.00	Miles	AQL	Chloride (W)	Tyson Foods	Pettis	10300103	1
404	2014	3981.00	Trib. to Shoal Cr.	US	1.56	Yes	1.56	Miles	GEN	Cadmium (W)	Tanyard Hollow Pits	Jasper/Newton	11070207	1, 7
405	2014	3981.00	Trib. to Shoal Cr.	US	1.56	Yes	1.56	Miles	GEN	Zinc (W)	Tanyard Hollow Pits	Jasper/Newton	11070207	1, 7
406	2014	3982.00	Trib. to Shoal Cr.	US	2.20	Yes	2.20	Miles	GEN	Zinc (W)	Maiden Lane Pits	Jasper/Newton	11070207	1, 7
407	2014	3983.00	Trib. to Turkey Cr.	US	2.90	Yes	2.90	Miles	GEN	Cadmium (S)	Abandoned Smelter Site	Jasper	11070207	1, 7
408	2016	3983.00	Trib. to Turkey Cr.	US	2.90	Yes	2.90	Miles	GEN	Cadmium (W)	Abandoned Smelter Site	Jasper	11070207	1, 7
409	2014	3983.00	Trib. to Turkey Cr.	US	2.90	Yes	2.90	Miles	GEN	Lead (S)	Abandoned Smelter Site	Jasper	11070207	1, 7
410	2014	3983.00	Trib. to Turkey Cr.	US	2.90	Yes	2.90	Miles	GEN	Zinc (S)	Abandoned Smelter Site	Jasper	11070207	1, 7
411	2014	3983.00	Trib. to Turkey Cr.	US	2.90	Yes	2.90	Miles	GEN	Zinc (W)	Abandoned Smelter Site	Jasper	11070207	1, 7
412	2016	3984.00	Trib. to Turkey Cr.	US	2.20	Yes	2.20	Miles	GEN	Cadmium (W)	Mill Tailings	Jasper	11070207	1, 7
413	2014	3984.00	Trib. to Turkey Cr.	US	2.20	Yes	2.20	Miles	GEN	Zinc (W)	Leadwood Hollow pits	Jasper	11070207	1, 7
414	2014	3985.00	Trib. to Turkey Cr.	US	1.60	Yes	1.60	Miles	GEN	Zinc (W)	Chitwood Hollow pits	Jasper	11070207	1, 7
415	2006	0956.00	Trib. to Willow Fk.	C	0.50	Yes	0.50	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Moniteau	10300102	1
416	2006	3589.00	Trib. to Wolf Cr.	C	1.50	Yes	1.50	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	St. Francois	08020202	2
417	2006	0074.00	Troublesome Cr.	C	41.30	No	41.30	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Knox	07110003	1
418	2012	0074.00	Troublesome Cr.	C	41.30	Yes	41.30	Miles	AQL	Sedimentation/Siltation (S)	Habitat Mod. - other than Hydromod.	Knox/Marion	07110003	1
419	2016	3174.00	Truitt Cr.	P	1.50	Yes	1.50	Miles	WBC B	Escherichia coli (W)	Rural NPS	Lawrence	11070207	1
420	2012	3175.00	Truitt Cr.	C	6.40	Yes	6.40	Miles	SCR	Escherichia coli (W)	Rural NPS	Lawrence	11070207	1
421	2012	0751.00	Turkey Cr.	C	6.30	Yes	6.30	Miles	WBC A	Escherichia coli (W)	Source Unknown	Boone	10300102	1
422	**2018**	**2985.00**	**Turkey Cr.**	**C**	**3.10**	No	**3.10**	**Miles**	**AQL**	**Ammonia, Total (W)**	**Puxico WWTF**	**Stoddard**	**08020203**	**1**
423	**2018**	**2985.00**	**Turkey Cr.**	**C**	**3.10**	No	**3.10**	**Miles**	**AQL**	**Oxygen, Dissolved (W)**	**Puxico WWTF**	**Stoddard**	**08020203**	**1**
424	2006	3216.00	Turkey Cr.	P	7.70	Yes	7.70	Miles	AQL	Cadmium (S)	Tri-State Mining District	Jasper	11070207	1
425	2006	3216.00	Turkey Cr.	P	7.70	Yes	7.70	Miles	AQL	Cadmium (W)	Tri-State Mining District	Jasper	11070207	1
426	2006	3216.00	Turkey Cr.	P	7.70	Yes	7.70	Miles	WBC B	Escherichia coli (W)	Nonpoint Source	Jasper	11070207	1
427	2008	3216.00	Turkey Cr.	P	7.70	Yes	7.70	Miles	AQL	Lead (S)	Tri-State Mining District	Jasper	11070207	1
428	2006	3216.00	Turkey Cr.	P	7.70	Yes	7.70	Miles	AQL	Zinc (S)	Tri-State Mining District	Jasper	11070207	1
429	2006	3217.00	Turkey Cr.	P	6.10	Yes	6.10	Miles	AQL	Cadmium (S)	Tri-State Mining District	Jasper	11070207	1

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430	2006	3217.00	Turkey Cr.	P	6.10	Yes	6.10	Miles	WBC A	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jasper	11070207	1
431	2006	3217.00	Turkey Cr.	P	6.10	Yes	6.10	Miles	AQL	Lead (S)	Tri-State Mining District	Jasper	11070207	1
432	2006	3217.00	Turkey Cr.	P	6.10	Yes	6.10	Miles	AQL	Zinc (S)	Tri-State Mining District	Jasper	11070207	1
433	2016	3282.00	Turkey Cr.	P	2.40	Yes	2.40	Miles	AQL	Cadmium (S)	Bonne Terre chat pile	St. Francois	07140104	1
434	2006	3282.00	Turkey Cr.	P	2.40	Yes	2.40	Miles	AQL	Cadmium (W)	Bonne Terre chat pile	St. Francois	07140104	1
435	2016	3282.00	Turkey Cr.	P	2.40	Yes	2.40	Miles	AQL	Copper (S)	Bonne Terre chat pile	St. Francois	07140104	1
436	2016	3282.00	Turkey Cr.	P	2.40	Yes	2.40	Miles	AQL	Lead (S)	Bonne Terre chat pile	St. Francois	07140104	1
437	2006	3282.00	Turkey Cr.	P	2.40	Yes	2.40	Miles	AQL	Lead (W)	Bonne Terre chat pile	St. Francois	07140104	1
438	2016	3282.00	Turkey Cr.	P	2.40	Yes	2.40	Miles	AQL	Nickel (S)	Bonne Terre chat pile	St. Francois	07140104	1
439	2016	3282.00	Turkey Cr.	P	2.40	Yes	2.40	Miles	AQL	Zinc (S)	Bonne Terre chat pile	St. Francois	07140104	1
440	2006	3282.00	Turkey Cr.	P	2.40	No	2.40	Miles	AQL	Zinc (W)	Bonne Terre chat pile	St. Francois	07140104	1
441	2010	1414.00	Turnback Cr.	P	19.90	Yes	19.90	Miles	WBC A	Escherichia coli (W)	Rural NPS	Lawrence/Dade	10290106	1
442	2016	4079.00	Twomile Creek	C	5.60	Yes	5.60	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101	1
443	2016	7099.00	Unity Village Lake #2	L1	26.00	Yes	26.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Jackson	10300101	1, 5
444	2006	1708.00	Watkins Cr.	C	1.40	Yes	1.40	Miles	AQL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis/St. Louis City	07140101	1
445	2016	4097.00	Watkins Creek tributary	C	1.20	Yes	1.20	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101	1
446	2016	4097.00	Watkins Creek tributary	C	1.20	Yes	1.20	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101	1
447	2016	4098.00	Watkins Creek tributary	C	1.20	Yes	1.20	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101	1
448	2016	4098.00	Watkins Creek tributary	C	1.20	Yes	1.20	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101	1
449	2012	7071.00	Weatherby Lake	L3	185.00	Yes	185.00	Acres	AQL	Chlorophyll-a (W)	Urban Runoff/Storm Sewers	Platte	10240011	1, 4
450	2012	7071.00	Weatherby Lake	L3	185.00	Yes	185.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Platte	10240011	1
451	2010	7071.00	Weatherby Lake	L3	185.00	Yes	185.00	Acres	AQL	Nitrogen, Total (W)	Urban Runoff/Storm Sewers	Platte	10240011	1, 4
452	2014	7071.00	Weatherby Lake	L3	185.00	Yes	185.00	Acres	AQL	Phosphorus, Total (W)	Urban Runoff/Storm Sewers	Platte	10240011	1, 4
453	2006	0560.00	Weldon R.	P	43.40	Yes	43.40	Miles	WBC B	Escherichia coli (W)	Rural NPS	Mercer/Grundy	10280102	1
454	2008	2755.00	W. Fk. Black R.	P	32.30	No	32.30	Miles	AQL	Lead (S)	West Fork Lead Mine/Mill	Reynolds	11010007	1
455	2008	2755.00	W. Fk. Black R.	P	32.30	No	32.30	Miles	AQL	Nickel (S)	West Fork Lead Mine/Mill	Reynolds	11010007	1
457	2006	1317.00	W. Fk. Dry Wood Cr.	C	8.10	Yes	8.10	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	Vernon	10290104	1

Row #	Year	WBID	Waterbody	Class	Imp. Size	Entire WB Impaired	WB Size	Units	IU	Pollutant	Source	County Up/Down	WBD 8	Comment
458	2008	1504.00	Whetstone Cr.	P	12.20	Yes	12.20	Miles	AQL	Oxygen, Dissolved (W)	Rural NPS	Wright	10290201	1
459	2010	3182.00	White Oak Cr.	C	18.00	Yes	18.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Lawrence/Jasper	11070207	1
460	2012	1700.00	Wildhorse Cr.	C	3.90	Yes	3.90	Miles	WBC B	Escherichia coli (W)	Rural, Residential Areas	St. Louis	10300200	1
461	2010	3171.00	Williams Cr.	P	1.00	Yes	1.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Lawrence	11070207	1
462	2010	3172.00	Williams Cr.	P	8.50	Yes	8.50	Miles	WBC A	Escherichia coli (W)	Rural NPS	Lawrence	11070207	1
463	2012	3594.00	Williams Cr.	P	1.00	Yes	1.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	St. Louis	07140102	1
464	2016	3594.00	Williams Cr.	P	1.00	Yes	1.00	Miles	SCR	Escherichia coli (W)	Rural NPS	St. Louis	07140102	1
465	2014	3280.00	Willow Br.	P	2.20	Yes	2.20	Miles	AQL	Cadmium (S)	Mill Tailings	Newton	11070206	1
466	2010	3280.00	Willow Br.	P	2.20	Yes	2.20	Miles	WBC B	Escherichia coli (W)	Rural NPS	Newton	11070206	1
467	2014	3280.00	Willow Br.	P	2.20	Yes	2.20	Miles	AQL	Zinc (S)	Mill Tailings	Newton	11070206	1
468	2006	0955.00	Willow Fk.	C	6.80	Yes	6.80	Miles	AQL	Oxygen, Dissolved (W)	Tipton WWTP	Moniteau	10300102	1
469	2006	2375.00	Wilsons Cr.	P	14.00	Yes	14.00	Miles	WBC B	Escherichia coli (W)	Nonpoint Source	Greene/Christian	11010002	1
470	2014	2375.00	Wilsons Cr.	P	14.00	No	14.00	Miles	AQL	Polycyclic Aromatic Hydrocarbons-PAHs (S)	Nonpoint Source	Greene	11010002	1
471	2014	2429.00	Woods Fk.	C	5.50	Yes	5.50	Miles	AQL	Fishes Bioassessments/ Unknown (W)	Source Unknown	Christian	11010003	1, 8

Key To List:

Bolded rows are new listings for the 2018 listing cycle

Row #: Row number that is not unique to any water, but is simply a count of the rows (listings)

Year: Year this waterbody/pollutant pair was added to the 303(d) List

WBID: Unique waterbody identification number. Clicking the link will bring up a WQA Public Search webpage with the available data for that WBID

Waterbody: Name of the waterbody.

Class: Waterbody Classification in Missouri State Water Quality Standards: P - Permanently Flowing Waters, C - Intermittently Flowing Waters, L1 - Drinking Water Reservoirs, L2 - Large Multi-purpose Lakes, L3 - Other Recreational Lakes, US - Unclassified Stream, UL - Unclassified Lake

Imp. Size: Size of the impaired portion of the waterbody segment

Entire WB Impaired: Yes - the entire waterbody is imapired; No: Only a portion of the waterbody is impaired

WB Size: Size of entire waterbody segment

IU: Impaired Use

AQL - Protection of Aquatic Life ; CLF - Cool-Water Fishery ; DWS - Drinking Water Supply ; GEN - General Criteria ; HHP - Human-Health Protection (Fish Consumption) ; SCR - Secondary Contact Recreation WBC A - Whole Body Contact Recreation A (Designated Public Swimming Areas) ; WBC B - Whole Body Contact Recreation B (Those areas not considered WBC A)

Pollutant: The reason\cause the water is impaired

Media Indicators: (W) - The pollutant is in the water ; (S) - The pollutant is in the sediment ; (T) - The pollutant is in the tissue of an organism ; If no media indicator is shown the pollutant is in the water

Source: The source of the pollutant causing the impairment

County Up/Down: The county of the upstream end and downstream end of the segment that is impaired. Clicking the link will bring up a map viewer displaying the location of the impaired portion of the waterbody.

Comment:

1 - 2018 Assessment indicates impairment
2 - Assessment shows existing data is insufficient to show "good cause" for delisting
3 - Biological data does not support delisting
4 - Nutrient related impairment
5 - Water is a Public Drinking Water Supply
6 - Monsanto Lake is part of the group of lakes known as the St. Joe State Park Lakes
7 - General Use pertaining to Aquatic Life
8 - These waters are listed as either "Aquatic Macroinvertebrate Bioassessment/Unknown (W)" or "Fishes Bioassessment/Unknown (W)" . These waters lack the necessary information to point to a discrete pollutant and do not show signs of habitat impairment. Since we currently cannot point to a specific pollutant as the cause, we are listing the observed effect as the reason the waters are impaired.

Missouri Department of Natural Resources, Water Protection Program, (573)751-1300, www.dnr.mo.gov

http://www.dnr.mo.gov/mocwis_public/wqa/waterbodySearch.do
http://dnr.mo.gov/env/esp/wqm/biologicalassessments.htm

10/18/2018

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APPENDIX Q

ENDANGERED SPECIES AND CRITICAL HABITAT DOCUMENTATION

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IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

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Location

Boone County, Missouri



Local office

Missouri Ecological Services Field Office

(573) 234-2132
(573) 234-2181

101 Park Deville Drive
Suite A
Columbia, MO 65203-0057

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Gray Bat Myotis grisescens — Endangered
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/6329

Indiana Bat Myotis sodalis — Endangered
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/5949

Northern Long-eared Bat Myotis septentrionalis — Threatened
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/9045

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

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Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ

below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

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NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Blue-winged Warbler *Vermivora pinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 1 to Jun 30
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Henslow's Sparrow *Ammodramus henslowii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3941	Breeds May 1 to Aug 31

Kentucky Warbler Oporornis formosus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Le Conte's Sparrow Ammodramus leconteii This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Lesser Yellowlegs Tringa flavipes This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Semipalmated Sandpiper Calidris pusilla This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Smith's Longspur Calcarius pictus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

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Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

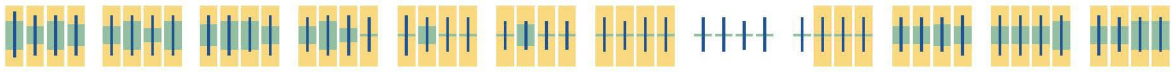
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

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■ probability of presence ■ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

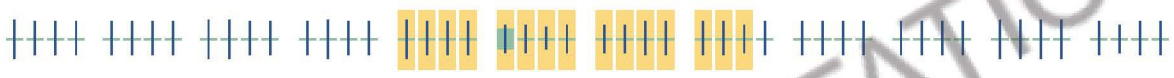
Bald Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



Blue-winged Warbler
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



Eastern Whip-poor-will
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Henslow's Sparrow
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Kentucky Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



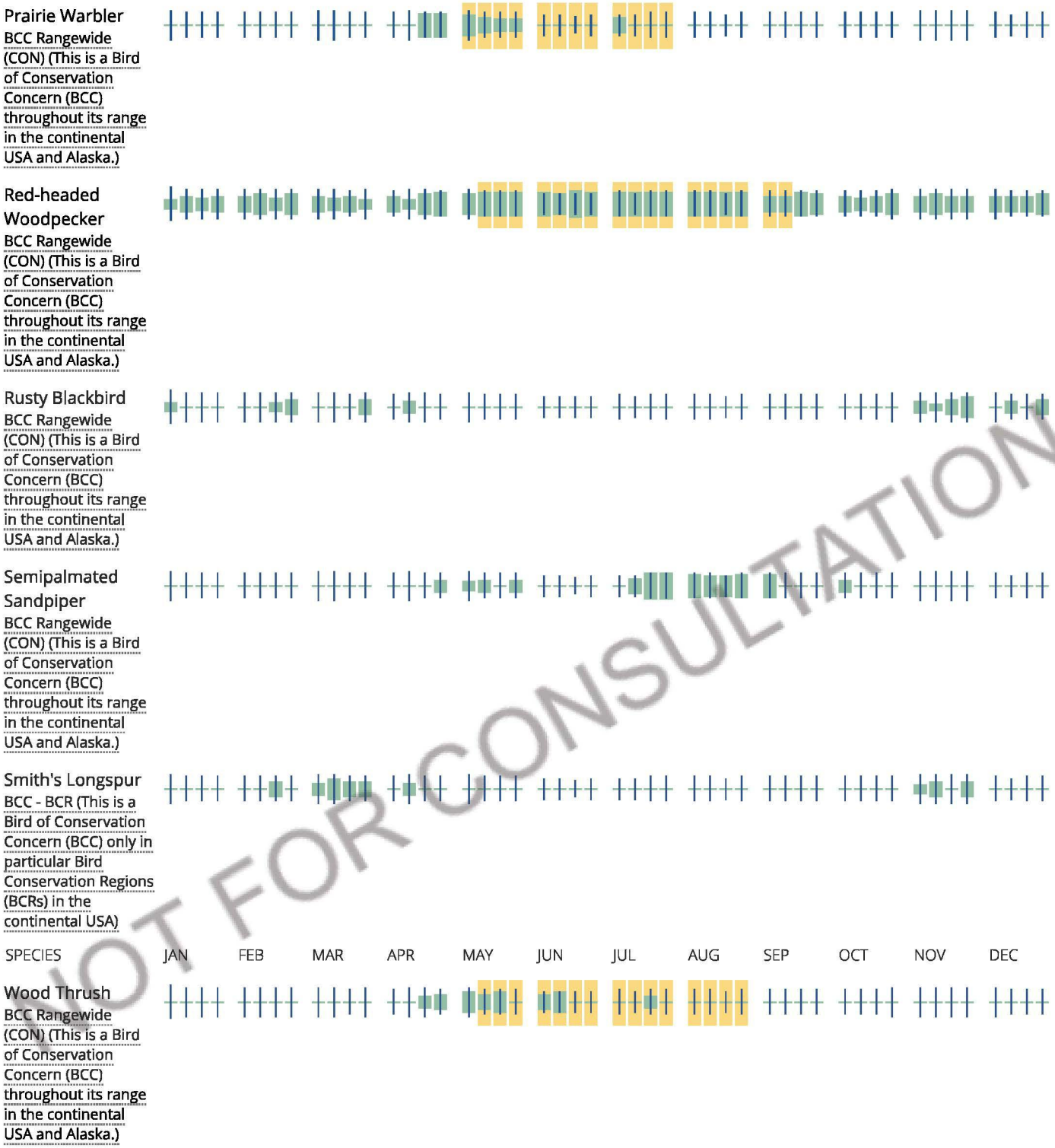
Le Conte's Sparrow
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



Lesser Yellowlegs
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



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Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review.

NOT FOR CONSULTATION

Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

NOT FOR CONSULTATION

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

NOT FOR CONSULTATION

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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Columbia Public Schools
Roseta Avenue Learning Center Accessibility, Safety and Security Improvements
Proposal Form

BID TIME: 2:00pm local time.

BID DATE: Tuesday January 19th, 2021

FROM: _____

_____

_____

TO: Columbia Public School District

FOR: Roseta Avenue Learning Center Accessibility, Safety and Security Improvements

Hereinafter called the "Work".

1. The Undersigned, having examined and being familiar with the local conditions affecting the Work and with the contract documents, including " Instructions to Bidders", "Proposal Form", "Special Conditions", "Contractor Agreement", "Scope of Work" and "Drawings" Including Addenda _____ Through _____ , as issued by Columbia Public School District, hereby proposes to furnish and pay for all appropriate sales and use taxes, insurance, bonds, labor, materials, tools, equipment, services, and related items required for the performance and completion of the work as follows:

BASE BID:

The Sum of _____ dollars ($_____)

2. In submitting this bid, it is understood that the right is reserved by the owner, to reject any and all bids and it is agreed that the bids may not be withdrawn for a period of sixty (60) days from the specified time for receiving bids. The Owner reserves the right to waive any informality or irregularity in any bid received and to award a contract in any manner deemed to Owner, at his sole discretion to be in his best interest.

3. Bidder proposes to complete all Work according to the Instructions to Bidders.

4. The Bidder is requested to define the number of calendar days to achieve final completion of this project if different than what is defined in 00 22 14 Supplementary Instructions to Bidders: _____. See 00 72 01 Supplementary Conditions for additional schedule requirements.

5. The bidder certifies that the following proposed subcontractors will be used in the performance of the Work (if none, so state):

Name of Subcontractor Work to be Performed

1. Plumbing_____
2. Doors and Hardware_____
3. Electrical_____
4. Demolition_____
5. Painter_____
6. Flooring _____
7. Casework_____
8. Concrete_____
9. Drywall_____
10. Masonry_____
11. Asphalt_____
12. Excavation/Earthwork_____
13. Security Storefront_____
14. Storefront Systems_____

6. The bidder hereby certifies that this proposal is genuine and is not made in the interest of 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 or corporation. That the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham proposal; that the bidder has not solicited or induced any person, firm or corporation to refrain from bidding; that the bidder has not sought by collusion or otherwise to obtain for themselves any advantage over any other bidder or over the owner, and that the bidder will not discriminate against any corporation, firm, company, employee or applicant for employment for services because of sex, race, creed, color or national origin in connection with the performance of Work.

Signed by:_____ Title: _____

Dated this _____ day of _____, 20_____.

Organization type: Individual ____ Partnership ____ Corporation _____

_____ _____
Name/title of officer Firm or partnership name

_____
Address for communication

_____ _____
Telephone Fax

If a Corporation:

1. Incorporated under the laws of the state of _____.

2. Licensed to do business in the State of Missouri? Yes _____ No _____.

(Each bidder must complete the proposal form by signing it in the proper signature lines above and by supplying the required information called for in connection with the signatures. The information is necessary for the proper preparation of a contract)

Mail or deliver the proposal form to:
Ms. Dana Reynolds, Purchasing Agent
Administration Building
1818 W. Worley
Columbia, Missouri, 65203

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AIA® Document A310™ – 2010

Bid Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)
Columbia Public Schools
1818 West Worley
Columbia, Missouri 65203

BOND AMOUNT: $

PROJECT:
(Name, location or address, and Project number, if any)
CPS Roseta Avenue Learning Center Accessibility, Safety and Security Improvements
Columbia, Missouri

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Init.
/

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User Notes: (3B9ADA35)

Signed and sealed this day of ,

	(Contractor as Principal) *(Seal)*
(Witness)	*(Title)*
	(Surety) *(Seal)*
(Witness)	*(Title)*

Init.
/

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User Notes: (3B9ADA35)

REQUEST FOR SUBSTITUTION (RFS)

Substitutions prior to Bid Opening:
(Minimum of 10 days prior to receipt of bids as per Article 3.3 - Instructions to Bidders)
Project Title: Columbia Public Schools:
Roseta Avenue Learning Center Accessibility, Safety
and Security Improvements Project Number: 201621.51

Architect / Engineer: Chris Davis, AIA

Bidder/Contractor Requesting Substitution:

Bidder / Contractor hereby requests acceptance of the following product or systems as a substitution in accord with the provisions described in Division One of the bidding documents:

Specified Product or System:

Specification Section Number:

Supporting Data:

☐ Product data for proposed substitution is attached. (Include description of product, standards, performance and test data.)

☐ Sample ☐ Sample sent upon request

QUALITY COMPARISON

	Specified Product	Substitution Requested
Name Brand:		
Catalog Number:		
Manufacturer:		
Vendor:		

PREVIOUS INSTALLATIONS

Project: Architect/Engineer:

Location: Date Installed:

SIGNIFICANT VARIATIONS:

REASON FOR SUBSTITUTION:

DOES PROPOSED SUBSTITUTION AFFECT OTHER PARTS OF WORK:

☐ Yes ☐ No

If Yes, Explain

SUBSTITUTION REQUIRES DIMENSIONAL REVISION OR REDESIGN OF STRUCTURE OR A&E WORK:

☐ Yes ☐ No

Bidder's/Contractors Statement of Conformance of Proposed Substitution with Bidding Documents:
I/we have investigated the proposed substitution. I/we believe that it is equal or superior in all respects to specified product, except as stated above; that It will provide the same warranty as specified product; that I/we have included complete implications of the substitution; that I/we will pay redesign and other costs caused by the substitution which subsequently become apparent; and that I/we will pay costs to modify other parts of the Work as may be needed, to make all parts of the Work complete and functioning resulting from the substitution.

Bidder/Contractor: Date:

Signature:

REVIEW AND ACTION

☐ Resubmit substitution request with the following additional information:

☐ Substitution is accepted

☐ Substitution is accepted with the flowing comments:

☐ Substitution is not accepted

Architect / Engineer: Date:

SECTION 00 43 43

STATE WAGE RATE REQUIREMENTS AND DETERMINATION SCHEDULE

1.01 Not less than the prevailing hourly rate of wages, as set out in the wage order attached to and made part of the specification for work under the contract, must be paid to all workers performing work un the contract.

1.02 The contractor will forfeit a penalty to the contracting public body of $100 per day (or portion of a day) for each worker that is paid less than the prevailing rate for any work done under the contract by the contractor or by any subcontractor.

1.03 The contractor and all subcontractors to the contract must require all on-site employees to complete the ten-hour construction safety training program required under Section 292.675, RSMo, if they have not previously completed the program and have documentation of having done so.

1.04 The contractor will forfeit a penalty to the contracting public body of $2500 plus an additional $100 for each employee employed by the contractor or subcontractor, for each calendar day, or portion thereof, such employee is employed without the required training.

1.05 Forms:

A. Copies of the following forms are included as part of this Section:
   1. Certificate from Matt Cowell, Division of Labor Standards, State of Missouri.
   2. Annual Wage Order No. 27,
   3. To be submitted before work begins: Project Notification-Contractor Information, PW-2 (05-16).
   4. To be submitted before final payment: Affidavit Compliance with the Prevailing Wage Law. PW-4 (07-14).

END OF SECTION

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Missouri
Division of Labor Standards
WAGE AND HOUR SECTION

MICHAEL L. PARSON, Governor

Annual Wage Order No. 27

Section 010
BOONE COUNTY

In accordance with Section 290.262 RSMo 2000, within thirty (30) days after a certified copy of this Annual Wage Order has been filed with the Secretary of State as indicated below, any person who may be affected by this Annual Wage Order may object by filing an objection in triplicate with the Labor and Industrial Relations Commission, P.O. Box 599, Jefferson City, MO 65102-0599. Such objections must set forth in writing the specific grounds of objection. Each objection shall certify that a copy has been furnished to the Division of Labor Standards, P.O. Box 449, Jefferson City, MO 65102-0449 pursuant to 8 CSR 20-5.010(1). A certified copy of the Annual Wage Order has been filed with the Secretary of State of Missouri.

Original Signed by
Taylor Burks, Director
Division of Labor Standards

Filed With Secretary of State: **March 10, 2020**

Last Date Objections May Be Filed: **April 9, 2020**

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	$52.88
Boilermaker	*$27.06
Bricklayer	**$49.54**
Carpenter	**$44.27**
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	$41.89
Plasterer	
Communications Technician	$51.30
Electrician (Inside Wireman)	$51.37
Electrician Outside Lineman	$73.26
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	*$27.06
Glazier	**$41.33**
Ironworker	$58.10
Laborer	$39.16
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	$50.20
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	*$27.06
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	$39.03
Plumber	**$56.87**
Pipe Fitter	
Roofer	$49.42
Sheet Metal Worker	**$52.30**
Sprinkler Fitter	**$44.65**
Truck Driver	*$27.06
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

*The Division of Labor Standards received less than 1,000 reportable hours for this occupational title.
Public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.
**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title.

Heavy Construction Rates for
BOONE County

Section 010

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	$49.56
Millwright	
Pile Driver	
Electrician (Outside Lineman)	$73.26
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	$43.60
General Laborer	
Skilled Laborer	
Operating Engineer	$55.90
Group I	
Group II	
Group III	
Group IV	
Truck Driver	$43.10
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

Use Heavy Construction Rates on Highway and Heavy construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(3).

Use Building Construction Rates on Building construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(2).

If a worker is performing work on a heavy construction project within an occupational title that is not listed on the Heavy Construction Rate Sheet, use the rate for that occupational title as shown on the Building Construction Rate Sheet.

*The Division of Labor Standards received less than 1,000 reportable hours for this occupational title. Public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.

**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title.

OVERTIME
and
HOLIDAYS

OVERTIME

For all work performed on a Sunday or a holiday, not less than twice (2x) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work.

For all overtime work performed, not less than one and one-half (1½) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work or contractual obligation. For purposes of this subdivision, **"overtime work"** shall include work that exceeds ten hours in one day and work in excess of forty hours in one calendar week; and

A thirty-minute lunch period on each calendar day shall be allowed for each worker on a public works project, provided that such time shall not be considered as time worked.

HOLIDAYS

January First;
The last Monday in May;
July Fourth;
The first Monday in September;
November Eleventh;
The fourth Thursday in November; and
December Twenty-Fifth;

If any holiday falls on a Sunday, the following Monday shall be considered a holiday.

DIVISION OF LABOR STANDARDS

MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

PREVAILING WAGE PROJECT NOTIFICATION – CONTRACTOR INFORMATION

☐ New ☐ Update

The information below is requested pursuant to Sections 290.210 through 290.340, RSMo.

1. Date of Notification		2. Annual Wage Order Number Included in Bid Specifications
3. Popular or Descriptive Name of Project		
4. Estimated Project Cost of Completion *(total construction contracts to be awarded)* $		
5. Exact Location of Project County		City
6. Official Name of Public Body or Agency		
7. Name of Contact Person		8. Phone Number *(include area code)*
9. Address		
10. Email Address		Website
11. Contract Award Date	12. Estimated Date of Project Completion	13. Will There Be Any Federal Funds Used in this Contract? ☐ Yes ☐ No

14. Contractor Information Notification

General Contractor:

Name _____

Address _____

City _____ State _____ ZIP _____

Phone Number _____ Email Address _____

Type of Craftsmen Needed by Project _____

Scope of Work _____

List all Subcontractors:

1. Name _____

Address _____

City _____ State _____ ZIP _____

Phone Number _____ Email Address _____

Type of Craftsmen Needed by Project _____

Scope of Work _____

2. Name _____

Address _____

City _____ State _____ ZIP _____

Phone Number _____ Email Address _____

Type of Craftsmen Needed by Project _____

Scope of Work _____

3. Name _____

Address _____

City _____ State _____ ZIP _____

Phone Number _____ Email Address _____

Type of Craftsmen Needed by Project _____

Scope of Work _____

(Subcontractors continued)

4. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

5. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

6. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

7. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

8. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

9. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

The state of Missouri requires workers on public works projects be paid the prevailing wage. Public bodies have duties as required under Section 290.210 - 290.340, RSMo.

Mail, Fax, or Email completed form to:

DIVISION OF LABOR STANDARDS
Attn: Prevailing Wage Section
P.O. Box 449, Jefferson City, MO 65102-0449
Phone: 573-751-3403 Fax: 573-751-3721
Email: prevailingwage@labor.mo.gov
Website: www.labor.mo.gov/DLS

SUBMIT

Missouri Department of Labor and Industrial Relations is an equal opportunity employer/program.
TDD/TTY: 800-735-2966 Relay Missouri: 711

DIVISION OF LABOR STANDARDS

MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

AFFIDAVIT
COMPLIANCE WITH THE PREVAILING WAGE LAW

I, _____, upon being duly sworn upon my oath state that: (1) I am the
(Name)

_____ of _____; (2) all requirements of
(Title) *(Name of Company)*

§§ 290.210 to 290.340, RSMo, pertaining to the payment of wages to workers employed on public works projects have been fully satisfied **with regard to this company's work on** _____;
(Name of Project)

(3) I have reviewed and am familiar with the prevailing wage rules in 8 CSR 30-3.010 to 8 CSR 30-3.060; (4) based upon my knowledge of these rules, including the occupational titles set out in 8 CSR 30-3.060, I have completed full and accurate records clearly indicating (a) the names, occupations, and crafts of every worker employed by this company in connection with this project together with an accurate record of the number of hours worked by each worker and the actual wages paid for each class or type of work performed, (b) the payroll deductions that have been made for each worker, and (c) the amounts paid to provide fringe benefits, if any, for each worker; (5) the amounts paid to provide fringe benefits, if any, were irrevocably made to a fund, plan, or program on behalf of the workers; (6) these payroll records are kept and have been provided for inspection to the authorized representative of the contracting public body and will be available, as often as may be necessary, to such body and the Missouri Department of Labor and Industrial Relations; (7) such records shall not be destroyed or removed from the state for one year following the completion of this **company's work on this project;** and (8) there has been no exception to the full and complete compliance with the provisions and requirements of Annual Wage Order No. _____ Section _____ issued by the Missouri Division of Labor Standards and applicable to this project located in _____ County, Missouri, and completed on the ____ day of _____, _____.

The matters stated herein are true to the best of my information, knowledge, and belief. I acknowledge that the falsification of any information set out above may subject me to criminal prosecution pursuant to §§290.340, 570.090, 575.040, 575.050, or 575.060, RSMo.

_____
Signature

Subscribed and sworn to me this ____ day of _____, _____.

My commission expires _____, _____.

_____
Notary Public

_____
Receipt by Authorized Public Representative

Missouri Department of Labor and Industrial Relations is an equal opportunity employer/program.

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AIA® Document A305™ – 2020

Contractor's Qualification Statement

THE PARTIES SHOULD EXECUTE A SEPARATE CONFIDENTIALITY AGREEMENT IF THEY INTEND FOR ANY OF THE INFORMATION IN THIS A305-2020 TO BE HELD CONFIDENTIAL.

SUBMITTED BY:
(Organization name and address.)

SUBMITTED TO:
(Organization name and address.)

TYPE OF WORK TYPICALLY PERFORMED
(Indicate the type of work your organization typically performs, such as general contracting, construction manager as constructor services, HVAC contracting, electrical contracting, plumbing contracting, or other.)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

THIS CONTRACTOR'S QUALIFICATION STATEMENT INCLUDES THE FOLLOWING:
(Check all that apply.)

[ ] Exhibit A – General Information
[ ] Exhibit B – Financial and Performance Information
[ ] Exhibit C – Project-Specific Information
[ ] Exhibit D – Past Project Experience
[ ] Exhibit E – Past Project Experience (Continued)

CONTRACTOR CERTIFICATION
The undersigned certifies under oath that the information provided in this Contractor's Qualification Statement is true and sufficiently complete so as not to be misleading.

Organization's Authorized Representative Signature

Date

Printed Name and Title

NOTARY
State of:
County of:
Signed and sworn to before me this day of

Notary Signature

My commission expires:

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User Notes: (3B9ADA35)

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COLUMBIA PUBLIC SCHOOLS
CONSTRUCTION AGREEMENT
FOR PROJECT # ____

This Agreement is entered into this __ day of _____, 20__, by and between the Columbia School District No. 93 (hereinafter referred to as "District"), and _____ (hereinafter referred to as "Contractor").

WHEREAS, on _____, the District issued an Invitation to Bid on a project involving _____[A1], referred to as Project #____;

WHEREAS, on _____, Contractor submitted a bid in response to the District's Invitation to Bid;

WHEREAS, the District has determined that Contractor was the lowest responsible bidder that responded to the District's Invitation to Bid;

WHEREAS, the District and Contractor desire that Contractor provide labor, materials and equipment for the project as set forth herein, and the parties further desire to set forth the terms and conditions of their Agreement in writing.

NOW, THEREFORE, in consideration of these agreements and certain covenants contained herein and other valuable consideration, the sufficiency of which is hereby acknowledged, the District and Contractor agree as follows:

1.0 Scope of Work.

Contractor shall complete the project and provide all labor, materials, and equipment necessary for completion of the project. The scope of work for the project shall consist of _____[A2], and includes all work necessary and identified in the District's Invitation to Bid and all other Attachments incorporated into this Agreement below. The scope of work shall be performed in accordance with this Agreement. The project shall be referred to throughout the remainder of this Agreement as the "Work". All Work under this Agreement shall be done by Contractor in compliance with all applicable local, county, state, and federal laws, codes, ordinances, and regulations, and shall also comply with _____[A3]. The Contractor shall be solely responsible for obtaining all necessary building permits, licenses and other documents to perform the Work. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time this Agreement is executed. In the event of any inconsistency or conflict between provisions of this Agreement and the provisions of any documents referenced and attached hereto, then at the option of the District, the stricter shall prevail and control.

2.0 Completion of Work.

Work shall commence no later than _____. All time limits are of the essence of the Agreement. Contractor shall diligently continue Work under this Agreement to

achieve final completion of the entire Work not later than _____. In the event that Work is not completed by this time, the parties agree that this will cause serious and substantial damages to the District, and it will be difficult, if not impossible to prove the amount of such damages. Contractor therefore agrees to pay to the District as liquidated damages for such delay the sum of _____ dollars and zero cents ($___.00) per day until the Work is complete, subject to an event of Force Majeure as set forth below. This sum is agreed upon as liquidated damages and not as a penalty. The parties hereto have computed, estimated and agreed upon the sum as an attempt to make a reasonable forecast of probable actual loss because of the difficulty of estimating with exactness the damages that will result.

3.0 Payment.

The District shall pay the Contractor a lump sum amount (hereinafter referred to as "Payment") not to exceed _____ dollars and _____ cents ($_____) to complete the Work.

Contractor shall invoice the District for payment as the Work progresses. Invoices for payment shall be submitted by Contractor to the District for processing. With each invoice for payment, Contractor will submit the following:

- All applicable lien waivers in the same or substantially the same form as that attached to this Agreement;
- Contractor's Affidavit of Release of Liens;
- A Work Completion Report;
- A complete list of all employees and subcontractors' employees performing the Work during that period of time;
- Complete copies of its records for that period of time reflecting payment of material suppliers, subcontractors and employees; and,
- An Affidavit of Compliance with the Prevailing Wage Law[A4].

All pay applications must list the schedule of values for the Work done to that point, which shall include but not be limited to materials and labor. When applicable, the schedule of values must be separated by each District facility on which the Work is being performed.

Provided any invoice and all other required documents are received by the District not later than the 24th day of the month and if the Work is completed in accordance with all of the terms of this Agreement and the Attachments, the District shall make payment to Contractor not later than the tenth day of the following month. If the invoice and all other required documents are received in original signed form by the District after the date affixed above, payment shall be made by the District not later than the tenth day of the second month following that in which the documents are received.

All original pay applications and invoices shall be mailed or delivered to the District, courtesy of the COO Office, 1818 West Worley, Columbia, MO 65203.

4.0 Retainage.

Prior to final payment, any payments owed to Contractor by the District for portions of the Work completed will be reduced by five percent (5%) [A5]as retainage. Payments and retainage shall be calculated as follows: that portion of the total Payment amount under this Agreement that is properly allocable to complete Work, as determined by multiplying the percentage completion of each portion of the Work by the share of the total Payment amount under this Agreement allocated to that portion of the Work, less retainage of five percent (5%)[A6].

5.0 Final Payment.

Pending final determination of cost to the District of changes in the Work, amounts not in dispute shall be included as provided in this Agreement. Final acceptance of the total scope of Work shall be approved by the District. Contractor shall complete the District's Contract Closeout Procedure, which is included in the list of attachments to this Agreement, prior to submitting an invoice for final payment.

Contractor shall submit an invoice for final payment upon final acceptance of the Work by the District. Such invoice shall include all the requirements for other invoices as required by this Agreement, as well as Final Lien Waivers, all forms included in or required by any attachment to this Agreement, and all other documentation required under this Agreement. **All provisions and requirements in this Agreement and the attachments thereto must be completed, met, and/or fulfilled prior to final payment.**

6.0 Insurance.

Contractor shall acquire and maintain for the duration of this Agreement, the insurance described below in a form acceptable to the District. A certificate of insurance which names the District as an additional insured per the requirements described below is to be furnished at the time of execution of this Agreement and prior to the Work proceeding under this Agreement. Purchase of any insurance required by this Agreement shall not constitute a waiver of the District's sovereign or governmental immunity. Umbrella Coverage sufficient to meet collective requirements is acceptable.

A. Worker's Compensation Insurance:

Contractor shall take out and maintain during the life of this Agreement, employer's liability and worker's compensation insurance for all of Contractor's employees employed at the site of the Work, and in case any Work is sublet, Contractor shall require the subcontractor similarly to provide worker's compensation insurance for all of the latter's employees unless such employees are covered by the protection afforded by Contractor. In case any class of employees engage in hazardous work under this Agreement at the site of the Work and are not protected under Missouri's worker's compensation statutes, Contractor shall provide and shall cause each subcontractor to provide employer's liability insurance for the protection of their employees not otherwise protected. The Contractor is to maintain and provide the District a copy of proof of

Worker's Compensation Insurance. Employer's liability limits shall at all times be not less than those amounts required by Missouri's worker's compensation statutes.

B. Public Liability and Property Damage Insurance:

The Contractor shall take out and maintain during the life of this Agreement, such public liability and property damage insurance as shall protect them and any subcontractor performing Work covered by this Agreement from claims for damages for personal injury, including accidental death, as well as from claims for property damages, which may arise from operations under this Agreement, whether such operations be by themselves or by any subcontractor or by anyone directly or indirectly employed by either of them. The amounts of such insurance shall have policy limits that are no less than the maximum legal liability limits set forth in § 537.610, RSMo., and shall include the following types of policies:

- Public Liability Insurance covering both bodily injury and property damage, including accidental death.
- Automobile Public Liability and Property Damage covering both bodily injury, including accidental death, and property damage, and applying to any and all claims arising from the use of the Contractor's own automobiles, teams and trucks; hired automobiles, teams and trucks; and automobiles both on and off the site of the Work.

C. Proof of Insurance:

Contractor shall furnish the District with a certificate of insurance which names the District as an additional insured in amounts as required by this Agreement and requiring a thirty (30) day mandatory cancellation notice. In addition, such insurance shall remain in effect until such time as the District has determined that the Agreement is complete.

7.0 No Waiver of Immunity.

The District preserves all immunities recognized at law. Nothing herein shall be construed as a waiver of Sovereign Immunity or Governmental Immunity by whatever name as set forth in common law, statutes, ordinances, regulations, the Missouri Constitution, and/or the United States Constitution, including but not limited to § 537.600 RSMo, et seq.

8.0 Contractor's Warranty

Contractor warrants that the Work done pursuant to this Agreement, including all materials and workmanship, will be performed in a good and workmanlike manner and that such Work will be warranted to be free from defects for a period of one (1) year from the date of completion of the Work. Any manufacturer's warranties for products included in the Work which exceed this one (1) year period shall be assigned to the District to the extent allowed by the manufacturer. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by the District, remove it from the project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects,

attorneys, and other professionals and all court or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others). When correcting defective Work, Contractor shall take no action that would void or otherwise impair the District's special warranty and guarantee, if any, on said Work.

9.0 Warranty Documentation.

Contractor shall provide duplicate, notarized copies of all warranty documentation. Contractor shall also execute Contractor's submittals and assemble warranty documents executed by subcontractors, suppliers, and manufacturers, and assemble the same in a binder with a durable plastic cover and a table of contents. This binder shall be delivered by Contractor to the District prior to Contractor submitting an invoice for final payment. For warranty documentation related to equipment put into use with the District's permission during construction, Contractor shall submit the required warranty documentation to the District within 10 days of the equipment first operating. For warranty documentation related to items of the Work delayed materially beyond the completion date stated in this Agreement, Contractor shall submit the required warranty documentation to the District within ten (10) days after acceptance of the Work by the District, and will list the date of acceptance of the Work as the start of the warranty period.

10.0 Payment/Performance Bonds[A7].

Contractor will provide to the District within one (1) week of the full execution of this Agreement a separate performance bond and statutory/public works payment bond, each in the sum of one hundred percent (100%) of the cost of the Work contemplated by this Agreement and the Attachments.

11.0 Force Majeure.

In the event either party is unable to carry out any of its obligations under this Agreement due to causes beyond its control, including, but not limited to, acts of God, governmental or judicial authority, insurrection, riots, material shortages, fires, explosions, floods, acts of terrorism, or other Force Majeure, this Agreement shall remain in effect but Contractor's obligation shall be suspended for a period equal to the disabling circumstances. However, in the event that Contractor is claiming an event of Force Majeure, Contractor must give the District prompt written notice describing the particulars of the Force Majeure, including but not limited to the nature of the occurrence and its expected duration, and must continue to furnish timely regular reports with respect thereto during the period of Force Majeure. Contractor agrees to use reasonable efforts to remedy its inability to perform during any period of Force Majeure. Contractor shall not be entitled to an adjustment in the amount paid under this Agreement or the time for performing the Work for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or supplier shall be deemed to be delays within the control of Contractor.

12.0 Representations of the Parties.

A. Each party to this Agreement represents to the other that:

i. It has all requisite power, authority, licenses, permits, and franchises, corporate or otherwise, to execute and deliver this Agreement and performs its obligations hereunder;
ii. Its execution, delivery, and performance of this Agreement have been duly authorized, executed, and delivered for it by the signatory so authorized, and constitutes its legal, valid, and binding obligation;
iii. The persons executing this Agreement are fully authorized to do so; and
iv. It has not received any notice, nor to the best of its knowledge there is pending or threatened any notice of any violation of any applicable laws, ordinances, regulations, rules, decrees, awards, permits, or orders which would materially adversely affect its ability to perform hereunder.

B. Contractor's Representations:
i. Contractor has examined and carefully studied the Attachments and any other related data identified in the Attachments;
ii. 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, and performance of the Work;
iii. Contractor is familiar with and is satisfied as to all federal, state, and local laws and regulations that may affect cost, progress, and performance of the Work;
iv. Contractor does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Agreement price, within the Agreement times, and in accordance with the other terms and conditions of the Agreement and Attachments;
v. Contractor is aware of the general nature of the work to be performed by the District and others at the site that relates to the Work as indicated in the Agreement and the Attachments;
vi. Contractor has correlated the information known to Contractor, information and observations obtained from visits to the site, reports and drawings identified in the Attachments, and all additional examinations, investigations, explorations, tests, studies, and data with the Attachments and this Agreement;
vii. The Agreement and the Attachments are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work;
viii. Contractor is responsible for verifying viability of any Plans or Specifications, and the District does not warrant that any such Plans or Specifications will be free from defect or error; and,
ix. Contractor warrants and guarantees to the District that all Work will be in accordance with the Agreement and the Attachments and will not be defective. Contractor's obligation to perform and complete the Work in accordance with the Agreement and the Attachments shall be absolute.

13.0 <u>Relationship of the Parties</u>.

Nothing in this Agreement shall be construed as reserving to the District any right to exercise any control over or to direct in any respect the conduct or management of business or operations of Contractor. The entire control or direction of such business and operation shall be

in and shall remain in Contractor, subject only to Contractor's performance of its obligations under this Agreement. Neither Contractor nor any person performing any duties engaged in any Work on behalf of Contractor shall be deemed an employee or agent of the District.

14.0 Subcontractors.

Contractor shall provide the District with a list of all subcontractors Contractor intends to use on the project. The District shall have the right from time to time to require Contractor to furnish evidence that these subcontractors are being paid in a timely fashion for their Work.

15.0 Construction of Agreement.

This Agreement and the construction and enforceability thereof shall be under the laws of the state of Missouri. The venue for any action or proceeding between the parties in connection with this Agreement shall be in the County of Boone, State of Missouri.

16.0 Prevailing Wage.

The following provision shall only apply in the event that the Work is subject to Missouri's Prevailing Wage Law:[A8]

Contractor at all times agrees to comply with the provisions and requirements set out in Chapter 290, Sections 290.210 through and including 290.340, Revised Statutes of Missouri, pertaining to the payment of wages to workers employed on public work projects. Not less than the prevailing hourly rate of wages or the public works contracting minimum wage identified in the Wage Order attached hereto as an Attachment shall be paid by Contractor to each worker completing the Work under this Agreement. Contractor further agrees to comply with all requests for information regarding compliance with the Prevailing Wage Law, including but not limited to, the execution of an affidavit prepared by the Missouri Department of Labor and Industrial Relations, Division of Labor Standards pertaining to compliance with the Prevailing Wage Law.

While the Work is being performed, the Contractor and all subcontractors shall submit to the District with any invoice/pay application, certified copies of Contractor's and any subcontractor's payrolls using the LS-57 form attached to this Agreement. Prior to payment of the retainage, the Contractor shall submit an affidavit to the District stating that it has fully complied with the Prevailing Wage Law.

The Contractor shall forfeit as a penalty to the District, on whose behalf this Agreement is made or awarded, One Hundred dollars ($100.00) for each worker employed, for each calendar day, or portion thereof such worker is paid less than the said stipulated rates, for any Work done under the Agreement, by the contractor or by any subcontractor under them.

In all Contractors' bonds the Contractor shall include such provisions as will guarantee the faithful performance of this prevailing hourly wage clause.

The District and Contractor may withhold assessed penalties from Contractors and any of its subcontractors, respectively, and for any fines imposed upon the District for non-compliance to procedures outlined in the respective laws.

17.0 OSHA Training.

Contractors and subcontractors who perform the Work shall provide, at a minimum, a ten (10) hour Occupational Safety and Health instruction and safety program, or similar program approved by the Department of Labor, for their employees relative to Work being performed. All employees performing the Work must have completed the course within 10 days of beginning Work and shall keep evidence of completion on the worksite.

Contractors and subcontractors in violation will forfeit a lump sum of $2,500.00 to the District, plus $100.00 for each worker employed without training for each day the worker is employed without training.

18.0 Transient Employers.

Every transient employer, as defined in § 285.230, RSMo, must post in a prominent and easily accessible place at the Work site a clearly legible copy of the following: (1) The notice of registration for employer withholding issued to such transient employer by the Director of Revenue; (2) Proof of coverage for workers' compensation insurance or self-insurance signed by the transient employer and verified by the Department of Revenue through the records of the Division of Workers' Compensation; and (3) The notice of registration for unemployment insurance issued to such transient employer by the Division of Employment Security. Any transient employer failing to comply with these requirements shall, under § 285.234, RSMo, be liable for a penalty of $500.00 per day until the notices required by this section are posted as required by that statute.

19.0 Asbestos Notification.

Contractor acknowledges that by entering into this Agreement that it has received notification per CFR 40-763, including Sub Part B (OHSA 1926.1101), that the District's campuses do contain asbestos containing materials. Contractor shall execute and return to the District upon entering into this Agreement the Asbestos notification form attached to this Agreement.

20.0 Hold Harmless.

To the fullest extent permitted by law, Contractor shall indemnify and hold harmless the District, its Board of Education, Officers, Directors, Partners, Agents, Consultants, Employees and Sub-Contractors of each and any of them from and against all claims, costs, damages, losses and expenses (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals in all courts or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, damage or expense is attributable to any act or failure to act, negligent or otherwise, of Contractor, of any

subcontractor (meaning anyone, including but not limited to consultants having a contract with Contractor or a subcontractor for a part of the Work), or of anyone directly or indirectly employed by Contractor or by any subcontractor, or of anyone for whose acts the Contractor or its subcontractor may be liable, in connection with performing the Work.

21.0 Background Checks.

Contractor shall have on file with the District two types of background checks for all employees or subcontractors' employees who will be working unescorted on/in any District campus and/or buildings. The two checks are:

- Missouri Child Abuse or Neglect/Criminal Record Check
- Missouri State Highway Patrol Criminal Record Check

Contractor shall provide these background checks to the District. All background checks are required to be on file and approved by the District, in the District's sole and absolute discretion, prior to authorization to proceed. The District will notify the Contractor of approved and unapproved background checks. It shall be the responsibility of the Contractor to ensure all of its employees and its subcontractors' employees are in compliance with District access security requirements.

Contractor shall not utilize an employee, including a subcontractor or his employee, on District property who is a registered sex offender.

Contractor, its employees, agents, subcontractors, and representatives shall comply with all Districtwide Policies and Procedures, including the District's tobacco-free campus Policy.

22.0 Change Orders.

Changes in the Work may be accomplished after execution of this Agreement, and without invalidating the Agreement, by a written Change Order. A Change Order is a written instrument prepared by the Contractor or the District (including any design professionals engaged by the District), and signed by the Contractor and the District stating their agreement upon the change in the Work, the amount of the adjustment in payment, if any, and the extent of the adjustment in the completion time for the Work, if any. Any markups in Change Orders shall be made in accordance with the Attachments, but Contractor shall limit the markup, including but not limited to overhead and profit, on all Change Orders so that the same shall not exceed 10% total, which shall include the markup of both the Contractor and any subcontractors combined.

Contractor may submit a Request for Information to the District requesting clarification of any portion of the Agreement, including Change Orders. The District shall respond to all Requests for Information promptly.

23.0 Attachments.

The following documents shall comprise the Attachments, and are incorporated into this Agreement as if fully stated herein:

A. _____[A9] Specifications.
B. Prevailing Wage Order No. _____, dated _____.[A10]
C. Contractor's Performance Bond
D. Contractor's Payment Bond
E. Any written Change Orders issued after execution of this Agreement.
F. Contractor's Bid
G. The District's "Invitation to Bid", including any addenda.
H. Notarized Lien Waiver Form
I. Asbestos Notification Acknowledgement Form
J. LS-57 Payroll Form
K. District's Contract Closeout Procedure

In the event of any inconsistency or conflict between provisions of this Agreement and the provisions of any Attachment, then at the option of the District, the stricter shall prevail and control.

The Attachments may only be amended, modified, or supplemented with the written agreement of the District and Contractor.

24.0 Termination.

A. At any time and without cause, the District may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the total Payment amount or an extension of the time to complete the Work, or both, directly attributable to any such suspension.
B. The occurrence of any one or more of the following events will justify termination for cause:
    i. Contractor's failure to perform the Work in accordance with this Agreement and the Attachments (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment);
    ii. Contractor's disregard of applicable laws, regulations, ordinances, or District Policies and Procedures; or
    iii. Contractor's violation in any substantial way of any provisions of this Agreement or the Attachments.
C. If one or more of the events identified in the preceding paragraph occur, the District may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
    i. Exclude Contractor from the Work site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion),
    ii. Incorporate in the Work all materials and equipment stored at the site or for which the District has paid Contractor but which are stored elsewhere, and
    iii. Complete the Work as the District may deem expedient.

D. If the District proceeds as provided in the preceding paragraph, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of this Agreement exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by the District arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to the District. When exercising any rights or remedies under this paragraph the District shall not be required to obtain the lowest price for the Work performed.

E. Notwithstanding the foregoing, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

F. Where Contractor's services have been so terminated by the District, the termination will not affect any rights or remedies of the District against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by the District will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under this Agreement, the termination procedures of that bond shall supersede the preceding termination provisions.

H. Upon seven days written notice to Contractor, the District may, without cause and without prejudice to any other right or remedy of the District, terminate this Agreement. In such case, Contractor shall be paid for (without duplication of any items):
   i. Completed and acceptable Work executed in accordance with this Agreement and the Attachments prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
   ii. Expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by this Agreement and the Attachments in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
   iii. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

I. The District and Contractor shall make a good faith effort to resolve all disputes with an informal meeting between representatives of both parties with decision-making authority before resorting to other means of resolution. By written agreement, the parties may decide to enter into formal mediation or arbitration proceedings to resolve a dispute, although neither is required. Nothing in this paragraph shall limit either party's ability to file a lawsuit in a court of law regarding a dispute.

25.0 <u>Miscellaneous Provisions</u>.

A. Prior to commencement of the Work, Contractor shall provide to the District a sworn affidavit and other sufficient documentation to affirm its enrollment and participation in a federal work authorization program with respect to the employees working in connection with this Agreement. Contractor shall also provide the District a sworn

affidavit affirming that it does not knowingly employ any person who is an unauthorized alien in connection with the Work.

B. Contractor will be required to comply with the President's Executive Order No. 11246, Title VI and Section 3 of the 1968 HUD Act as pertaining to Equal Employment Opportunity through Affirmative Action. Contractor must comply with all applicable requirements of federal and state civil rights law and rehabilitation statutes and shall not discriminate based on race, religion, color, sex, national origin, age, or disability.

C. The District is a public entity exempt from payment of state sales taxes and will furnish Contractor with all required information to allow Contractor to benefit from this status. Contractor shall apply the exemption in accordance with state law for purchases required for the Work. Contractor shall pay all other required sales, consumer, use, and other similar taxes, if any.

D. Whenever any provision of this Agreement or the Attachments requires the giving of written notice, it will be deemed to have been validly given if delivered in person or sent by registered or certified mail, postage prepaid, to:

i. Columbia Public Schools
c/o Chief Operating Officer
1818 West Worley
Columbia, MO 65203

ii. _____
_____
_____
_____

E. When any period of time is referred to in this Agreement or the Attachments by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

F. The duties and obligations imposed by this Agreement and the Attachments and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of this Agreement and the Attachments. The provisions of this Paragraph will be as effective as if repeated specifically in this Agreement and the Attachments in connection with each particular duty, obligation, right, and remedy to which they apply.

G. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with this Agreement and the Attachments, as well as all continuing obligations indicated in this Agreement and the Attachments, will survive final payment, completion, and acceptance of the Work or termination or completion of this Agreement or termination of the services of Contractor.

H. Article and paragraph headings are inserted for convenience only and do not constitute parts of this Agreement.

I. This Agreement may be executed in one or more counterparts, each of which shall constitute an original and which, when taken together, shall constitute one entire Agreement. It shall be fully executed when each party whose signature is required has signed at least one counterpart even though no one counterpart contains the signatures of all the parties to this Agreement.

J. Neither party may assign their rights and obligations under this Agreement without the prior written consent of the other party, which consent shall not be unreasonably withheld.

K. This Agreement and Attachments constitutes the entire agreement between the parties hereto and there are no other understandings, written or oral, relating to the subject matter hereof, and may not be changed, modified, or amended, in whole or in part, except in writing signed by the District and Contractor.

REMAINDER INTENTIONALLY LEFT BLANK

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day and year first above written.

CONTRACTOR

By: _____

Name (Printed): _____

Title: _____

Date: _____

COLUMBIA PUBLIC SCHOOLS

By:

_____ Date:_____
Board of Education President

Attested by:

_____ Date:_____
Board of Education Secretary

AIA® Document A312™ – 2010

Performance Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)
Columbia Public Schools
1818 West Worley
Columbia, Missouri 65203

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONSTRUCTION CONTRACT
Date:
Amount: $
Description:
(Name and location)
CPS Roseta Avenue Learning Center Accessibility, Safety and Security Improvements
Columbia, Missouri

BOND
Date:
(Not earlier than Construction Contract Date)

Amount: $
Modifications to this Bond: None See Section 16

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)
Charles A. Oestreich
Building Services
5909 Paris Road
Columbia, Missouri 65202
Telephone Number: (573) 214-3760
Fax Number: (573) 214-3761
Mobile Number:(573) 239-6337
Email Address:coestreich@cpsk12.org

Init.
/

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User Notes: (3B9ADA39)

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

.1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

.2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

.3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

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§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and

.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

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§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address:		Address:	

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Payment Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)
Columbia Public Schools
1818 West Worley
Columbia, Missouri 65203

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONSTRUCTION CONTRACT
Date:
Amount: $
Description:
(Name and location)
CPS Roseta Avenue Learning Center Accessibility, Safety and Security Improvements
Columbia, Missouri

BOND
Date:
(Not earlier than Construction Contract Date)

Amount: $
Modifications to this Bond: None See Section 18

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	

(Any additional signatures appear on the last page of this Payment Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)
Charles A. Oestreich
Building Services
5909 Paris Road
Columbia, Missouri 65202
Telephone Number: (573) 214-3760
Fax Number: (573) 214-3761
Mobile Number: (573) 239-6337
Email Address:
coestreich@cpsk12.org

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§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

.2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

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§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

- **.1** the name of the Claimant;
- **.2** the name of the person for whom the labor was done, or materials or equipment furnished;
- **.3** a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
- **.4** a brief description of the labor, materials or equipment furnished;
- **.5** the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- **.6** the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
- **.7** the total amount of previous payments received by the Claimant; and
- **.8** the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

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§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address:		Address:	

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AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

CPS Roseta Avenue Learning Center Accessibility, Safety and Security Improvements
Columbia, Missouri

THE OWNER:
(Name, legal status and address)

Columbia Public Schools
1818 West Worley
Columbia, Missouri 65203

THE ARCHITECT:
(Name, legal status and address)

Peckham & Wright Architects, Inc.
d/b/a "PWArchitects, Inc." "PWA"
2120 Forum Boulevard, Suite 101
Columbia, Missouri 65203

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

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15 CLAIMS AND DISPUTES

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

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.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

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§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set

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forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

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§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the 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 notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

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§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

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§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect 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 may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

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

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 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.

§ 3.7.3 If the Contractor performs Work knowing it to be 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.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately

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suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- **.1** allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- **.2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- **.3** whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

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§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

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§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

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§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 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 Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not

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have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

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§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. 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 the subcontractors of a Separate Contractor.

§ 5.1.2 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 at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

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 that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect 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

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similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the

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Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
.2 Unit prices stated in the Contract Documents or subsequently agreed upon;

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.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;

.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and

.5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor

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change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, 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 Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

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§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, 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 suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 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, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot

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be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

.1 defective Work not remedied;
.2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
.3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a Separate Contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
.7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

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§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 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.

§ 9.8.2 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 Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that 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. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented

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to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other 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, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 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;

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.3 terms of special warranties required by the Contract Documents; or
.4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a 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.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

.1 employees on the Work and other persons who may be affected thereby;
.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

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§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The

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Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds

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of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

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§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before 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 Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of 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. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the

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other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. 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 Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

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ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- **.1** Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- **.2** An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- **.3** Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- **.4** The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- **.1** repeatedly 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** repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- **.4** otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, 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, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- **.1** Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- **.2** Accept assignment of subcontracts pursuant to Section 5.4; 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 detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance,

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the Contractor 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.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

.1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 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.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

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§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the

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Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

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§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

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SECTION 00 72 01
SUPPLEMENT TO GENERAL CONDITIONS
OF THE CONTRACT FOR CONSTRUCTION

THE SUPPLEMENT TO GENERAL CONDITIONS

The following supplements modify, change, delete from or add to the "General Conditions of the Contract for Construction," AIA Document A201, Seventeenth Edition, 2017. Where any Article of the General Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

In addition to the modifications, changes and deletions enumerated below, the "Columbia Public Schools Construction Agreement" shall further modify, change, delete and/or supplement the Contract Documents, including the "Standard Form of Agreement Between Owner and Contractor", AIA Document A101-2017, and the "General Conditions of the Contract for Construction", AIA Document A201-2017. To the extent that any document included in the Contract Documents conflicts with any portion of the "Columbia Public Schools Construction Agreement," the applicable conflicting provision or language of the "Columbia Public Schools Construction Agreement" shall control.

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AMENDMENTS

ARTICLE 1 - GENERAL PROVISIONS

1.1.1 THE CONTRACT DOCUMENTS

Subparagraph 1.1.1 -- Deleted in its entirety and substitute with the following:

1.1.1 The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior

to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order approved by the Owner pursuant to this Agreement, (3) a Construction Change Directive approved by the Owner pursuant to this Agreement or (4) a written order for a minor change in the Work issued by the Architect.

1.5 "Ownership and use of Architect's Drawings, Specifications and other Documents"

The following subparagraph added:

1.5.3 Number of copies furnished: The successful Contractor will be supplied with a maximum of ten (12) sets of construction documents for construction purposes, at no charge. Additional sets will be furnished at Contractor's request, for the cost of reproduction.

ARTICLE 2 - OWNER

The following Subparagraph added:

2.1.3 "The Owner" refers to Columbia Public Schools, 1818 W. Worley, Columbia, MO 65203.

2.2 EVIDENCE OF OWNER'S FINANCIAL ARRANGEMENTS

Delete Section 2.2 and all of its subsections.

2.3 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.3.3 Delete the following:

to whom the Contractor has no reasonable objection and

2.3.4 – Delete in its entirety and substitute:

2.3.4 As reasonably required and necessary, the Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work. Contractor shall be required, in the event of digging or disruption of soil, to verify utility locations independently through Missouri OneCall.

2.5 OWNER'S RIGHT TO CARRY OUT THE WORK

Delete in its entirety and substitute:

2.5 If the Contractor defaults or fails 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 commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses, assessment of liquidated damages, and compensation for the Owner's or Architect's additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the

Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 - CONTRACTOR

The following subparagraph added:

3.2.5 The Contractor makes the following representations: Contractor has examined and carefully studied the Contract Documents and any other related data identified in the Contract Documents; Contractor is familiar with and is satisfied as to all federal, state, and local laws and regulations that may affect cost, progress, and performance of the Work; Contractor does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the agreed upon price, within the Contract Documents times, and in accordance with the other terms and conditions of the Contract Documents; Contractor is aware of the general nature of the work to be performed by Owner and others at the site that relates to the Work as indicated in the Contract Documents; 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; the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work; Owner does not warrant that the Contract documents or Plans will be free from defect or error and Contractor is responsible for verifying viability of any Plans; and Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute.

3.5 WARRANTY

Paragraph 3.5 – Delete in its entirety and substitute:

3.5 The Contractor warrants to the Owner and Architect 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 be performed in a workmanlike manner and 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 may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. Contractor further warrants that the materials and labor provided pursuant to this Agreement will be warranted to be free from defects and materials and workmanship for a period of one (1) year from the date of completion of the work. Any manufacturer's warranties for products which exceed this one (1) year period shall be assigned to Owner to the extent allowed by the manufacturer. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Owner, remove it from the project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or other dispute resolution costs) arising out of or

relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others). When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work. Contractor shall provide duplicate, notarized copies of all warranty documentation. Contractor shall also execute Contractor's submittals and assemble warranty documents executed by subcontractors, suppliers and manufacturers, and assemble the same in a binder with a durable plastic cover and a table of contents. This binder shall be delivered by Contractor to Owner prior to Contractor submitting an invoice for final payment. For warranty documentation related to equipment put into use with Owner's permission during construction, Contractor shall submit the required warranty documentation to Owner within 10 days of the equipment first operating. For warranty documentation related to items of the Work delayed materially beyond the completion date stated in this Agreement, Contractor shall submit the required warranty documentation to Owner within ten (10) days after acceptance of the Work by Owner, and will list the date of acceptance of the Work as the start of the warranty period.

Add the following subparagraphs to Paragraph 3.5:

3.5.3 Each Subcontractor, Sub-Subcontractor, or Supplier shall guarantee to the General Contractor all work, portions of work, and items supplied, as the case may be, against defects resulting from the use of any inferior materials, equipment or workmanship for one (1) year from the date of final completion or beneficial occupancy of the project by the Owner, whichever is earlier. It shall be the General Contractor's responsibility to ensure compliance to the warranty by each Subcontractor, Sub-Subcontractor, or Supplier.

3.5.4 In any case where, in fulfilling the requirements of this Contract or Warranty, the Contractor, Subcontractor, Sub-Subcontractor, or Supplier disturbs any other work in place or under contract, he shall be responsible to perform, arrange, and pay for restoring such to original condition.

3.6 TAXES

3.6 – Delete in its entirety and substitute:

3.6 All taxes, other than sales taxes, incurred in connection with the Work and Project or portions thereof provided by Contractors, regardless of when enacted, shall be paid by the Contractor.

The following subparagraphs added:

3.6.1 MISSOURI TAX EXEMPTION: In accordance with the State of Missouri's Department of Revenue provisions, a Contractor performing work for an exempt entity is allowed to purchase construction materials exempt from sales tax.

3.6.1.1 In order to claim Exemption, the Contractors and Subcontractors are required to present their supplier(s) with copies of the "Project Exemption Certificate" and the Owner's "Exemption from Missouri Sales and Use Tax" letter.

3.6.1.2 This Project Exemption Certificate does not allow contractors to purchase machinery, equipment, or tools tax exempt.

3.6.1.3 Suppliers accepting this Project Exemption certificate are required to render to the Contractor invoices bearing the name of the exempt entity and the project identification number.

3.6.1.4 Prior to Construction, Owner will furnish the Contractor with the Project Exemption Certificate and their Exemption from Missouri Sales and Use Tax letter for his/her use and for distribution to all applicable subcontractors.

3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

3.7.3 -- The following is added to the end of the last sentence:

and bear any legal or equitable liability for said actions.

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Subparagraph 3.12.7 -- Revised to read as follows:

3.12.7 The Contractor shall perform no portion of the work requiring submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been reviewed by the Architect. Such work shall be in accordance with submittals.

Subparagraph 3.12.8 -- Revised to read as follows:

3.12.8 The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's review of Shop Drawings, Products Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and the Architect has given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's review thereof.

Subparagraph 3.12.10.1 – Delete the following:

The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents.

ARTICLE 4 - ARCHITECT

4.2 ADMINISTRATION OF THE CONTRACT

Subparagraph 4.2.2 -- First line revised to read as follows:

4.2.2 The Architect will, as provided in the Owner-Architect Agreement, visit the site at intervals appropriate to.....

Subparagraph 4.2.7 -- First line revised to read as follows:

4.2.7 The Architect will review or take other appropriate action upon, …

Subparagraph 4.2.7 -- Last sentence revised to read as follows:

4.2.7 The Architect's review of a specific item shall not indicate approval of an assembly of which the item is a component.

ARTICLE 5 – SUBCONTRACTORS

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

5.4.2 – Delete in its entirety and substitute:

5.4.2 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 – CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

6.2 MUTUAL RESPONSIBILITY

A. Amend the first sentence of subparagraph 6.6.3 to read "…payable to a separate contractor because of ~~Contractor~~ delays, improperly timed activities or defective construction of Contractor or any person or entity for whom Contractor is responsible, including its Subcontractors and suppliers."

B. Amend subparagraph 6.6.4 to read "…damage the Contractor or any person or entity for whom Contractor is responsible, including its Subcontractors and suppliers wrongfully causes to ..."

ARTICLE 7 – CHANGES IN THE WORK

7.1 GENERAL

7.1.2 -- Add the following to the end of the last sentence:

so long as it does not increase the Contract Sum.

The following subparagraph is added:

7.1.4 Notwithstanding anything in this Article 7 and elsewhere in the Contract Documents, for any Change Order or Construction Change Directive which changes the Contract Sum, the following conditions apply:

.1 If the change is requested by the Architect for work falling under a fixed price contract, the amount will be based on the Contactor's price quotation.

.2 For changes requested by the Contractor, the amount will be based on the Contractor's request for a Change Order or Change Directive as approved by the Architect and Owner.

.3 For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices.

.4 For a change ordered by the Architect without a quotation for the Contractor, the amount will be determined by the Architect based on the Contractor's substantiation of costs as specified for Time and Material work.

.5 Except as indicated in the Project Manual, the allowance for any overhead and profit, combined, derived by Contractor or any subcontractors as a result of any change, including the total cost to the Owner, shall be no more than 5% total, which shall include the cost of labor and materials by both Contractor, Contractor's subcontractors and sub-subcontractors.

.6 Except as indicated in the Project Manual, the allowance for overhead and profit shall account for ALL time associated with the Change Order or Change Directive. Compensation for time generating documents will not be allowed.

.7 In order to facilitate checking of quotations for extras and credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs, including labor, materials and subcontracts. Labor and materials shall be itemized. Where major cost items are subcontracts, they shall also be itemized.

.8 The allowance for Payment and Performance Bond costs associated with any Change Order or Change Directive shall not exceed 1.5% and shall be used on both additive and deductive Change Orders or Change Directives.

ARTICLE 8 – TIME

8.1 TIME

Paragraphs 8.1.5 and 8.1.6 shall be added as follows:

8.1.5 The Contract Time for completion of the Contract for the Project, under the Base Bid, as listed on the Project Timeline and mutually agreed between Owner and Contractor from the written Notice to Proceed issued by the Architect to Substantial completion of the work as defined in Subparagraph 9.8.1, including authorized adjustments thereto.

In the event the Contractor has not completed the work within the time allotted, the contractor agrees to pay the Owner, or deduct from its contract sum, not as a penalty but as liquidated damages, the sum of ___Two-Hundred and Fifty_____ Dollars and Zero Cents **($250.00) for each and every calendar day that the work remains incomplete** after the time stipulated for Substantial Completion.

8.1.6 The Contractor shall be responsible to reimburse the Owner for the cost of a Project Representative after the time of completion has expired and until the date of Substantial Completion as certified by the Architect.

8.3 DELAYS AND EXTENSION OF TIME

A. Amend Subparagraph 8.3.1 to delete reference to "arbitration" and to include the following:

If an extension of time is granted to the Contractor under the terms of the Contract Documents, the Contractor shall absorb all costs for General Conditions and General Requirements during the time extension.

B. Amend the first sentence of Subparagraph 8.3.1 to read "...by labor disputes not involving Subcontractors or Sub-Subcontractors retained by Contractor, fire, unusual delay..."

C. Add the following paragraph:

8.3.4 The Contractor shall have no claim for damages against either the Owner or the Architect by reason of delay if the date of Substantial Completion of the work is within the Contract Time as defined in Subparagraph 8.1.5.

ARTICLE 9 - PAYMENTS AND COMPLETION

9.3 APPLICATIONS FOR PAYMENTS

Subparagraph 9.3.1 -- The following sentence added:

9.3.1 The form of Application for Payment shall be notarized AIA Document G702, Application G702, Application and Certification for Payment, supported by AIA Document G703, Continuation Sheet.

9.6 PROGRESS PAYMENTS

A. Add Subparagraph 9.6.8 to define Progress Payment Percentages, as follows:

9.6.9 With respect to Work, _5_% Retainage shall be withheld from all construction work until the Work is 100% complete. Retainage on account of Work shall be released upon Substantial Completion of the Work, less 150% of the value of any uncompleted Work or Punch list items and the Owner's estimate of any post- Substantial Completion damages payable under Paragraph 8.1.5 of the Supplementary General Conditions. All Retainage shall be fully released within thirty (30) Days of Final Completion of the Work. No interest will be paid for payments due and unpaid under the Contract Documents.

9.10 FINAL COMPLETION AND FINAL PAYMENT

9.10.1 -- Delete in its entirety and substitute:

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 Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information

and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

Add the following to Paragraph 9.10.2:

The Contractor shall satisfy immediately any lien or encumbrance which, because of any act or default of the Contractor or any person or entity for whom Contractor is responsible, including its suppliers and subcontractors, is filed against the premises, and shall indemnify and save the Owner harmless against all resulting loss and expenses, including attorney's fees. The Contractor shall provide unconditional Final Lien Waivers from all subcontractors and material suppliers before project closeout.

9.10.4.3 – Add the following:

.5 related to any latent defects that are not apparent at the time of completion.

ARTICLE 10 – PROTECTION OF PERSONS & PROPERTY

10.3 HAZARDOUS MATERIALS AND SUBSTANCES

10.3.3 is deleted in its entirety.

10.3.6 is deleted in its entirety.

ARTICLE 11 – INSURANCE AND BONDS

11.2 OWNER'S LIABILITY INSURANCE

Delete 11.2.2 and 11.2.3 in their entirety and replace them with the following:

11.2.2 The Contractor is hereby informed that the Owner will carry Fire and Extended Coverage Insurance which will include provisions for vandalism but not provisions for theft, mysterious disappearance, or glass breakage.

11.2.3 The Contractor is hereby made aware that he will be held responsible for a complete job in every detail, and shall replace any contract items which are stolen or which mysteriously disappear and shall replace any broken glass before Owner's acceptance.

11.5 ADJUSTMENT AND SETTLEMENT OF INSURED LOSS

Delete 11.5.2 in its entirety.

ARTICLE 12 - UNCOVERING & CORRECTION OF WORK

The following subparagraph added:

12.2.4.1 Upon failure of the Contractor to make repairs within ten (10) days after notice from the Owner's Representative, the Owner shall have such work done and the cost thereof charged to the Contractor.

ARTICLE 13 – MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

Delete in its entirety and substitute:

13.1 The Contract shall be governed by the laws of the State of Missouri, and the parties agree that any dispute will be resolved in the Circuit Court of Boone County, Missouri, and each consents to the exclusive in personam jurisdiction and exclusive venue of that Court.

ARTICLE 14 – TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

14.1.1.4 is deleted in its entirety.

Subparagraph 14.1.3 -- Delete in its entirety and substitute:

If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment earned for Work executed, including reasonable overhead and profit.

14.2 TERMINATION BY THE OWNER FOR CAUSE

Subparagraph 14.2.1.4 -- Delete the following:

"substantial"

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

Subparagraph 14.4.3 -- Delete the following:

"and costs incurred by reason of the termination,"

ARTICLE 15 – CLAIMS AND DISPUTES

15.2 INITIAL DECISION

15.2.5 -- Delete in its entirety and substitute:

The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both.

The remaining provisions of Article 15 after 15.2.8 are deleted in their entirety.

Add the following Article 16:

§ 16 – ADDITIONAL CONDITIONS

§16.1 Each party to this Agreement represents to the other that: it has all requisite power, authority, licenses, permits and franchises, corporate or otherwise to execute and deliver this Agreement and performs its obligations hereunder; its execution, delivery and performance of this Agreement have been duly authorized, executed and delivered for it by the signatory so authorized, and constitutes its legal, valid and binding obligation; the persons executing this Agreement are fully authorized to do so; and, it has not received any notice, nor to the best of its knowledge there is pending or threatened any notice of any violation of any applicable laws, ordinances, regulations, rules, decrees, awards, permits or orders which would materially adversely affect its ability to perform hereunder.

§ 16.2 Nothing in this Agreement shall be construed as reserving to Owner any right to exercise any control over or to direct in any respect the conduct or management of business or operations of Contractor. The entire control or direction of such business and operation shall be in and shall remain in Contractor, subject only to Contractor's performance of its obligations under this Agreement. Neither Contractor nor any person performing any duties engaged in any Work on behalf of Contractor shall be deemed an employee or agent of Owner.

§16.4 Prior to commencement of the Work, Contractor shall provide to Owner a sworn affidavit and other sufficient documentation to affirm its enrollment and participation in a federal work authorization program with respect to the employees working in connection with this Agreement. Contractor shall also provide Owner a sworn affidavit affirming that it does not knowingly employ any person who is an unauthorized alien in connection with the Work.

§16.5 Contractor will be required to comply with the President's Executive Order No. 11246, Title VI and Section 3 of the 1968 HUD Act as pertaining to Equal Employment Opportunity through Affirmative Action. Contractor must comply with all applicable requirements of federal and state civil rights law and rehabilitation statutes and shall not discriminate based on race, religion, color, sex, national origin, age or disability.

§16.6 Contractor shall be required to comply with all applicable Policies and Procedures of Owner's Board of Education, as well as all applicable federal and state laws and regulations.

§16.6 The duties and obligations imposed by this Agreement and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of this Agreement. The provisions of this Paragraph will be as effective as if repeated specifically in this Agreement in connection with each particular duty, obligation, right, and remedy to which they apply.

§16.7 All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with this Agreement, as well as all continuing obligations indicated in this Agreement,

will survive final payment, completion, and acceptance of the Work or termination or completion of this Agreement or termination of the services of Contractor.

§16.8 The Contract Documents may be executed in one or more counterparts, each of which shall constitute an original and which, when taken together, shall constitute one entire Agreement. It shall be fully executed when each party whose signature is required has signed at least one counterpart even though no one counterpart contains the signatures of all the parties to these Contract Documents.

§16.9 These Contract Documents constitute the entire agreement between the parties hereto and there are no other understandings, written or oral, relating to the subject matter hereof, and may not be changed, modified or amended, in whole or in part, except in writing signed by Owner and Contractor.

END OF SECTION

SECTION 01 10 00
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: CPS Roseta Avenue Learning Center Accessibility, Safety and Security Improvements.

B. Owner's Name: Columbia Public School District.

C. Architect's Name: PWArchitects, Inc.

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 52 13 – Columbia Public Schools Construction Agreement.

1.03 OWNER OCCUPANCY

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

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

1.04 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

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

C. Existing building spaces may not be used for storage.

D. Utility Outages and Shutdown:
   1. Limit disruption of utility services to hours the building is unoccupied.
   2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days notice to Owner and authorities having jurisdiction.
   3. Prevent accidental disruption of utility services to other facilities.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

1.02 SCHEDULE OF VALUES

A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

B. Forms filled out by hand will not be accepted.

C. Submit a printed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet. Contractor's standard form or electronic media printout will be considered.

D. Submit Schedule of Values in duplicate within 15 days after date established in Notice to Proceed.

E. Include in each line item, the amount of Allowances specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.

F. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.

G. Revise schedule to list approved Change Orders, with each Application For Payment.

1.03 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

C. Forms filled out by hand will not be accepted.

D. Present required information in typewritten form.

E. Form: AIA G702 Application and Certificate for Payment and AIA G703 - Continuation Sheet including continuation sheets when required.

F. Execute certification by signature of authorized officer.

G. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored Products.

H. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.

I. Submit three copies of each Application for Payment.

J. Include the following with the application:
   1. Transmittal letter as specified for Submittals in Section 01 30 00.
   2. Construction progress schedule, revised and current as specified in Section 01 30 00.
   3. Partial release of liens from major Subcontractors and vendors.
   4. Affidavits attesting to off-site stored products.

K. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.04 MODIFICATION PROCEDURES

A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to the Contract Documents.

B. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.

C. Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract by issuing supplemental instructions on AIA Form G710.

D. Request For Information (RFI): Contractor shall submit RFI's for clarifications to the Contract Documents. In the RFI, the Contractor shall include the following:
   1. The Drawing number/Specification Section, including grid reference/paragraph number,
   2. The question regarding the item(s) referred to,
   3. The Contractor's interpretation of the item(s) referred to.

E. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change.

F. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 14 days.

G. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 60 00.

H. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
   1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
   2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
   3. For pre-determined unit prices and quantities, the amount will based on the fixed unit prices.
   4. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.
   5. The allowance for Overhead and Profit combined, including the total cost to the Owner, shall be based on the following schedules for change order adds and deducts:
      a. For the Contractor, for Work performed by the Contractor's own forces, 10% of the cost of labor and 5% of the cost of materials.
      b. For the Contractor, for Work performed by the Contractor's Subcontractor, 5% of the amount of the Subcontractor.
      c. For each Subcontractor, or Sub-subcontractor involved, for any work performed by that Subcontractor's own forces, 10% of the work cost.
      d. For each Subcontractor, for work performed by Subcontractor's Sub-subcontractors, 5% of the amount due the Sub-subcontractor.
      e. In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied

by a complete itemization of costs including labor, materials and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major costs items are Subcontracts, they shall be itemized also.

6. The allowance for Overhead and Profit shall account for ALL time associated with the change of scope. Compensation for time generating documents, reviewing documents, etc… will not be allowed.
7. The allowance for Payment and Performance Bond costs associated with change orders shall not exceed 1.5% and shall be used on both additive and deductive change orders.

I. Substantiation of Costs: Provide full information required for evaluation.
   1. Provide the following data:
      a. Quantities of products, labor, and equipment.
      b. Taxes, insurance, and bonds.
      c. Overhead and profit.
      d. Justification for any change in Contract Time.
      e. Credit for deletions from Contract, similarly documented.
   2. Support each claim for additional costs with additional information:
      a. Origin and date of claim.
      b. Dates and times work was performed, and by whom.
      c. Time records and wage rates paid.
      d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
   3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

J. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

K. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

L. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

M. Promptly enter changes in Project Record Documents.

1.05 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:
   1. All closeout procedures specified in Section 01 78 00.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preconstruction meeting.

B. Progress meetings.

C. Submittals for review, information, and project closeout.

D. Number of copies of submittals.

E. Submittal procedures.

F. Bid Document Expectations and Contractor Responsibilities.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

A. Owner will schedule a meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   2. Architect.
   3. Contractor.
   4. Subcontractors.

C. Agenda:
   1. Execution of Owner- Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.
   4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
   5. Designation of personnel representing the parties to Contract, Owner, Contractor and Architect.
   6. Background checks.
   7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   8. Scheduling.
   9. Use of the premises.
   10. Special project requirements.

3.02 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.

B. Architect will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Architect, as appropriate to agenda topics for each meeting.

D. Agenda:
   1. Review minutes of previous meetings.
   2. Review of Work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of off-site fabrication and delivery schedules.

7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to Work.

3.03 CONSTRUCTION PROGRESS SCHEDULE

A. Refer to Construction Progress Schedule Section 01 3216.

B. Submit updated schedule with each Application for Payment.

3.04 ELECTRONIC DOCUMENT SUBMITTAL

A. Summary:
1. Shop drawing and product data submittals shall be transmitted to Architect in electronic (PDF) format using Submittal Exchange, a website service designed specifically for transmitting submittals between construction team members.
2. The intent of electronic submittals is to expedite the construction process by reducing paperwork, improving information flow, and decreasing turnaround time.
3. The electronic submittal process is not intended for color samples, color charts, or physical material samples.

B. Procedures:
1. Submittal Preparation - Contractor may use any or all of the following options:
   a. Subcontractors and Suppliers provide electronic (PDF) submittals to Contractor via the Submittal Exchange website.
   b. Subcontractors and Suppliers provide paper submittals to General Contractor who electronically scans and converts to PDF format.
   c. Subcontractors and Suppliers provide paper submittals to Scanning Service which electronically scans and converts to PDF format.
2. Contractor shall review and apply electronic stamp certifying that the submittal complies with the requirements of the Contract Documents including verification of manufacturer / product, dimensions and coordination of information with other parts of the work.
3. Contractor shall transmit each submittal to Architect using the Submittal Exchange website, www.submittalexchange.com.
4. Architect / Engineer review comments will be made available on the Submittal Exchange website for downloading. Contractor will receive email notice of completed review.
5. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of the Contractor.
6. Submit paper copies of reviewed submittals at project closeout for record purposes in accordance with Section 017800 – Closeout Submittals

C. Costs:
1. General Contractor shall include the full cost of Submittal Exchange project subscription in their proposal. This cost is included in the Contract Amount. Contact Bob Caylor at Submittal Exchange, 1-800-714-0024 x2221 to verify cost prior to bid.
2. At Contractor's option, training is available from Submittal Exchange regarding use of website and PDF submittals. Contact Bob Caylor at Submittal Exchange, 1-800-714-0024 x2221.
3. Internet Service and Equipment Requirements:
   a. Email address and Internet access at Contractor's main office.
   b. Adobe Acrobat (www.adobe.com), Bluebeam PDF Revu (www.bluebeam.com), or other similar PDF review software for applying electronic stamps and comments.

3.05 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
1. Product data.
2. Shop drawings.

3. Samples for selection.
4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

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

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - CLOSEOUT SUBMITTALS.

3.06 SUBMITTALS FOR INFORMATION

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

B. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.

3.07 SUBMITTALS FOR PROJECT CLOSEOUT

A. When the following are specified in individual sections, submit them at project closeout:
1. Project record documents.
2. Operation and maintenance data.
3. Warranties.
4. Bonds.
5. Other types as indicated.

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

3.08 NUMBER OF COPIES OF SUBMITTALS

A. Documents for Review:
1. Small Size Sheets, Not Larger Than 8-1/2 x 11 inches: Submit the number of copies that Contractor requires, plus two copies that will be retained by Architect.
2. Submit an additional copy of submittals to Architect for mechanical and electrical engineering work, one of which will be retained by the engineer.
3. Larger Sheets, Not Larger Than 36 x 48 inches: Submit the number of opaque reproductions that Contractor requires, plus two copies that will be retained by Architect.
4. Submit an additional copy of submittals to Architect for mechanical and electrical engineering work, one of which will be retained by the engineer.

B. Documents for Information: Submit two copies.

C. Documents for Project Closeout: Make one reproduction of submittal originally reviewed. Submit one extra of submittals for information.

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

3.09 SUBMITTAL PROCEDURES

A. Transmit each submittal with AIA Form G810.fill out portions to be completed be the Contractor.

B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.

C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

E. Deliver submittals to Architect at business address.

F. Schedule submittals to expedite the Project, and coordinate submission of related items.

G. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.

H. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.

I. Provide space for Contractor and Architect review stamps.

J. When revised for resubmission, identify all changes made since previous submission.

K. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

L. Submittals not requested will not be recognized or processed.

M. Do not commence with Work that requires review of any submittals until receipt of returned, unrejected submittals.

N. One original copy of each submittal shall be available at the project site at all times. Do not allow submittals without appropriate final action marking to be used for the project.

O. Do not include requests for substitution on submittals: comply with procedures for substitution specified in Section 01 60 00 Product Requirements.

3.10 BID DOCUMENT EXPECTATIONS AND CONTRACTOR RESPONSIBILITIES

A. As outlined in the AIA General Conditions and Instructions to Bidders it is the responsibility of the Contractor to review and coordinate all drawings, specifications, submittals, etc… as necessary to properly coordinate the construction of the job from start until finish.

B. The Contractor shall not expect that the Bid Documents represent 100% complete and perfect set of documents. There are many items such as shop drawings that provide further information necessary to properly construct and complete the job.

C. The Contractor shall expect to spend time coordinating the various drawings, specifications, submittals, shop drawings, etc… and such effort may bring to light discrepancies between the documents necessary to properly construct and complete the job. The expectation is that these discrepancies are brought to the attention of the Architect to be further addressed.

D. The Contractor shall schedule the project and related activities in order to account for the activities above in a reasonable manner to allow adequate time for all parties to properly address.

E. The Contractor shall also expect that there will be Owner generated change requests that require time to properly coordinate, prices, etc… during the duration of the project.

F. The Contractor shall also expect that there will be Architect and Engineer generated clarifications and supplemental instructions that require time to properly coordinate, price, etc… during the duration of the project.

END OF SECTION

SECTION 01 32 16
CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, bar chart type.

1.02 SUBMITTALS

A. Within 15 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

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

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

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

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

E. Submit updated schedule with each Application for Payment.

F. Submit the number of opaque reproductions that Contractor requires, plus two copies that will be retained by Architect.

1.03 SCHEDULE FORMAT

A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

B. Sheet Size: Multiples of 8-1/2 x 11 inches.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Identify each item by specification section number.

C. Provide sub-schedules for each stage of Work identified in Section 01 10 00.

D. Provide sub-schedules to define critical portions of the entire schedule.

E. Include conferences and meetings in schedule.

F. Coordinate content with schedule of values specified in Section 01 20 00.

G. Provide legend for symbols and abbreviations used.

3.03 WEATHER DAYS

A. The Contractor's schedule shall anticipate normal local weather days on a month by month basis. Suspension of construction activity for the number of days each month as listed below shall be included in the Work and is not eligible for extension of Contract Time:

1.	January:	6 Days
2.	February:	6 Days
3.	March:	8 Days
4.	April:	5 Days
5.	May:	5 Days
6.	June:	3 Days
7.	July:	3 Days
8.	August:	3 Days
9.	September:	2 Days
10.	October:	2 Days
11.	November:	6 Days
12.	December:	5 Days

3.04 BAR CHARTS

A. Include a separate bar for each major portion of Work or operation.

B. Identify the first work day of each week.

3.05 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with Architect at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.06 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Update diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

3.07 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Architect, Owner, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

END OF SECTION

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. References and standards.

B. Quality assurance submittals.

C. Mock-ups.

D. Control of installation.

E. Tolerances.

F. Testing and inspection services.

G. Manufacturers' field services.

1.02 REFERENCE STANDARDS

A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008.

B. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation; 2011c.

C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2012.

D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2012a.

E. ASTM E329 - Standard Specification for Agencies Engaged Construction Inspection and/or Testing; 2011.

F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2009.

1.03 SUBMITTALS

A. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

B. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
   1. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
   1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
   2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

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

E. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
   1. Submit report in duplicate within 30 days of observation to Architect for information.

2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.04 REFERENCES AND STANDARDS

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

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

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

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

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

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

1.05 TESTING AND INSPECTION AGENCIES

A. Owner shall employ and pay for services of an independent testing agency to perform other specified testing.

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

C. Contractor shall coordinate all testing and inspections.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

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

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

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

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

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

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

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

3.02 MOCK-UPS

A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.

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

C. Accepted mock-ups shall be a comparison standard for the remaining Work.

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

3.03 TOLERANCES

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

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

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

3.04 TESTING AND INSPECTION

A. See individual specification sections for testing required.

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

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

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

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

F. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

G. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by PWArchitects, Inc.. Contractor shall be responsible for additional testing and costs.

3.05 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Architect 30 days in advance of required observations.
   1. Observer subject to approval of Architect.

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

3.06 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

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

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary utilities (electricity, lighting, heat, ventilation, and water).

B. Temporary telecommunications services.

C. Temporary sanitary facilities.

D. Temporary Controls: Barriers, enclosures, and fencing.

E. Security requirements.

F. Temporary fire protection and interim life safety requirements.

G. Vehicular access and parking.

H. Waste removal facilities and services.

I. Project identification sign.

J. Field offices.

1.02 TEMPORARY UTILITIES

A. Provide all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes from Owner's existing sources.

B. Temporary Electricity: Provide all extensions, wiring, safety accessories, and other miscellaneous items as required for use of Owner's existing services. Do not disrupt Owner's need for continuous service.
   1. Provide disconnect at connection to service.
   2. Temporary service shall comply with OSHA, Life Safety, and other applicable codes.

C. Temporary Water: Provide all extensions, piping, safety accessories, and other miscellaneous items as required for use of Owner's existing services.
   1. Provide shut-off valve and required backflow preventers.

D. Temporary Heat, Cooling, and Ventilation: Provide temporary devices as needed to maintain specific conditions for construction operations. Provide all extensions, ductwork, safety accessories, and other miscellaneous items as required for use of Owner's existing services.

E. Temporary Lighting: Provide temporary lighting devices as needed to maintain specified conditions for construction operations. Provide general service lighting of wattage and illumination required for construction operations.

1.03 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

B. Telecommunications services shall include:
   1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
   2. Telephone Land Lines: One line, minimum; one handset per line.
   3. Internet Connections: Minimum of one; DSL modem or faster.
   4. Facsimile Service: Minimum of one dedicated fax machine/printer, with dedicated phone line.

1.04 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures in designated area of project site. Provide at time of project mobilization.

B. Maintain daily in clean and sanitary condition.

1.05 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

C. Provide protection for plants designated to remain. Replace damaged plants.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

E. Provide protection of Owner's existing equipment.

1.06 FENCING

A. Provide 8 foot high fence around construction site; equip with vehicular and pedestrian gates with locks. Gates shall be designated by Owner's representative.

B. Barrier locations are shown on drawings.

1.07 EXTERIOR ENCLOSURES

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

B. In addition to normal opening protection provide similar enclosure system due to phasing requirements.

1.08 INTERIOR ENCLOSURES

A. Provide temporary partitions and ceilings as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.
   1. Owner will require the General Contractor to contain all construction dust. Temporary filters shall be provided at return air ducts.
   2. Schedule construction of temporary partitions as described by Owner to avoid interference with Owners" daily operations.
   3. HVAC systems within temporary enclosures are required to have negative pressure, supply grilles covered, and filters on the returns and exhaust to keep dust out of system.

B. Construction: Dust partitions for full construction duration shall be constructed using metal studs and plywood with seams and perimeters sealed with duct tape and made airtight. Dust partitions shall be insulated to reduce the transfer of sound. Dust partitions shall be fire rated as required by regulatory authorities. These partitions shall extend from floor to deck above. Doors in these partitions shall have gaskets, self-closing latching hardware with Best lockset, and damp or tacky walk-off mats on both sides of door. Where partition interferes with mechanical and electrical systems to remain consult with Owner for direction.

1.09 SECURITY

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

B. Coordinate with Owner's security program.

1.10 FIRE PROTECTION AND INTERIM LIFE SAFETY

A. Provide facilities required by authorities having jurisdiction. Institute Intermediate Life Safety Measures.

1.11 VEHICULAR ACCESS AND PARKING

A. Coordinate access and haul routes with governing authorities and Owner.

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

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

D. Designated existing on-site drives may be used for construction traffic with approval from Owner.

E. Existing parking areas as shown on drawings may be used for construction parking.

F. Contractor will be responsible for all damage to existing paving due to construction traffic. Contractor will be required to properly repair all damaged paving to a suitable condition. The Contractor is advised to document existing conditions at the start of construction.

1.12 WASTE REMOVAL

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

B. Provide containers with lids. Dispose of waste off-site periodically.

1.13 PROJECT IDENTIFICATION

A. Provide project identification sign as allowed by Owner. Include Owner, Architect, Consultants and others as deemed necessary.

B. Erect on site at location established by Owner.

C. No other signs are allowed without Owner permission except those required by law.

1.14 FIELD OFFICES

A. Office: Provide Field Offices within the project site or as directed by Owner, equipped with sturdy furniture, drawing rack and drawing display table.

B. Provide space for Project meetings with table and chairs to accommodate 10 people.

C. Space shall be properly heated and cooled.

1.15 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

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

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

C. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Transportation, handling, storage and protection.

C. Product option requirements.

D. Substitution limitations and procedures.

E. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 REFERENCE STANDARDS

A. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 SUBMITTALS

A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. Submit within 15 days after date of Agreement.
   2. For products specified only by reference standards, list applicable reference standards.

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

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

D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

E. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

PART 2 PRODUCTS

2.01 NEW PRODUCTS

A. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

B. Provide interchangeable components of the same manufacture for components being replaced.

C. Motors: Refer to Mechanical Sections. Specific motor type is specified in individual specification sections.

D. Wiring Terminations: See Electrical Sections.

2.02 PRODUCT OPTIONS

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

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

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

2.03 MAINTENANCE MATERIALS

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

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

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

A. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

C. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the substitution as for the specified product.
   3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.
   5. Will reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

D. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

E. Substitution Submittal Procedure:
   1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
   2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
   3. The Architect will notify Contractor in writing of decision to accept or reject request.

3.02 TRANSPORTATION AND HANDLING

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

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

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

3.03 STORAGE AND PROTECTION

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

B. Store with seals and labels intact and legible.

C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

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

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

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

G. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

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

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

END OF SECTION

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SECTION 01 70 00
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Pre-installation meetings.

C. Cutting and patching.

D. Cleaning and protection.

E. Starting of systems and equipment.

F. Demonstration and instruction of Owner personnel.

G. Closeout procedures, except payment procedures.

H. General requirements for maintenance service.

1.02 SUBMITTALS

A. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate Contractor.
   6. Include in request:
      a. Identification of Project.
      b. Location and description of affected work.
      c. Necessity for cutting or alteration.
      d. Description of proposed work and products to be used.
      e. Alternatives to cutting and patching.
      f. Effect on work of Owner or separate Contractor.
      g. Written permission of affected separate Contractor.
      h. Date and time work will be executed.

1.03 PROJECT CONDITIONS

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

B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

C. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

D. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.04 COORDINATION

A. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate occupancy requirements.

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

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

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

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

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

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

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

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

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00.

PART 3 EXECUTION

3.01 EXAMINATION

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

B. Verify that demolition is complete in alterations areas and areas are ready from installation of new work.

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

D. Examine and verify specific conditions described in individual specification sections.

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

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

3.02 PREPARATION

A. Cut, move, or remove items as necessary for access to alterations and renovation work. Replace and restore at completion.

B. Remove unsuitable material not marked from salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished work.

C. Remove debris and abandoned items from area and from concealed spaces.

D. Close openings in exterior surfaces to protect existing work and salvage items from weather and extremes of temperature and humidity. Insulate ducts and piping to prevent condensation in exposed areas.

E. Prepare surfaces and remove surface finishes to provide for proper installation of new work and finishes.

F. Clean substrate surfaces prior to applying next material or substance.

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

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

3.03 PREINSTALLATION MEETINGS

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

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

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

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

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

3.04 LAYING OUT THE WORK

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

B. Promptly notify Architect of any discrepancies discovered.

C. Periodically verify layouts by same means.

3.05 GENERAL INSTALLATION REQUIREMENTS

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

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

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

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

E. Make neat transitions between different surfaces, maintaining texture and appearance. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.

F. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.

G. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.

H. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.

I. Trim existing doors as necessary to clear new floor finish. Refinish trim as required.

J. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.

K. Re-cover and refinish work that exposes mechanical and electrical work exposed accidentally during the work.

3.06 CUTTING AND PATCHING

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

B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.

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

C. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.

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

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

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

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

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.

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

K. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

L. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.

M. Patch or replace surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.07 PROGRESS CLEANING

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

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

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

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

3.08 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

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

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

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

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

F. Prohibit traffic from landscaped areas.

3.09 SYSTEM STARTUP

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

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

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

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

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

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

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

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

3.10 DEMONSTRATION AND INSTRUCTION

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.

E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

G. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

3.11 ABOVE CEILING INSPECTIONS

A. Coordinate with Architect and Engineers to perform an above ceiling punchlist prior to the ceiling grid installation. Notify Architect when all above ceiling work is properly done to schedule this punchlist.

B. Once the punchlist items are corrected or completed notify the Architect to schedule a final review. No ceiling work shall start in rooms with deficiencies until the final review is complete and all items are corrected.

3.12 ADJUSTING

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

B. Testing, adjusting, and balancing HVAC systems: See Section 23 05 93.

3.13 FINAL CLEANING

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

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

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

D. Clean filters of operating equipment.

E. Clean debris from roofs, gutters, downspouts, and drainage systems.

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

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

3.14 CLOSEOUT PROCEDURES

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

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

C. Notify Architect when work is considered ready for Substantial Completion.
   1. The Architect will perform one inspection for Substantial Completion, upon the request of the Contractor.
      a. If the Architect is unable to issue the Certificate of Substantial Completion because the work is not considered to be substantially complete, the Contractor shall pay all subsequent inspection costs, including compensation for the Architect's services and expenses.
   2. Do not submit request for Substantial Completion until the following activities have been completed:
      a. Delivery of maintenance materials and tools.
      b. Demonstration of all equipment and systems.
      c. Instruction of Owner's personnel.
      d. Removal of temporary facilities and services.
      e. Change over to permanent locking systems.
      f. Final cleaning.
      g. The Owner has been informed of necessary procedures for changing over insurance coverages.
      h. The Owner has been informed of procedures for changing over operations.
      i. The Owner has received occupancy and operating permits from all authorities having jurisdiction.
      j. All activities specified to occur prior to Substantial Completion.

D. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.

E. Owner will occupy all of the building as specified in Section 01 10 00.

F. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.

G. Accompany Architect on preliminary final inspection.

H. Notify Architect when work is considered finally complete.

I. Complete items of work determined by Architect's final inspection.

3.15 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Furnish service and maintenance of components indicated in specification sections for 1 year from date of Substantial Completion. Unless the individual specifications calls for a specific period.

D. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

E. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

F. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

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SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

D. Owner Attachment C: 4.1 Contract Closeout Document

1.02 SUBMITTALS

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

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. Submit one set of completed documents prior to submission of the 50% pay request. This copy will be reviewed and returned after final inspection with comments. Revise content of all documents as required prior to final submission.
   3. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

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

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

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

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:

1. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
2. Field changes of dimension and detail.
3. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

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

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

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

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:
1. Product data, with catalog number, size, composition, and color and texture designations.
2. Information for re-ordering custom manufactured products.

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

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

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

E. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

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

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

C. Include color coded wiring diagrams as installed.

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

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

F. Provide servicing and lubrication schedule, and list of lubricants required.

G. Include manufacturer's printed operation and maintenance instructions.

H. Include sequence of operation by controls manufacturer.

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

J. Provide control diagrams by controls manufacturer as installed.

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

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

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

N. Include test and balancing reports.

O. Additional Requirements: As specified in individual product specification sections.

3.05 OPERATION AND MAINTENANCE MANUALS

A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

B. Prepare data in the form of an instructional manual.

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

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

E. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.

F. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.

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

H. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.

I. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   3. Part 3: Project documents and certificates, including the following:
      a. Shop drawings and product data.
      b. Air and water balance reports.
      c. Certificates.
      d. Photocopies of warranties and bonds.

J. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

K. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

3.06 WARRANTIES AND BONDS

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

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

C. Co-execute submittals when required.

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

3.07 ATTACHMENT C: 4.1 CONTRACT CLOSEOUT DOCUMENT

A. The following attached document defines the Owner specific closeout requirements and forms. This document will be attached to the Owner-Contractor Agreement.

END OF SECTION

ATTACHMENT 1:

4.1 CONTRACT CLOSEOUT

REQUIREMENTS INCLUDED:

Close-out Procedures (Substantial Completion Form)
Punch List (punch list format)
Final Cleaning
Asbestos Free Certification (Asbestos Free Material Form)
Project Record Documents
Operation and Maintenance Data
Systems Demonstration
Warranties and Bonds

CLOSEOUT PROCEDURES:

Comply with procedures stated in General Conditions of the Contract for issuance of Certificate of Substantial Completion.

Owner will occupy project for the purpose of installation of equipment and designed portions for conduct of business under provision stated in Certificate of Substantial Completion.

When Contractor considers Work has reached final completion, submit written certification that contract documents have been reviewed, work has been inspected, and that work is complete in accordance with contract documents and ready for owner inspection.

In addition to submittals required by the conditions of the Contract, provide submittals required by governing authorities, and submit a final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.

The owner will, if necessary, issue a final change order reflecting approved adjustments to Contract Sum not previously made by Change Order.

PUNCH LIST:
A punch list shall be generated by the contractor upon completion of the Certificate of Substantial Completion form. A copy of this punch list is to be provided along with substantial completion form to the owner. The contractor shall continue to work off all items until such time all work is complete and the contractor is ready for final inspection by the owner. Final payment will not be made until all items are satisfactory to the owner.

FINAL CLEANING:

Remove waste and surplus materials, rubbish and construction facilities from the project and from the site. Prior to final cleaning, all areas shall be in a broom clean condition. Owner may provide final cleaning after final acceptance.

ASBESTOS FREE CERTIFICATION:

Each Contractor shall execute a certification to the Owner that no asbestos material has been furnished or installed on this project.

PROJECT RECORD DOCUMENTS:

Store documents separate from those used for construction.

Keep documents current; do not permanently conceal any work until required information has been recorded.

Drawings: Legibly mark to record actual construction:

Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

Identify the location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.

Field changes of dimension and detail.

Changes made by Field Directive or by Change Order.

Provide any discovery details not on original Contract Drawings.

Specifications and Addenda: Legibly mark each Section to record:

Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.

Changes made by Field Order or by Change Order.

At Contract Close-out, submit documents with transmittal letter containing date, project title, Contractor's name and address, list of documents, and signature of Contractor.

OPERATION AND MAINTENANCE DATA:

Provide data for:

Mechanical Equipment and Controls
Electrical Equipment and Controls

Submit three sets prior to final inspection, bound in 8-1/2" x 11" three-ring side binders with durable plastic covers.

Provide a separate volume for each system, with a table of contents and index tabs for each volume.

Part 1: Directory, listing names, addresses, and telephone numbers of: Architect, Engineer and Contractors.

Part 2: Operation and maintenance instructions, arranged by system. For each system, give names, addresses and telephone numbers of contractors, subcontractors and suppliers.

List:

Appropriate design criteria
List of equipment
Parts list
Operating instructions
Maintenance instructions on equipment
Maintenance instructions for finishes
Shop drawings and product data
Warranties

SYSTEMS DEMONSTRATION:

Prior to final inspection, demonstrate operation of each system to Owner representative. The orientation shall be scheduled by each Contractor and approved by the Owner.
Instruct Owner's personnel in operation, adjustment, and maintenance of equipment and systems, using the operation and maintenance data as the basis of instruction.

WARRANTIES AND BONDS:

Provide duplicate, notarized copies. Execute Contractor's submittals and assemble documents executed by subcontractors, suppliers and manufacturers. Provide table of contents and assemble in binder with durable plastic cover.
Submit material prior to final application for payment. For equipment put into use with Owner's permission during construction, submit within 10 days after first operation. For items of Work delayed materially beyond Date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

AFFIDAVIT: SUBSTANTIAL COMPLETITION

I am authorized to make this affidavit on behalf of _____
General Contracting Firm

_____who/which is the (Contractor) for

_____

Project Name; Project Number

In performing the Contract for the (Construction) of the above stated project, I certify that all work is completed to the specifications and drawings issued for construction purposes to include all addendums, directives and changes issued for construction. I also certify that a punch list has been generated using the form provided and (Contractor) shall diligently work toward completion.

DATED this _____day of _____, 2016

By: _____
Name Title

Firm: _____

License #:_____

AFFIDAVIT: PUNCH LIST ITEMS

I am authorized to make this affidavit on behalf of _____
General Contracting Firm

_____who/which is the (Contractor) for

_____

Project Name; Project Number

In performing the Contract for the (Construction) of the above stated project, I certify that all punch list items have been completed or resolved to the owner's satisfaction.

DATED this _____day of _____, 2016

By:_____
Name Title

Firm:_____

License #:_____

AFFIDAVIT: NON-USE OF
ASBESTOS-CONTAINING BUILDING MATERIALS

I am authorized to make this affidavit on behalf of _____
General Contracting Firm

_____who/which is the (Contractor) for

_____

Project Name; Project Number

In performing the Contract for the (Construction) of the above stated project, I certify that no building materials containing asbestos were ***specified, used or incorporated*** in any way in the completed project.

DATED this _____day of _____, 2016

By:_____
Name Title

Firm:_____

License #:_____

AFFIDAVIT: WORKER ELIGIBILITY VERIFICATION

STATE OF _____)
) ss
COUNTY OF _____)

On this _____ day of _____, 20_____, before me appeared _____, personally known to me or proved to me on the basis of satisfactory evidence to be a person whose name is subscribed to this affidavit, who being by me duly sworn, deposed as follows:

My name is _____, and I am of sound mind, capable of making this affidavit, and personally certify the facts herein stated, as required by Section 285.530, RSMo, to enter into any contract agreement with the state to perform any job, task, employment, labor, personal services, or any other activity for which compensation is provided, expected, or due, including but not limited to all activities conducted by business entities:

I am the _____ of _____, and I am duly authorized, directed, and/or empowered to act officially and properly on behalf of this business entity.

I hereby affirm and warrant that the aforementioned business entity is enrolled in a federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, and the aforementioned business entity shall participate in said program with respect to all employees working in connection to work under the within state contract agreement with the Columbia Public School District (CPS). ***I have attached documentation to this affidavit to evidence enrollment/participation by the aforementioned business entity in a federal work authorization program, as required by Section 285.530, RSMo***.

In addition, I hereby affirm and warrant that the aforementioned business entity does not and shall not knowingly employ, in connection to work under the within state contract agreement with CPS, any alien who does not have the legal right or authorization under federal law to work in the United States, as defined in 8 U.S.C. § 1324a(h)(3).

I am aware and recognize that, unless certain contract and affidavit conditions are satisfied pursuant to Section 285.530, RSMo, the aforementioned business entity may be held liable under Sections 285.525 though 285.550, RSMo, for subcontractors that knowingly employ or continue to employ any unauthorized alien to work within the state of Missouri.

I acknowledge that I am signing this affidavit as a free act and deed of the aforementioned business entity and not under duress.

_____
Affiant Signature

Subscribed and sworn to before me this _____ day of _____, 20_____.

_____
Notary Public

My commission expires: _____

[Documentation of enrollment/participation in a federal work authorization program attached]

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SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of built site elements.

B. Selective demolition of building elements for alteration purposes.

C. Abandonment and removal of existing utilities and utility structures where designated on drawings.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fill Material: As specified in Section 31 23 23 - Fill.

PART 3 EXECUTION

3.01 SCOPE

A. Remove designated portions of existing building, site elements and utilities as required to properly complete new work.

B. Remove and protect items designated, for salvage and relocation.

C. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 22 00.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with other requirements specified in Section 01 70 00.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Use of explosives is not permitted.
   3. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   4. Provide, erect, and maintain temporary barriers and security devices.
   5. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   6. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   7. Do not close or obstruct roadways or sidewalks without permit.
   8. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
   9. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

C. Do not begin removal until receipt of notification to proceed from Owner.

D. Do not begin removal until built elements to be salvaged or relocated have been removed.

E. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.

3. Stop work immediately if adjacent structures appear to be in danger.

F. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

G. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

H. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction indicated on drawings.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

D. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications, and other similar designated items): Remove existing systems or portions thereof and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to the Owner.
   4. Do not close, shut off, or disrupt existing utility branches or take- offs that are in use without at least 3 days prior written notification to the Owner.
   5. Do not disrupt public utilities with permit from authority having jurisdiction.
   6. Verify that abandoned services serve only abandoned facilities before removal.

7. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

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

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

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SECTION 04 20 00

UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete Block.

B. Split-Face and Chiseled-Face Block (exterior).

C. Filled and Polished Ground Face Block (interior).

D. Clay Facing Brick.

E. Mortar and Grout.

F. Reinforcement and Anchorage.

G. Flashings.

H. Accessories.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

1.03 PERFORMANCE REQUIREMENTS

A. Provide unit masonry that develops indicated net-area compressive strengths (f'm) at 28 days.

B. Determine net-area compressive strength (f'm) of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for dampproofing, masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

C. Samples: Submit four samples of filled and polished ground face block, facing brick and architectural block units to illustrate color, texture, and extremes of color range.

D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

E. Shop Drawings: Stainless Steel Drip Flashings; Indicate material profile, jointing pattern, jointing details, fastening methods, flashing terminations, and installation details.`

F. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.

G. Test Reports: Concrete masonry manufacturer's test reports for units with integral water repellent admixture.

H. Manufacturers Printed Installation Instructions of all products.

I. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
   1. Include test reports, per ASTM C 780, for mortar mixes required to comply with property specification.
   2. Include test reports, per ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
   3. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

4. Cold-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with cold-weather requirements for masonry installed when ambient air temperature is less than 40º F or temperature is expected to drop below 32º F within 24 hours.

1.05 QUALITY ASSURANCE

A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.

B. Comply with provisions of the Brick Industry Association (BIA) Technical Notes on Brick Construction, except where exceeded by requirements of the contract documents.

C. Comply with provisions of National Concrete Masonry Association (NCMA) Tek Notes, except where exceeded by requirements of the contract documents.

D. Fire Rated Assemblies: Conform to applicable code for UL Assemblies shown on drawings.

E. Ground Face Block: Concrete blocks for grinding shall conform to ASTM C90. After the initial grinding process to expose the variegated colors of the natural aggregates, fill the pores and interstices of filled and polished units with a cementitious grout and polish smooth in a multi-stage polishing process. Both the ground face and filled and polished surfaces shall have a factory-applied heat-treated acrylic or water-based sealer finish. All units shall contain a manufacturer-approved integral water-repellent CMU admixture at the time of manufacture. Filled and polished units shall conform to the requirements of ASTM C744-08 and all applicable Federal Specifications.

1.06 MOCK-UP

A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include reinforcement, mortar and accessories, structural backup, wall openings, flashings, wall insulation, and weather barrier in mock-up. Opening shall be a minimum of 2' x2' and illustrate complete head, jamb and sill masonry and flashing details. In separate opening, install a single glass block wall tube specified in Section 04 23 10 Glass Block Wall Tubes. Coordinate mock up with all related Sections.

B. Construct a mock- up panel, no less than 4' x 4', of ground face units of each type and color to be used in the project.

C. Build, protect and retain mock-up during construction as a standard for judging the completed work.

D. Locate where directed.

E. Mock-up may not remain as part of the Work.

F. Mock- up must be approved by Architect before proceeding with Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

B. Filled and Polished Ground Face Block shall be delivered to the jobsite on covered banded pallets with cardboard between layers. Store pallets in single stacks on level ground and cover with waterproof covering (e.g., tarpaulins) to protect the blocks from inclement weather. Handle blocks carefully to avoid breakage and damage to the finished surfaces.

1.08 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches (600 mm) down both sides and hold cover securely in place.
2. Where 1 wythe of multi-wythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe and hold cover in place.

3. Mason is responsible for the protection of the brick ledge flashing after completion by the waterproofing Subcontractor.
4. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.
5. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
    a. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
    b. Protect sills, ledges, and projections from mortar droppings.
    c. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
    d. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
    e. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602 and the following:
    f. The Contractor shall maintain masonry materials and surrounding air temperatures above 40 deg F (4 deg C) (with enclosures and heat sources on both sides of the wall and batching area also enclosed and heated as a minimum) prior to, during, and 48 hours after completion of the Work when temperatures are 40 deg F (4 deg C) or below.
    g. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.
    h. Cleaning shall not diminish the appearance or weather resistance of the building exterior. Protect adjacent permanent surfaces from cleaning materials.
    i. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
    1. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
    2. Special Shapes: Provide non-standard blocks configured for corners, lintels, headers, control joint edges, bull nose for both interior concrete block and filled, ground and polished block, and other detailed conditions.
    3. Load-Bearing and Non Load Bering Units: ASTM C90, normal weight.
        a. Both hollow and solid block. All block hollow except 4 inch nominal
        b. Exposed faces: Manufacturer's standard color and texture. Use ground face block where indicated on drawings.
        c. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2000 psi
        d. Filled and Polished Ground Face Block: Trendstone Plus® filled and polished masonry units.
            1) Colors as indicated on drawings.
            2) Fill and polish ALL surfaces exposed to view except as noted on drawings.
            3) Factory applied clear satin gloss acrylic sealer.
            4) Substitutions: See Section 016000- Product Requirements.
        e. Split-Face and Chiseled-Face Block: York Split-Face and York Chiseled-Face.
            1) Substitutions: See Section 016000- Product Requirements.

2.02 BRICK UNITS

A. Facing Brick: ASTM C216, Type FBX, Grade SW; Tested and rated according to ASTM C 67 "not effloresced".
   1. Color, texture and blend: As shown on drawings.
   2. Actual size: 3-5/8" x 7-5/8" x 2-1/4".
   3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.

2.03 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150, Type I.
   1. Not more than 0.60 percent alkali.
   2. Hydrated Lime: ASTM C207, Type S.
   3. Mortar Aggregate: ASTM C144.
   4. Grout Aggregate: ASTM C404.
   5. Water: Clean and potable.
   6. Integral Water Repellent Admixture for Mortar and Grout: Polymeric liquid admixture added to mortar and grout at the time of manufacture.
      a. Use only in combination with masonry units manufactured with integral water repellent admixture (ground face and ground, filled and polished block).
      b. Use only water repellent admixture for mortar and grout from the same manufacturer as water repellent admixture in masonry units.
      c. Meet or exceed performance specified for water repellent admixture used in masonry units.

2.04 REINFORCEMENT AND ANCHORAGE

A. Manufacturers of Joint Reinforcement and Anchors:
   1. Blok-Lok Limited: www.blok-lok.com.
   2. Hohmann & Barnard, Inc (including Dur-O-Wal brand): www.h-b.com.
   3. WIRE-BOND: www.wirebond.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.
   5. Reinforcing Steel: ASTM A615/A615M Grade 60 (420) deformed billet bars; uncoated.
   6. Vertical Rebar Positioners: H and B- RB Rebar Positioner and H and B Twin Rebar Positioner.
   7. Horizontal Rebar Positioner: DurO Wal DA812.
   8. Rebar Lap- Joint Ties: H and B Spyra- Lox Rebar Lap- Joint Ties
   9. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.
   10. Partition Top Anchor: H and B, PTA 420 HS, hot dip galvanize, or as detailed on the Structural Drawings.
   11. Single Wythe Joint Reinforcement: Ladder type; ASTM A 82/A 82M steel wire, mill galvanized to ASTM A 641/A 641M, Class 3; 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.
   12. Adjustable Multiple Wythe Joint Reinforcement: Ladder type with adjustable ties spaced at 16 in on center and fabricated with moisture drip; ASTM A 82/A 82M steel wire, hot dip galvanized after fabrication to ASTM A 153/153M, Class B; 0.1875 inch side rods with 0.1483 inch cross rods and adjustable components of 0.1875 inch wire; width of components as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from each masonry face. (H and B 270 Ladder- Adjustable Ladder Eye and Pintle ties).
      a. Vertical adjustment: Not less than 2 inches.
   13. Brick Expansion/ Control Joint Stabilizers: H and B Slip- Set Stabilizer, Type 304 Stainless Steel.

2.05 FLASHINGS

A. Stainless Steel/Polymer Fabric Flashing: ASTM 167 stainless steel sheet bonded with rubber-based adhesive to one sheet of polymer fabric.
   1. Manufacturer:
      a. York Manufacturing, Inc; Multi-Flash SS: www.yorkmfg.com.
      b. Hohmann and Barnard Inc; Product Mighty- Flash- SA.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

B. Stainless Steel Drip Edge Flashing: Custom flashing as shown on the drawings, ASTM A666, Type 304, soft temper; 26 gage (0.45 mm) thick minimum; finish 2B. Coordinate with Section 07 62 00, Sheet Metal Flashing and Trim.

C. Lap Sealant: Butyl type as specified in Section 07 90 05.

2.06 ACCESSORIES

A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
   1. Manufacturers:
      a. Blok-Lok Limited: www.blok-lok.com.
      b. Hohmann & Barnard, Inc (including Dur-O-Wal brand); Product RS Series- Rubber Control; Joint: www.h-b.com.
      c. WIRE-BOND: www.wirebond.com.
      d. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Joint Filler: Specified in Section 07 90 05.
   3. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
      a. Mortar Diverter: Panels designed for installation at flashing locations.
         1) Manufacturers:
            (a) Mortar Net USA, Ltd; Mortar Net with Insect Barrier: www.mortarnet.com.
            (b) H-B; Product Mortar Trap; www.h-b.com.
            (c) Keene Building Products; Product Keene Stone; www.keenebuilding.com
            (d) Substitutions: See Section 01 60 00 - Product Requirements.
   4. Weep Vents: Polyethylene Where shown on drawings (primarily to be used in conjunction with brick.
      a. Manufacturers:
         1) Hohmann & Barnard, Inc; Product H-B QV- Quadro- Vent: www.h-b.com.
         2) Substitutions: See Section 016000 - Product Requirements.
   5. WeepsTubes: Polyethylene tubing with inserted cotton sash and insect screen at locations shown on drawings (primarily to be used in conjunction with Concrete Block).
      a. Manufacturers:
         1) Basis of Design: Hohmann and Barnard, Inc (H-B); Product #341W/S with stainless steel screen. Provide a minimum of 18 inch exposure on the interior of the cavity.: www.h-b.com.
         2) Substitutions: See Section 01 60 00 - Product Requirements.
   6. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.Use only products and methods approved in writing by the masonry manufacturer for each type of masonry being cleaned.
   7. Primer for Stainless Steel/Polymer Fabric Flashing: H-B Self- Adhering Primer.
   8. Mastic/ sealant: H - B Mastic.
   9. Termination Bar: H - B T-2, Aluminum.
   10. Weather Barrier: Coordinate with Section 07 25 00, Weather Barriers.

2.07 LINTELS

A. Provide masonry lintels where shown and where openings of more than 12 inches for brick size units and 24 inches for block size units without structural steel or other supporting lintels. Reinforce as shown on Structural Drawings.

B. Steel lintels specified in Section 05 50 00.

2.08 MORTAR AND GROUT MIXES

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
   1. All masonry block and brick below grade: Type S.
   2. Facing brick, concrete block, and cast stone masonry veneer: Type N.
   3. Grout: ASTM C476. Consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.
   4. Admixtures: Use admixtures only if approved by Architect in writing. Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.
   5. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS

A. Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

3.04 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
   1. Bond: Running.
   2. Coursing: One unit and one mortar joint to equal 8 inches.
   3. Mortar Joints: Concave.
   4. Brick Units:
      a. Bond: Running and stacked as indicated on the drawings.
      b. Coursing: Three units and three mortar joints to equal 8 inches.
      c. Mortar Joints: Concave.

3.05 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

D. Remove excess mortar and mortar smears as work progresses.

E. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.

F. Interlock intersections and external corners, except for units laid in stack bond.

G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

H. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

I. Cut mortar joints flush where weather barrier is applied. Coordinate with Section 07 25 00, Weather barriers.

J. Cut mortar joints flush where cavity insulation vapor barrier adhesive is applied. Coordinate with Section 07 25 00, Weather barriers.

K. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.06 WEEPS/CAVITY VENTS

A. Install weep tubes (primarily in conjunction with concrete block) in veneer and cavity walls at maximum 16 inches on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls. Install in accordance with manufacturers printed installation instructions.

B. Install weep vents (primarily in conjunction with brick) in veneer and cavity walls at maximum 24 inches on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls. Install in accordance with manufacturers printed installation instructions.

3.07 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.

C. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.Install in accordance with manufacturers printed installation instructions.

3.08 REINFORCEMENT AND ANCHORAGE - GENERAL

A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place continuous joint reinforcement in first joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches.

3.09 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHE MASONRY

A. Install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place continuous joint reinforcement in first joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches.

3.10 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. Install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place continuous joint reinforcement in first joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches.

E. Masonry Back-Up: Embed anchors in masonry back-up to bond veneer at maximum 1.77 sq ft of wall surface per anchor. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

3.11 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted such as at lintels, shelf angles or bottoms of walls.

B. Remove or cover protrusions or sharp edges that could puncture flashings.

C. Install stainless steel drip edge flashing specified in Section 076000, in full bed of mastic.

D. Lap stainless steel seams 4 inches and "bayonet" seal watertight with mastic.

E. Extend stainless steel metal flashings through exterior face of masonry and turn down to form drip as shown on drawings. Install joint sealer with bond breaker below drip edge to prevent moisture migration under flashing.

F. Apply primer for Stainless Steel/Polymer Fabric Flashing to substrate at approximately 150 s.f. per gallon. Let primer dry for approximately 30 minutes or when dry to touch. Re- prime surface if primed area has been left exposed for 24 hours.

G. Apply Stainless Steel/Polymer Fabric Flashing to primed surfaces including drip edge flashing, in sections of 8 ft. in length or less. Lap all seams a minimum of four inches. Use a roller to firmly press membrane onto surface without air pockets. Neatly apply mastic on top of the overlap at 1/8"-1/4" thickness x 1-1/2“ wide.

H. Extend Stainless Steel/Polymer Fabric Flashing throughwall full width at such interruptions and turn up at least 16 inches onto back up wall (6 inches above cavity mortar control). Use a roller to firmly press membrane onto surface of wall and drip edge flashing without air pockets or wrinkles. Neatly apply mastic on top at 1/8"-1/4" thickness x 1-1/2 " wide. Install termination bar at top of flashing and seal. Turn both stainless steel and membrane flashings up at ends a minimum of 4 inches to form watertight pan for end dams.

I. Hold the outer edge of Stainless Steel/Polymer Fabric Flashing back 3/4 inch from the exposed face of wall and adhere to stainless steel drip edge flashing.Install a neatly tooled bead of mastic along the front edge of membrane using a caulking gun.

3.12 LINTELS

A. Install loose steel lintels over openings where indicated.

B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.
   1. Do not splice reinforcing bars.
   2. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
   3. Place and consolidate grout fill without displacing reinforcing.
   4. Allow masonry lintels to attain specified strength before removing temporary supports.
   5. Maintain minimum bearing on each side of opening as indicated in structural drawings.

3.13 GROUTED COMPONENTS

A. Lap splices minimum distance shown on structural drawings. Tie together with Rebar Lap- Joint Ties.

B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

C. Place and consolidate grout fill without displacing reinforcing.

3.14 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control and expansion joints.

B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

C. Form expansion joint as detailed.

D. Space control joints at maximum 20 ft on center at exterior locations and 20 to 30 ft on center at interior locations or as shown on drawings. For joints not shown on drawings, obtain Architects approval prior to installation.

3.15 BUILT-IN WORK

A. As work progresses, install built-in metal door frames, glazed frames, anchor bolts, and plates and other items to be built into the work and furnished under other sections.

B. Install built-in items plumb, level, and true to line.

C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
   1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
   2. Do not build into masonry construction organic materials that are subject to deterioration.

3.16 TOLERANCES (FOR SINGLE WYTHE MASONRY VERIFY WITH ARCHITECT WALL SURFACE REQUIRING THE MORE STRINGENT TOLERANCE)

A. Maximum Variation from Alignment of Columns: 1/4 inch.

B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.

G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.17 CUTTING AND FITTING

A. Cut and fit for pipes, conduit, and sleeves. Coordinate with other sections of work to provide correct size, shape, and location.

B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.18 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.

B. Clay Masonry Unit Tests: Test each variety of clay masonry in accordance with ASTM C67 requirements, sampling 5 randomly chosen units for each 50,000 installed.

C. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140 for conformance to requirements of this specification.

D. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.

3.19 CLEANING

A. Remove excess mortar and mortar droppings.

B. Replace defective mortar. Match adjacent work.

C. Before full-scale application of cleaning products begins, review manufacturers application data to determine suitability of cleaning of specific materials and surfaces. Apply cleaner to test area to determine optimum dwell time, compatibility, effectiveness, rinsing and other pertinent application procedures that would affect the effectiveness of the cleaning operations with respect to desired results. Use the least caustic materials and methods required to produce desired results. Allow test areas to dry thoroughly before evaluating the final results with the Architect.

D. Clean soiled surfaces with cleaning solution in accordance with manufacturer's recommendations. If improvements are necessary to achieve proper cleaning of surfaces, alternate cleaning methods may be used only with approval of the Architect..

E. Use non-metallic tools in cleaning operations.

3.20 FILLED AND POLISHED GROUND BLOCK SEALER

A. Apply a finish coat of manufacturers water based sealer to walls after cleandown and when the walls are dry. Apply with airless sprayer, evenly to cover the entire surface without forming drips or runs.

3.21 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel items.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Plates: ASTM A283.

C. Pipe: ASTM A53/A53M, Grade B Schedule 40, hot-dip galvanized finish.

D. Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, plain.

E. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

F. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

G. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED ITEMS

A. Ladders (Roof Access): Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.

1. As detailed on drawings.

B. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.

C. Lintels: As detailed; galvanized finish.

D. Door Frames for Overhead Door Openings: Channel sections; galvanized finish.

E. Downspout Boots: contoured interior flow design with no boxed corners, weld seams or choke points; include integral lug slots and stainless steel fasteners.
   1. Configuration: Contractor to determine which configuration applies to field conditions as all configurations are acceptable and site conditions may dictate one style over the other so there may be multiple types for this project. Offset/O-Series, Angular/A-Series or Ninety Degree/N-Series)
   2. Material: Cast iron; ASTM A48/A48.
   3. Finish: Manufacturer's standard powder coat finish.
   4. Color: To be selected by Architect from manufacturer's standard range.
   5. Accessories:
      a. Manufacturer's standard stainless steel fasteners for mounting onto building wall
      b. Flexible rubber adapter for connection to drainage pipe
   6. Products:
      a. Downspoutboots.com, a division of J. R. Hoe & Sons; 101 Ironwood Rd., Middlesboro, KY 40965: www.downspoutboots.com
   7. Size top bell to accept downspout size.
   8. Lengths:
      a. Standard length shall be 36".
      b. Playground boots shall be 60" tall for added protection.

2.04 FINISHES - STEEL

A. Prime paint all steel items.
   1. Exceptions: Galvanize steel lintels and overhead door frames.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.05 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components indicated on shop drawings.

D. Perform field welding in accordance with AWS D1.1/D1.1M.

E. Obtain approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

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SECTION 06 41 00
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Specially fabricated cabinet units. Modular casework meeting or exceeding specified criteria may at Contractors option be substituted in lieu of specially fabricated cabinet units.

B. Countertops.

C. Solid Surface Sinks, Sills and Surrounds

D. Cabinet hardware.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

1. Provide the information required by AWI/AWMAC/WI Architectural Woodwork Standards, Appendix A605- A607.

1.03 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage in compliance with in accordance with AWI//AWMAC/WI Architectural Woodwork Standards Section 1700, Installation of woodwork, for Custom Grade..

1.05 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Approved manufactured modular casework meeting or exceeding specified criteria may at Contractors option be substituted in lieu of specially fabricated cabinet units. If modular casework is to be substituted, it must be submitted and approved as a substitution prior to bidding. The following are pre-approved:

1. Precision Millwork Co.
2. LSI Corp.
3. The Millwork Shoppe.
4. PR Bean Co.
5. TMI.
6. Cabinet Masters, Inc.

B. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 CABINETS

A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI//AWMAC/WI Architectural Woodwork Standards Section 400, Architectural Cabinets, for Custom Grade.

2.03 LAMINATE MATERIALS

A. Manufacturers:

1. Formica Corporation: www.formica.com.
2. Panolam Industries International, Inc: www.nevamar.com.

3. Wilsonart International, Inc: www.wilsonart.com.
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

C. Provide specific types as follows:
1. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, colors as scheduled, finish as scheduled. See Finish Schedule on Drawings
2. Vertical Surfaces: VGS, 0.028 inch nominal thickness, colors as scheduled, finish as scheduled. See Finish Schedule on Drawings
3. Cabinet Liner: CLS, 0.020 inch nominal thickness, colors as scheduled, finish as scheduled.See Finish Schedule on Drawings
4. Backer Sheet: Paper backing required on ALL concealed backside of panels faced with high pressure decorative laminate.

2.04 PLASTIC LAMINATE COUNTERTOPS

A. Plastic Laminate Countertops: Medium density fiberboard substrate covered with HPDL, conventionally fabricated and self-edge banded. Provide laminate backer on all concealed backsides of panels faced with high pressure decorative laminate.

B. Plastic Laminate Counter Top Support Brackets: Where countertops are unsupported by cabinets or walls, for a clear span of over 36 inches, install support brackets at 36 inches on center.
1. Product: Lymann Associates Inc, Pre- finished Counter Top Supports; www.lymanassociates.com/topsupport.htm.
a. Finish: High impact powdercoat, color; Black.

2.05 EPOXY RESIN COUNTERTOPS

A. Manufacturers:
1. Durcon, Inc.: www.durcon.com; Product:CLASSICTOPS (Basis of Design).
2. Thermo Scientific: www.thermoscientific.com.
3. Prime Industries, Inc: www.primeindustriesinc.com.
4. Substitutions: See Section 01 60 00 - Product Requirements.
5. Epoxy Resin Countertops: Filled epoxy resin molded into homogenous, non-porous sheets; no surface coating and color and pattern consistent throughout thickness; with integral or adhesively seamed components.
a. Flat Surface Thickness: 1 inch, nominal.
b. Flammability: Self-extinguishing, when tested in accordance with ASTM D635.
c. Surface Finish: Smooth, non-glare.
d. Color: See Finish Schedule on Drawings.
e. Back and End Splashes: Same material, same thickness; Integral molded with countertop.
f. Edge Design: Classictop Radius.
6. Sinks: Same material, same color; integrally molded with counter; bottom sloped to outlet; molded outlets; drain outlet located in back corner.
a. Sides and Ends: 1/2 inch minimum thickness.
b. Bottoms: 5/8 inch minimum thickness.
c. Interior Corners: 1 inch minimum radius.
d. Clamping collars for 1-1/2 or 2 inch diameter waste pipe, for sealed but not permanent connection.
e. Steel channel supports front to back on each side, fastened to underside of top to support twice full sink weight.
f. Color: Match Countertop.

2.06 SOLID SURFACE COUNTERTOPS, SINKS, SILLS AND SURROUNDS

A. Manufacturers:
   1. Corian, Inc.: www.corian.com; (Basis of Design).
   2. Formica Group: www.formica.com.
   3. Wilsonart: www.wilsonart.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Thickness: ½".

C. Integral sink to match countertop and backsplash.

D. Color: See Drawings.

2.07 ACCESSORIES

A. Adhesive: Type recommended by AWI/AWMAC to suit application.

B. Fasteners: Size and type to suit application.

C. Concealed Joint Fasteners: Threaded steel.

D. Grommets: Standard plastic or rubber grommets for cut-outs, in color to contrast with adjacent surface.

2.08 HARDWARE

A. Hardware: BHMA A156.9, types as indicated for quality grade specified.

B. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards and coordinated shelf rests, satin chrome finish, for nominal 1 inch spacing adjustments. BHMA No. B04071 standards with BHMA No. B04081 closed shelf rests. Knape and Vogt standards and clips are acceptable as well.

C. Drawer and Door Pulls: "U" shaped wire pull, steel with satin finish, 4 inch centers.

D. Cabinet and Drawer Locks: Keyed lock with strike plate, two keys per lock, master keyed, steel with satin finish. Provide one lockset and strike plate for each cabinet door and drawer. Mortise all strike plates so that they are flush with the surface of the cabinet. Key all of the cabinets in a given room the same. Key each room differently. Provide six master keys capable of unlocking any of the locks provided in any room. Locks must be capable of locking upward, downward, in the three o'clock position and in the nine o'clock position depending on actual conditions.
   1. Locks shall be National, Timberline or approved equal.
   2. Keying that are 5 pin tumbler cores.

E. Drawer Slides:
   1. Type: Standard extension.BHMA No. B05052
   2. Static Load Capacity: Commercial grade (75#) at all drawers except use extra heavy duty(100#) at file drawers under 24 inches wide. Use extra heavy duty 150 # at file drawers 24 inches to 30 inches wide. Use extra heavy duty 200 # for drawers 30 inches and wider.
   3. Mounting: Side mounted.
   4. Stops: Integral type.

F. Hinges: European style concealed self-closing type, 110 degree opening, BHMA No. B01602, steel with satin finish.

G. Coat and Bag Hooks: Satin chrome steel or satin nickel.
   1. One double prong coat hook and one single prong bag hook in each cubby in classrooms.
   2. Single prong bag hooks as shown on drawings in Buddy Pack Room No. 502.

2.09 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
   1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
   2. Cap exposed plastic laminate finish edges with material of same finish and pattern.

E. Mechanically fasten back splash to countertops as recommended by laminate manufacturer at 16 inches on center.

F. Provide cutouts for plumbing fixtures, outlet boxes, and similar items. Verify locations of cutouts from on-site dimensions. Seal cut edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

A. General: Install work in accordance with AWI//AWMAC/WI Architectural Woodwork Standards Section 400, Architectural Cabinets, for Custom Grade.

B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

C. Use fixture attachments in concealed locations for wall mounted components.

D. Use concealed joint fasteners to align and secure adjoining cabinet units and countertops.

E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.

F. Secure cabinets to floor using appropriate angles and anchorages.

3.03 ADJUSTING

A. Adjust installed work.

B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

SECTION 07 92 00
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Joint backings and accessories.

1.02 SUBMITTALS

A. See Division One for submittal procedures.

B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.
   5. Substrates for which use of primer is required.
   6. Substrates for which laboratory adhesion and/or compatibility testing is required.
   7. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
   8. Sample product warranty.
   9. Certification by manufacturer indicating that product complies with specification requirements.

C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

1.03 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.

1.04 MOCK-UP

A. Provide mock-up of sealant joints under provisions of Section 01 40 00, Quality Requirements. Coordinate with Section 04 01 00, Maintenance of Masonry.

B. For silicone sealant joints, meet on-site with manufacturer's designated representative prior to and during installation of mock-up. Install as directed by manufacturer's designated representative. Coordinate further on-site meetings with manufacturer's designated representative as required for proper and complete installation of product, and as required to fulfill manufacturer's warranty requirements.

C. Construct mock-up with specified sealant types and with other components noted.

D. Locate where directed.

E. Mock-up may remain as part of the Work.

1.05 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Silicone Sealants: Correct defective work within a twenty year period after Date of Substantial Completion.

C. Butyl Sealants: Correct defective work within a two year period after Date of Substantial Completion.

D. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.
   1. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
   2. Dow Corning Corporation: www.dowcorning.com/construction/#sle.
   3. Pecora Corporation: www.pecora.com.
   4. Sika Corporation: www.usa-sika.com/#sle.
   5. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
   6. ADFAST Corporation; www.adfastcorp.com/en.
   7. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 NONSAG JOINT SEALANTS

A. Type E-1 - General Purpose Exterior Sealant: Silicone Sealant: ASTM C920, Grade NS, Uses NT, M, G, A, O; single or multi-component, non-sagging, neutral-curing.
   1. Non-Staining to Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
   2. Color: To be selected by Architect from manufacturer's standard range.
   3. Applications: Use for:
      a. Control joints and other sealant joints in masonry and stone work.
      b. Sealant joints at exterior perimeters of doors, windows, louvers, pipes, and other penetrations of exterior walls.
      c. Exterior building sealant joints for which no other sealant is specified.
   4. Manufacturers:
      a. ADFAST Corporation; ADSEAL DWS 4580 Series: www.adfastcorp.com/en.
      b. Dow Corning Corporation; 790 Silicone Building Sealant: www.dowcorning.com/construction.
      c. Tremco Commercial Sealants & Waterproofing; Spectrem 2: www.tremcosealants.com.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Type E-2 - Butyl Sealant: ASTM C920, Grade NS, Class 12-1/2, Uses NT, M, G, A, O; single component, solvent release, non-skinning, non-sagging.
   1. Color: To be selected by Architect from manufacturer's standard range.
   2. Applications: Use for:
      a. Concealed sealant bead in sheet metal work.

C. Type E-3 - Concrete Paving Joint, Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Class 25, Uses T, I, M, A, O; multi- component, chemical curing, non staining, non bleeding, self-leveling type.
   1. Color: Color as selected.
   2. Applications: Use for:
      a. Joints in sidewalks and vehicular paving.

D. Type I-1 - General Purpose Interior Sealant, Acrylic Emulsion Latex: ASTM C834, Type OP, Grade NF, single component, non-staining, non-bleeding, non-sagging, capable of being painted.

1. Color: To be selected by Architect from manufacturer's standard range.
2. Applications: Use for:
    a. Interior wall and ceiling control joints.
    b. Interior joints between door and window frames and wall surfaces.
    c. Other interior joints for which no other type of sealant is indicated.

E. Type I-2 - Bathroom/Tile Sealant: Silicone; ASTM C920, Uses I, M and A; single component, mildew resistant.
1. Applications: Use for:
    a. Joints between plumbing fixtures and floor and wall surfaces.
    b. Joints between kitchen and bathroom countertops and wall surfaces.

F. Type G-1 - Silicone Sealant: ASTM C920, Grade NS, Class 25, Uses NT, A, G, M, O; single component, solvent curing, non-sagging, non-staining, fungus resistant, non-bleeding.
1. Color: To be selected by Architect from manufacturer's standard range.
2. Movement Capability: Plus and minus 25 percent.
3. Service Temperature Range: -65 to 180 degrees F.
4. Shore A Hardness Range: 15 to 35.
5. Applications: Use for:
    a. All glazing operations.

2.03 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.
2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
3. Open Cell: 40 to 50 percent larger in diameter than joint width.
4. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

F. Fine, smooth, clean, silica sand for sanded sealant joints.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints and substrates are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable. Protect all elements surrounding the work of this section from damage or disfigurement.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

D. Install bond breaker backing tape where backer rod cannot be used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

H. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

I. Sand all sealant joints in brick and stone work using fine, smooth, clean silica sand "thrown" or "dusted" into sealant after it has been tooled and is still "tacky".

3.04 TESTING AND INSPECTION

A. The Owner may hire an independent testing agency to cut out and remove installed sealant joints in six (6) locations per each side of building, each approximately one (1) linear foot. Locations will be randomly selected by the testing agency or Architect. The work will be checked by the testing agency for compliance with the contract documents in accordance with ASTM C1193. If defective work is found in any of the test locations, additional tests may be required of the Contractor at no additional cost to the Owner. If any test section removed reveals non-complying work, remove all adjacent sealant work to the point where work is found to be in compliance. Re-seal in accordance with the contract documents. If all tests fail to meet the contract document requirements, the Contractor shall be required to re-seal the entire section of the building at no additional cost to the Owner. Provide lifts or other acceptable means of access to the work.

3.05 CLEANING

A. Clean adjacent soiled surfaces.

3.06 PROTECTION

A. Protect sealants until cured.

3.07 POST-SUBSTANTIAL COMPLETION INSPECTION

A. Post-Substantial Completion Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width; i.e. at the low temperature in the thermal cycle. Report failures immediately and repair.

3.07 SCHEDULE

A. See Drawings for designated sealant joints.

B. Exterior Joints for Which No Other Sealant Type is Indicated: Type E-1.

C. Control and Expansion Joints in Paving: Type E-3.

D. Exterior Wall Expansion Joints: Type E-1.

E. Joints Between Concrete Panels and Between Panels and Adjacent Work: Type E-1.

F. Control, Expansion, and Soft Joints in Masonry, and Between Masonry and Adjacent Work: Type E-1.

G. Lap Joints in Exterior Sheet Metal Work: Type E-2.

H. Joints Between Exterior Metal Frames and Adjacent Work: Type E-1.

I. Under Exterior Door Thresholds: Type E-1.

J. Interior Joints for Which No Other Sealant is Indicated: Type I-1;.

K. Control and Expansion Joints in Interior Concrete Slabs and Floors: Type E-3.

L. Joints Between Plumbing Fixtures and Walls and Floors, and Between Countertops and Walls: Type I-2.

M. All Glazing Joints: Type G-1.

END OF SECTION

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SECTION 08 11 13
HOLLOW METAL FRAMES AND DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Steel door frames.

B. Steel glazing frames.

C. Storm Rated Doors and Frames.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.

D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

E. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Maintain at the project site a copy of all reference standards dealing with installation.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store in accordance with NAAMM HMMA 840.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Frames:
   1. Assa Abloy Ceco or Curries: www.assaabloydss.com.
   2. Republic Doors: www.republicdoor.com.
   3. Steelcraft, an Ingersoll Rand brand: www.steelcraft.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FRAMES

A. Requirements for all Frames:
   1. Accessibility: Comply with ANSI/ICC A117.1.
   2. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in Section 08 16 13 FRP Flush Doors.
   3. Galvanizing for Units in Wet Areas, including exterior frames: All components hot-dipped zinc-iron alloy-coated (galvannealed), manufacturer's standard coating thickness.
   4. Finish: Factory primed, for field finishing.

B. Combined Requirements: If a particular FRP door and steel frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type. Where two requirements conflict, comply with the most stringent.

2.03 STORM DOORS

A. Storm Doors: see Door Schedule.
   1. CECO StormPro System: Door and Frame.
      a. 1-3/4" Thickness
      b. 16 GA. Face Sheets with 12 GA. Liner and 14 GA. Welded Top and Bottom Channels.
      c. Prep door and frame for multi-point locking hardware-See Section 08 71 00 Door Hardware for hardware information.
      d. Comply with manufacturer's requirements for frame anchoring.

2.04 STEEL FRAMES

A. General:All frames: Comply with ANSI A250.8 for Level 1, 16 gage.
   1. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
   2. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.
   3. Frames Wider than 48 Inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

B. Exterior Door Frames and Door Frames in wet areas where shown on drawings: Fully welded.
   1. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A60/ZF180 coating.
   2. Finish: Completely factory finished.
   3. Weatherstripping: Separate, see Section 08 71 00.
   4. Color: Shown in finish schedule on drawings.

C. Interior Door Frames, Non-Fire-Rated: Face welded type.
   1. Finish: Completely factory finished.
   2. Color: Shown in finish schedule on drawings.

D. Storm Door Frames: Doors see Door Schedule.
   1. CECO StormPro System: Door and Frame.
      a. 14 GA. Fully Welded.
      b. Prep door and frame for multi-point locking hardware-See Section 08 71 00 Door Hardware for hardware information.
      c. Mount frame in masonry or concrete opening.

E. Frames for Interior Glazing or Borrowed Lights: Construction and face dimensions to match door frames, and as indicated on drawings.

2.05 ACCESSORY MATERIALS

A. Glazing: As specified in Section 08 80 00.

B. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.

C. Removable Mullions: Specified in Section 08 71 00, Door Hardware.

D. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.

E. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.

F. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

2.06 FINISH MATERIALS

A. Primer: Rust-inhibiting, complying with ANSI A250.10 frame manufacturers standard.

B. Factory Finish: Complying with ANSI A 250.3, manufacturer's standard coating.

C. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

A. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.

B. In addition, install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

E. Coordinate installation of hardware.

F. Coordinate installation of glazing.

G. Coordinate installation of electrical connections to electrical hardware items.

H. Touch up damaged factory finishes.

3.04 TOLERANCES

A. Clearances Between Door and Frame: As specified in ANSI A250.8.

B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

3.06 SCHEDULE - SEE DRAWINGS

END OF SECTION

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SECTION 08 14 16
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors; flush configuration; non-rated.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
   1. Provide the information required by AWI/AWMAC/WI Architectural Woodwork Standards.

D. Specimen warranty.

E. Samples: Submit two samples of door veneer, 12 by 12 inch in size illustrating wood grain, stain color, and sheen.

F. Manufacturer's Installation Instructions: Indicate special installation instructions.

G. Warranty, executed in Owner's name.

1.03 QUALITY ASSURANCE

A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging. Inspect for damage.

C. Protect doors with resilient packaging. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges if stored more than one week. Break seal on site to permit ventilation.

1.05 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Interior Doors: Provide manufacturer's warranty for the life of the installation.

C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Veneer Faced Doors:
   1. Eggers Industries: www.eggersindustries.com.
   2. Haley Brothers: www.haleybros.com.
   3. Marshfield Door Systems, Inc: www.marshfielddoors.com.
   4. Basis of Design: VT Industries; Product Heritage.
   5. Graham Doors.
   6. Oshkosh Door Co.
   7. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DOORS AND PANELS

A. All Doors: See drawings for locations and additional requirements.

1. Quality Level: Custom Grade, Extra Heavy Duty performance, in accordance with WDMA I.S.1-A.
2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
1. Provide solid core doors at all locations.
2. Wood veneer facing with factory transparent finish.

2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated above.

2.04 DOOR FACINGS

A. Wood Veneer Facing for Transparent Finish: Red oak, veneer grade as specified by quality standard, plain sliced, book veneer match, running assembly match.

2.05 ACCESSORIES

A. Glazing Stops: Wood, of same species as door facing, mitered corners; prepared for countersink style tamper proof screws.

2.06 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:

C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
1. Exception: Doors to be field finished.

E. Provide edge clearances in accordance with the quality standard specified.

2.07 FACTORY FINISHING - WOOD VENEER DOORS

A. Finish work in accordance with WDMA I.S.1A Standard Wood Door Finishing System Ratings as follows:
1. Transparent:
a. Catalyzed Polyurethane TR-6.
b. Stain: As selected by Architect from manufacturers standard full range of colors.
c. Sheen: Satin.

B. Factory finish doors in accordance with approved sample.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Use machine tools to cut or drill for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

E. Coordinate installation of glazing.

3.03 TOLERANCES

A. Conform to specified quality standard for fit and clearance tolerances.

B. Conform to specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

END OF SECTION

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SECTION 08 32 50

BULLET-RESISTANT SECURITY ALUMINUM WINDOWS, DOORS AND FRAMES

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes interior aluminum framed bullet resistant doors, frames, and openings.

1.02 SYSTEM PERFORMANCE REQUIREMENTS

A. Ballistics-Resistance Performance: Provide units identical to those tested for compliance with requirements indicated, and are Listed and labeled as bullet resisting according to UL 752, ***Level 4 bullet resistance.***

B. Forced-Entry-Resistance Performance: Provide units identical to those tested for forced-entry resistance according to HPW-TP-0500.03 or ASTM F 1233 by a testing agency acceptable to authorities having jurisdiction.

C. Design: Frames shall be of the "non-ricochet type" design that is intended to permit the encapture and retention of an attacking projectile lessening the potential of a random injury or lateral penetration. The encapturing barrier shall be UL-listed bullet resistant composite. Frames must utilize a UL-listed internal ballistic protection barrier.

D. Glazing details shall permit glass replacement after initial construction, shall permit use/reuse of original gaskets, shall permit replacement glass of the same nominal size as original glass, and shall not require cutting of framing members or removal of interior finishes. Vision glass in conventional frames shall be replaceable from the interior.

E. Interior window sill trim shall not deflect more than 0.125 inch when subjected to a concentrated force of 25 pounds at any point. Residual deflection after removal of force shall not exceed 0.062 inch.

F. Snap engaged components shall not disengage when subjected to a concentrated force of 10 pounds at any point or during uniform pressure structural tests at pressures less than or equal to 1.5 times design pressures. Snap engaged components shall be secured against migration. Snap engaged components shall not serve any primary structural function, such as retention of glass or panels. Snap engaged plastic components are not permitted, except as nonstructural thermal improvement for interior trim. Joints in continuous snap covers and other continuous trim shall have splice sleeves of the same material and finish as the cover or trim.

G. Provide completely prefabricated, assembled and shop glazed unitized components to the field for shortest possible field erection time.

1.03 SUBMITTALS

A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.

B. Product data for each bullet resistant product indicated, including data on finishes, hardware, accessories, and maintenance recommendations.

C. Shop Drawings for each bullet resistant product indicated, including:

D. Layout and installation details, including relationship to adjacent work.

E. Elevations at 1/4 inch scale.

F. Detail sections of typical composite members.

G. Anchors and reinforcements. Hardware mounting heights. Provisions for expansion and contraction. Glazing details.

H. Hardware Schedule: Submit complete hardware schedule organized into sets based on hardware specified in Division 8 Sections. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function, and finish. Include item name, name of the manufacturer and complete designations of every item for each door opening.

I. Test Reports: Provide certified test reports from a qualified independent testing laboratory showing that bullet resistant aluminum doors and frames have been tested in accordance with specified test procedures and comply with performance characteristics indicated.

1.04 QUALITY ASSURANCE

A. INSTALLER QUALIFICATIONS: ENGAGE AN EXPERIENCED INSTALLER WHO HAS COMPLETED INSTALLATIONS OF BULLET RESISTANT ALUMINUM DOORS AND FRAMES SIMILAR IN DESIGN AND EXTENT TO THOSE REQUIRED FOR THE PROJECT AND WHOSE WORK HAS RESULTED IN CONSTRUCTION WITH A RECORD OF SUCCESSFUL IN-SERVICE PERFORMANCE.

B. FABRICATOR QUALIFICATIONS: PROVIDE BULLET RESISTANT DOORS AND FRAMES FABRICATED BY A FIRM EXPERIENCED IN PRODUCING SYSTEMS THAT ARE SIMILAR TO THOSE INDICATED FOR THIS PROJECT, AND THAT HAVE A RECORD OF SUCCESSFUL IN-SERVICE PERFORMANCE. THE FABRICATOR SHALL HAVE SUFFICIENT PRODUCTION CAPACITY TO PRODUCE COMPONENTS REQUIRED WITHOUT CAUSING DELAY IN PROGRESS OF THE WORK.

C. SINGLE SOURCE RESPONSIBILITY: OBTAIN BULLET RESISTANT ALUMINUM DOORS AND FRAMES FROM ONE SOURCE AND FROM A SINGLE MANUFACTURER.

D. TESTING AGENCY QUALIFICATIONS: QUALIFIED ACCORDING TO ASTM E 699 AND EXPERIENCED IN BALLISTICS AND FORCED-ENTRY RESISTANCE TESTING.

E. WELDING QUALIFICATIONS: QUALIFY PROCEDURES AND PERSONNEL ACCORDING TO THE FOLLOWING:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   2. AWS D1.3, "Structural Welding Code - Sheet Steel."
   3. AWS D1.6, "Structural Welding Code - Stainless Steel."

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver bullet resistant aluminum doors and frames in the manufacturer's original protective packaging.

B. Store bullet resistant aluminum components in a clean, dry location away from uncured masonry or concrete. Cover components with waterproof paper, tarpaulin, or polyethylene sheeting in a manner to permit circulation of air.

C. Stack framing components in a manner that will prevent bending and avoid significant or permanent damage.

1.06 PROJECT CONDITIONS

A. Field Measurements: Check openings by accurate field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of the work.

B. Where necessary, proceed with fabrication without field measurements and coordinate fabrication tolerances to ensure proper fit.

1.07 WARRANTY

A. WARRANTY: SUBMIT A WRITTEN WARRANTY, EXECUTED BY THE MANUFACTURER, AGREEING TO REPAIR OR REPLACE UNITS THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN THE SPECIFIED WARRANTY PERIOD. FAILURES INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO: STRUCTURAL FAILURES INCLUDING EXCESSIVE DEFLECTION, EXCESSIVE LEAKAGE OR AIR INFILTRATION.
   1. Faulty operation.
   2. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

B. Warranty Period: Three (3) years after the date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Insulgard Security Products;www.insulgard.com.

1. Bullet Resistant Door Frame: TH600 Framing System.
2. Bullet Resistant Door: HP 500 Door System with Tor-Gard 40 glazing.

B. Approved equal per requirements of Division 1 Section 01 60 00.

2.02 MATERIALS

A. Aluminum Members: All aluminum extrusions shall be extruded from 6063-T6 alloy or equal with aluminum tensile strength (minimum 35.0 ksi ultimate, 32.0 ksi yield).

B. Carbon Steel reinforcement of aluminum framing members shall comply with ASTM A 36 for structural shapes, plates and bars, ASTM A 611 for cold rolled sheet and strip, or ASTM A 570 for hot rolled sheet and strip.

C. SETTING BLOCKS: SETTING BLOCKS SHALL BE DENSE EXTRUDED SILICONE OR EPDM WITH A HARDNESS OF 85 +/- 5 DUROMETER SHORE A, A MINIMUM LENGTH OF 4 INCHES, AND A MINIMUM WIDTH CORRESPONDING TO THE GLASS THICKNESS. SETTING BLOCKS SHALL BE EQUIDISTANT FROM THE GLASS CENTERLINE. LOCATION OF SETTING BLOCKS AT GLASS QUARTER POINTS IS ACCEPTABLE. THE DISTANCE FROM THE VERTICAL GLASS EDGE TO THE NEAREST EDGE OF THE SETTING BLOCK SHALL NOT BE LESS THAN SIX INCHES OR 0.125 TIMES GLASS WIDTH, WHICHEVER IS GREATER.

D. Shims used in conjunction with setting blocks shall be of the same material, hardness, length and width as the setting blocks.

E. Setting blocks and chairs shall be secured against migration.

F. Silicone setting blocks are required where structural silicone occurs at the sill.

G. Side Blocks: Provide two side blocks minimum at both jambs at approximately the quarter points of the glass edge. Blocks shall be a 55 +/- 5 durometer Shore A dense silicone or EPDM. Install block with 0.125 inch (3.2 mm) clearance between block and bearing surface. Positively secure blocks in position. Side blocks may be omitted where glass is secured with structural silicone.

H. Anchors in Concrete: Anchors embedded in concrete shall be prime painted or hot dip galvanized rolled steel, or hot dip galvanized cold formed steel, with integral projections or welded deformed bars or headed studs. Provide expansion bolts in concrete. Self drilling, self threading screws are not acceptable. Screws in plugs and power actuated fasteners are not acceptable.

I. Fasteners: Fastener requirements listed below are applicable to screws, bolts, nuts, washers, rivets, and pins.
   1. Fasteners in contact with stone shall be stainless steel type 302 or 304.
   2. Fasteners outboard of or within a glazing pocket, finished cavity or other potentially wet location (after completion of construction) shall be stainless steel type 302 or 304. Fasteners inboard of potentially wet locations shall be stainless steel type 302 or 304, cadmium plated carbon steel or zinc plated carbon steel.
   3. Provide lock washer or other locking device at all bolted connections.
   4. Powder actuated fasteners are not acceptable.
   5. Where fasteners screw-anchor into aluminum members less than 0.125 inches thick, reinforce the interior with nonmagnetic stainless steel to receive screw threads. Do not use exposed fasteners except for application of hardware. For application of hardware, use Phillips flat head machine screws that match the finish of member or hardware being fastened.

J. Shims:
   1. At connections subject to movement, separate all pairs of moving surfaces with friction reducing pads. Pads shall have minimum 0.125 inch thickness and shall be positively retained in position (open ended slots are not acceptable). Shims which transfer shear forces (tending to slide one shim against another) shall be steel plates, set in a staggered pattern and fillet welded to each other and to the adjacent steel surfaces. The shims and welds shall be structurally designed to support the applied loads. Plastic shims are acceptable at static connections for which the shims transfer only compressive forces. Wood shims are not acceptable.

K. Sealants: Acceptable products for nonstructural seals to substrates other than stone are:
   1. General Electric Sillpruf

2. Dow Corning 790 and 795
3. Tremco Spectrem 1 and 2

L. Acceptable products for structural seals are: Dow Corning 795 and 983; Tremco Proglaze II; GENERAL ELECTRIC SSG 4000 AND SSG 4200.

M. Products requiring mixing of components are acceptable only for shop application with mixing and applicating.
1. Oil base sealants are not acceptable. Sealant Requirements: Comply with the printed instructions and recommendations of the sealant manufacturer regarding joint size limitations, mixing, priming, and application. Unless printed instructions advise to the contrary, do not apply sealants when substrates are wet or when the temperature is below 40 degrees F (4 degrees C).
2. Sealant backup materials shall be polyethylene foam, urethane foam or extruded silicone as recommended by sealant manufacturer. All sealant shall be tooled as a separate operation after application.
3. Coordinate with other sections to assure compatibility of intersecting sealants. Brackets and Reinforcements: Provide high strength nonmagnetic stainless steel brackets or hot-dip galvanized steel complying with ASTM A 123.

N. Concrete and Masonry Inserts: All internal fasteners shall be 300 Series stainless steel. Framing to building structure shall be grade 5, cadmium or nickel plated. Interior glazing gaskets shall be solid santoprene or EPDM (65-75 Shore A durometer). Exterior glazing gaskets shall be solid santoprene or EPDM (45-65 Shore A durometer).

2.03 HARDWARE

A. Refer to Division 8 Section "Door Hardware" for requirements for hardware items other than indicated to be provided by the bullet resistant aluminum door and frame manufacturer. Provide heavy duty hardware units as indicated, scheduled, or required for operation of each door as specified. Provide positive dead stop at the opening angle standard with the manufacturer for the hold-open angle selected. Provide floor mounted door stop, as specified, with integral rubber bumper; comply with ANSI A156.16, Grade 1.

2.04 COMPONENTS

A. Window, Door and Framing System: Provide system fabricated from extruded aluminum members of 2" x 6" minimum profile indicated. Include subframes and other reinforcing members of the type indicated. Shop fabricate and preassemble frame components.

B. Mullion Configurations: Provide pockets at the inside glazing face to receive specified glazing gaskets. Mullions and horizontals shall be preassembled into preglazed units. Make provisions to drain moisture accumulation to the exterior.

C. Provide security entrance door frame assemblies, as indicated, with welded or mechanical joints in accordance with manufacturer's standards. Reinforce as necessary to support required loads.

D. Glass Type: Insulgard Security Products Tor-Gard 40. Level 4 Resistance. Provide hook-in extruded interior aluminum glazing stops, with exterior flanges anchored nonremovable.

E. Lights: Provide bullet resistant glazing openings as indicated, with specified moldings and stops. Provide nonremovable stops on the exterior.

2.05 FABRICATION

A. General: Fabricate security aluminum door and frame components to designs, sizes and thicknesses indicated and to comply with indicated standards. Sizes and profile requirements are indicated on the drawings. Variable dimensions are indicated with maximum and minimum dimensions required to achieve design requirements and coordination with other work.

B. Prefabrication: Complete fabrication, assembly, finishing, hardware application, and other work to the greatest extent possible before shipment to the project site. Disassemble components only as necessary for shipment and installation. Typical fixed modules shall be completely prefabricated, shop assembled and shop glazed.

C. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work to prevent damage to exposed finish surfaces. Complete these operations for hardware prior to application of finishes. Preassemble framing into prefabricated units and shop glaze insofar as practicable.

D. Preglaze door and frame units to greatest extent possible. Typical fixed modules shall be shop glazed.

E. Welding: Comply with AWS recommendations. Grind exposed welds smooth to remove weld spatter and welding oxides. Restore mechanical finish. Welding behind finished surfaces shall be performed in such a manner as to minimize distortion and discoloration on the finished surface.

F. Reinforcing: Install reinforcing as required for hardware and as necessary for performance requirements, sag resistance and rigidity.

G. Dissimilar Metals: Separate dissimilar metals with bituminous paint, or a suitable sealant, or a nonabsorptive plastic or elastomeric tape, or a gasket between the surfaces. Do no use coatings containing lead.

H. Continuity: Maintain accurate relation of planes and angles with hairline fit of contacting members.

I. Uniformity of Metal Finish: Abutting extruded aluminum members shall not have an integral color or texture variation greater than half the range indicated in the sample pair submitted.

J. Fasteners: Conceal fasteners wherever possible. Exposed fasteners shall not be allowed at typical frame conditions.

2.06 ANODIZED ALUMINUM FINISH

A. Anodized finish shall be Aluminum Association Architectural Class II, clear coating, 0.010 mm or thicker, complying with AAMA 607.

B. Color to match existing. HHS appears to be clear anodized and RBHS dark bronze. Contractor to confirm prior to shop drawings and fabrication.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and supports, with the installer present, for compliance with requirements indicated, installation tolerances, and other conditions that affect installation of aluminum entrances and storefronts. Correct unsatisfactory conditions before proceeding with the installation. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Comply with manufacturer's instructions and recommendations for installation. Set units plumb, level, and true to line, without warp or rack of framing members, doors, or panels. Install components in proper alignment and relation to established lines and grades indicated. Provide proper support and anchor securely in place. Construction Tolerances: Install security aluminum doors and frames to comply with the following tolerances:

1. Variation from Plane: Do not exceed 1/8 inch in 12 feet of length or 1/4 inch in any total length. Offset from Alignment: The maximum offset from true alignment between two identical members abutting end to end in line shall not exceed 1/16 inch.
2. Diagonal Measurements: The maximum difference in diagonal measurements shall not exceed 1/8 inch. Offset at Corners: The maximum out-of-plane offset of framing at corners shall not exceed 1/32 inch. Separate aluminum and other corrodible metal surfaces from sources of corrosion or electrolytic action at points of contact with other materials. Zinc or cadmium plate steel anchors and other unexposed fasteners after fabrication. Paint dissimilar metals where drainage from them passes over aluminum. Paint aluminum surfaces in contact with mortar, concrete or other masonry with alkali resistant coating. Paint wood and similar absorptive material in contact with aluminum and exposed to the elements or otherwise subject to wetting, with two coats of aluminum house paint. Seal joints between the materials with sealant.

B. Drill and tap frames and doors and apply surface mounted hardware items. Comply with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible.

Set sill members and other members in bed of sealant as indicated, or with joint fillers or gaskets as indicated to provide weathertight construction.

3.03 ADJUSTING

A. ADJUST OPERATING HARDWARE TO FUNCTION PROPERLY, FOR SMOOTH OPERATION WITHOUT BINDING, AND FOR WEATHERTIGHT CLOSURE.

3.04 CLEANING

A. Clean the completed system, inside and out, promptly after installation, exercising care to avoid damage to coatings. Clean glass surfaces after installation. Remove excess glazing and sealant compounds, dirt and other substances from aluminum surfaces.

3.05 PROTECTION

A. Institute protective measures required thoughout the remainder of the construction period to ensure that aluminum security doors and frames will be without damage or deterioration, other than normal weathering, at time of acceptance.

END OF SECTION

SECTION 08 43 13
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront system.

B. Perimeter sealant specified in Section 07 90 05, Joint Sealers.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass, internal drainage details.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

D. Design Data: Provide framing member structural and physical characteristics, engineering calculations, dimensional limitations.

E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

F. Report of field testing for water leakage.

G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the State in which the Project is located.

B. Manufacturer and Installer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.06 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN -- FRAMING

A. Exterior- Center-Set Style, Thermally-Broken:
   1. Basis of Design Exterior: EFCO Corporation; Series 403, Thermal Storefront Framing.
   2. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.

B. Interior- Center Set Style, Non- Thermally Broken
   1. Basis of Design Exterior: EFCO Corporation; Series 401, Storefront Framing.
   2. Vertical Mullion Dimensions: 1-3/4 inches wide by 4-1/2 inches deep.

C. Other Manufacturers:
   1. YKK AP America Inc: www.ykkap.com.
   2. Oldcastle Building envelope Products; www.oldcastlebe.com.
   3. Manko Window Systems Inc.; www.mankowindows.com.
   4. Kawneer 450/451T Series.

D. Substitution Procedures: See Section 01 60 00 - Product Requirements.
   1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.02 STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Finish: Anodic, Class I. See drawings for color choice.
      a. Factory finish all surfaces that will be exposed in completed assemblies.
      b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
      c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
   2. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   3. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
   4. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
   5. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
   6. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
   7. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

B. Performance Requirements:
   1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
      a. Design Wind Loads: Comply with requirements of IBC code in affect.
      b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
   2. Water Penetration Resistance: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8.00 lbf/sq ft.
   3. Air Leakage: Maximum of 0.06 cu ft/min/sq ft of wall area, when tested in accordance with ASTM E283 at 6.27 pounds per square foot pressure differential across assembly.

4. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
5. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at specified differential pressure across assembly in accordance with ASTM E283.
6. Condensation Resistance Factor: Measure in accordance with AAMA 1503 with 1 inch insulating glass installed.
7. Water Leakage: None, when measured in accordance with ASTM E331 at specified pressure differential.
8. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
9. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.
10. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
11. Overall U-Value, Including Glazing: 0.38 maximum fixed and 0.45 maximum operable.
12. Overall Solar Heat Gain Coefficient: 0.24 maximum.

2.03 COMPONENTS

A. Sun Shades: EFCO E-Shade Sun Shades or equal.
   1. 4 inch deep blades.
   2. All components made from same material as storefront framing and finish.

2.03 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).
B. Sheet Aluminum: ASTM B209 (ASTM B209M).
C. Fasteners: Stainless steel.
D. Exposed Flashings: 0.032 inch thick aluminum sheet; finish to match framing members.
E. Perimeter Sealant: specified in Section 07 90 05, Joint Sealers.
F. Glass: As specified in Section 08 80 00.
G. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
H. Glazing Accessories: As specified in Section 08 80 00.

2.05 FINISHES

A. Anodic Finish, Class I, AAMA 611-98. See drawings for color choice.

2.06 FABRICATION

A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
B. Accurately fit and secure joints and corners. Make all joints flush, hairline, and weatherproof.
C. Prepare components to receive anchor devices. Fabricate anchors.
D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
E. Arrange fasteners and attachments to conceal from view.
F. Reinforce framing members for imposed loads.
G. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Coordinate attachment and seal of perimeter air and vapor barrier materials.

I. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

J. Install glass in accordance with Section 08 80 00, using glazing method required to achieve performance criteria.

K. Install perimeter sealant in accordance with Section 07 90 05.

L. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for independent testing and inspection requirements. Inspection will monitor quality of installation and glazing.

B. Test installed storefront for water leakage in accordance with AAMA 501.2.

3.05 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

3.06 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

C. Remove excess sealant by method acceptable to sealant manufacturer.

3.07 PROTECTION

A. Protect installed products from damage during subsequent construction.

END OF SECTION

SECTION 08 71 00
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hardware for doors.

B. Electrically operated and controlled hardware.

C. Lock cylinders for doors for which hardware is specified in other sections.

D. Thresholds.

E. Weatherstripping and seals.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products onto which door hardware will be installed.

B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.

C. Convey Owner's keying requirements to manufacturers.

D. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; require attendance by all affected installers.

E. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project.

C. Shop Drawings:
   1. Indicate locations and mounting heights of each type of hardware, schedules, catalog cuts, electrical characteristics and connection requirements.

D. Hardware Schedule: Detailed listing of each item of hardware to be installed on each door. Use door numbering scheme as included in the Contract Documents. Identify electrically operated items and include power requirements.

E. Keying Schedule: Submit for approval of Owner.

F. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

G. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.

H. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
   1. Submit manufacturer's parts lists and templates.

I. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

J. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Tools: One set of all special wrenches or tools applicable to each different or special hardware component, whether supplied by the hardware component manufacturer or not.

1.04 QUALITY ASSURANCE

A. Standards for Fire-Rated Doors: Maintain one copy of each referenced standard on site, for use by Architect and Contractor.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

C. Hardware Supplier Qualifications: Company specializing in supplying commercial door hardware with three years of experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

1.06 COORDINATION

A. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware.

B. Furnish templates for door and frame preparation.

C. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

D. Coordinate Owner's keying requirements during the course of the Work.

E. Coordinate work of others that directly affects this section.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide five year warranty for all door hardware.

1.08 MAINTENANCE PRODUCTS

A. Provide special wrenches and tools applicable to each different or special hardware component.

B. Provide maintenance tools and accessories supplied by hardware component manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS - BASIS OF DESIGN

A. Hinges:
   1. Hager Companies: www.hagerhinge.com unless noted otherwise.
      a. Type 1: BB 1199 4.5" x 4.5" by Hager.
      b. Type 2: Continuous Hinges: Hager-Roton 780 HD Series.
      c. Type 3: 5BB1 HW NRP 4.5"x4.5" 630 by Ives.
      d. Type 4: 5BB1 HWTW TW8CON 4.5"x4.5" 630 by Ives. Include one Von Duprin CON-192 wiring harness with each hinge.

B. Locksets:
   1. Type 1: Lever Handle: Schlage ND Series Cylindrical Lockset, Rhodes handle style.
   2. Type 2: Push/Pull:
      a. Push: Model 82, Stainless Steel finish. Rockwood: www.rockwoodmfg.com.
      b. Pull: Model 157, Stainless Steel finish, concealed heavy duty fasteners. Rockwood: www.rockwoodmfg.com.

C. Cylinders:
   1. All lock hardware shall be Schlage Everest "D" restricted keyway- no substitutes (interchangeable and standard cores). Exception: Schlage "C" standard keyway on classrooms interior side of intruder safety security locksets.
   2. Exterior side, of all exterior doors, locks for all district buildings shall be the Schlage Everest "D" restricted keyway (D-124) in the large format interchangeable cores.

3. Interior side, of all exterior doors, locks, panic devices and removable mullions for CPS buildings shall be the Schlage Everest "D" restricted keyway in the large format interchangeable cores. NOTE:(D-125) for all elementary schools, (D-123) for all middle schools, high schools and administrative buildings.
4. Fire doors with RIM cylinders for CPS buildings shall be the Schlage Everest "D" restricted keyway in the large format interchangeable cores. NOTE:(D-125) for all elementary schools, (D-123) for all middle schools, high schools and administrative buildings.
5. Interior door locksets for CPS buildings shall be on the Schlage Everest "D" restricted keyway, standard core. NOTE:(D-125) for all elementary schools, (D-123) for all middle schools, high schools and administrative buildings.
6. It is the intention of the school district to have only one exterior lockset at each building entry, regardless of the number of doors at an individual location. CPS will direct which will be the active door w/keyway.
7. Notify the Director of Building Services if the specified hardware does not comply with this requirement.

D. Deadbolts:
   1. Schlage B Series with interchangeable core.

E. Flushbolts:
   1. Flushbolts: Lever extension bolts in leading edge of door, one bolt into floor, one bolt into top of frame unless noted otherwise.
   2. Manufacturers - Flushbolts:
      a. Assa Abloy McKinney: www.assaabloydss.com.
      b. Hager Companies: www.hagerco.com.
      c. Ives: www.ives.ingersollrand.com.

F. Strike:
   1. Type 1: Standard Strike.
   2. Type 2: Electric Strike.
      a. Security Door Controls (SDC): 15 Series Electric Strike. Coordinate electrical requirements with auto door operator and user security access system.

G. Exit Devices:
   1. Precision unless noted otherwise.
      a. Type 1 (Rim panic device with exterior key x pull handle x keyed cylinder dogging):
         1) Panic: Precision Apex 2103CD and ELR2103CD when applicable.
         2) Exterior Handle: Rockwood BF 157 pull handle.
         3) Cylinders: Two (2) Schlage cylinders as defined in 1.09 Owner Hardware Requirements above.
         4) Panic bar shall be keyed cylinder dogging not hex dogging.
      b. Type 2 (Rim panic device without exterior key x pull handle x cylinder dogging):
         1) Panic: Precision Apex 2103CD and ELR2103CD when applicable.
         2) Exterior Handle: Rockwood BF 157 pull handle.
         3) Cylinders: One (1) Schlage cylinder as defined in 1.09 Owner Hardware Requirements above.
         4) Panic bar shall be keyed cylinder dogging not hex dogging.
      c. Type 3 (Surface rod panic device with exterior key x pull handle x cylinder dogging):
         1) Panic: Precision Apex 2203CD.
         2) Exterior Handle: Rockwood BF 157 pull handle.
         3) Cylinders: Two (2) Schlage cylinders as defined in 1.09 Owner Hardware Requirements above.
         4) Panic bar shall be keyed cylinder dogging not hex dogging.
      d. Type 4 (Storm rated 2 point latching panic device with exterior key x thumbturn and pull handle):
         1) Panic: Von Duprin WSQEL-9927 Multi-Point Exit Device Auto Latching System.
         2) Exterior Handle: 377T Trim for Night Latch plus Door Pull H12J by Hager Hinge Company.

3) Cylinders: One (1) Schlage cylinder as defined in 1.09 Owner Hardware Requirements above.

e. Type 5 (Storm rated 2 point latching panic device with exterior key x lever handle):
1) Panic: Von Duprin WS9927-F Multi-Point Exit Device Auto Latching System.
2) Exterior Handle: L Trim for Lever handle.
3) Cylinders: One (1) Schlage cylinder as defined in 1.09 Owner Hardware Requirements above.

2. Provide fire-rated devices with fire-rated doors. Fire rated panics shall not be doggable. See door schedule.
3. When ELR or QEL is applicable provide manufacturer's power supply, control module and power transfer devices. Supplier to work with Owner to determine appropriate model(s) for each condition and function. Coordinate with Electronic Access System and Low Energy Door Operators Section 08 71 13.11.

H. Center Mullions: Certified by UL, cUL or Warnock Hersey for doors up to 8 feet by 8 feet.
1. Type 1: Removable:
a. Function: Removable only by key, keyed to building system; lockable without use of key.
b. Cylinders as defined in 1.09 Owner Hardware Requirements above.
c. Use to provide latching for all rim devices on pairs of doors unless noted otherwise.
d. Precision: KR-822.
2. Type 2: Standard fixed mullion.

I. Closers:
1. Type 1: 4040XP spring cush arm by LCN: www.lcnclosers.com.
a. Use spring H-Cush arms for all doors that require hold open function.
b. Stanley QDC119689 and QDC120689 models are acceptable equals.

J. Thresholds and Seals:
1. Type 1: Pemko Manufacturing Co.: www.pemko.com.
a. Threshold - Model 2005_T; color to be chosen by Architect.
b. Seal - PK33.
c. Weatherstriping - 3452_P; color to be chosen by Architect.

K. Drip Strip: All exterior doors to have NGP 16A (2.5" projection – clear anodized aluminum)

L. Door Stops: Provide appropriate type of door stop at each new door and existing doors where none exist. Determine type of stop through field verification. Wall stop finish to be US32D; floor stop finish to be US26D or match hardware finish if different from chrome finish.

M. Door Holders & Stops:
1. Type 1: Rockwood 490.

M. Soundproofing:
1. Heavy Duty High Sound Automatic Door Bottom:
a. TM Soundproofing product, width of door, prefinished aluminum.
2. Soundproof Door Saddle:
a. TM Soundproofing product, width of door, prefinished aluminum, 1/8" height.

O. Magnetic Hold Open: LCN SEM 7800 Series Magnets – Product 7850 Recessed wall-mounted. Include armature extensions as necessary dependent on door position and relationship to wall with hold open device.

P. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DOOR HARDWARE - GENERAL

A. Provide all hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.

B. Provide all items of a single type of the same model by the same manufacturer.

C. Provide products that comply with the following:
   1. Applicable provisions of federal, state, and local codes.
   2. ADA Standards for Accessible Design.
   3. ANSI/ICC A117.1, American National Standard for Accessible and Usable Buildings and Facilities.
   4. Applicable provisions of NFPA 101, Life Safety Code.
   5. Fire-Rated Doors: NFPA 80.
   6. All Hardware on Fire-Rated Doors: Listed and classified by UL as suitable for the purpose specified and indicated.

D. Provide non-removable pins (NRP) when hinges are exposed to the outside of a room with locking hardware.

E. Finishes: All door hardware the same finish unless otherwise indicated.
   1. Primary Finish: Satin chrome plated over nickel on brass or bronze, 626 (approx US26D).
   2. Finish Definitions: BHMA A156.18.
   3. Exceptions:
      a. Where base metal is specified to be different, provide finish that is an appearance equivalent according to BHMA A156.18.

2.03 KEYING

A. Contractor shall provide and install the door hardware and all pinning and installation of cores.
   1. For every keyway location provide one (1) pinned core, one (1) cut key, and two (2) uncut blank keys.
   2. For C keyway locations provide one (1) pinned core, and two (2) Kustom Key neuter bow SC1, key blanks http;//www.kustomkey.com/catalog/personalized-neuter-bow-key-blanks
      a. Key blanks to be embossed with "DO NOTE DUPLICATE" on one side with the other side to be blank for district stamping.
   3. Keying schedule will be provided by CPS once requested and after the keying meeting scheduled by the contractor.

B. Contractor shall contact the Director of Building Services to forward a letter of authorization to the authorized Schlage vendor to purchase the Schlage Everest "D" restricted hardware.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.

B. Use templates provided by hardware item manufacturer.

C. Do not install surface mounted items until finishes applied to substrate are complete.

D. Install hardware on fire-rated doors and frames in accordance with code and NFPA 80.

E. Mounting heights for hardware from finished floor to center line of hardware item:
   1. For steel doors and frames: Comply with DHI "Recommended Locations for Architectural Hardware for Steel Doors and Frames."
   2. For wood doors: Comply with DHI "Recommended Locations for Architectural Hardware for Wood Flush Doors."

3.03 ADJUSTING

A. Adjust work under provisions of Section 01 70 00.

B. Adjust hardware for smooth operation.

C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.04 CLEANING

A. Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.05 PROTECTION

A. Protect finished Work under provisions of Section 01 70 00.

B. Do not permit adjacent work to damage hardware or finish.

HARDWARE SETS

4.01 GENERAL

A. These Hardware Sets indicate requirements for single doors of that type, with conditional requirements for pairs and other situations.

B. Pairs of Swinging Doors: Provide one of each specified item on each leaf unless specifically stated otherwise. Treat pairs as two active leaves unless otherwise indicated.

C. Doors Who's Hardware is Specified in Other Sections But Which Must Be Keyed To Building System:
   1. Lock Cylinder, Mortise, keyed to building system.

4.02 HARDWARE SCHEDULE SEE ATTACHED

Door Hardware Schedule:

****All Groups shall include Type 1 hardware as called out in spec section 08 71 00 unless noted otherwise in this schedule. When specific doors are called out this overrides inclusion in other hardware groups.****

Group 1: Existing Double Doors to Exterior, pair of 3' doors

- Change out or add locking mechanism so the existing doors can be locked for no exit without staff effort. The doors are not required for emergency exiting.

Group 2: Single door from Main Office to Vestibule, single 3'-2" door

- Rim Panic
- Electric Strike
- Type 2 Hinges
- Auto Operator ED 250 Level

Group 3: All doors to Offices, single 3' door

- ND 93 Lockset
- Closer

Group 4: Half Height Door, single 3' door

- ND 80 Lockset

Group 5: Double Doors into Vestibule, pair of 3' doors

- Removable Center Mullion
- Rim Panic (Right Leaf)
- Electric Panic (Left Leaf)
- Auto Operator (Left Leaf) ED 100 Level
- Closer w/hold open (Right Leaf)

Group 6: Existing Double Doors into Vestibule, pair of 3' doors

- Auto Operator (Right Leaf) ED 100 Level

Group 7: Existing Double Doors from Vestibule, pair of 3' doors

- Replace existing Precision Rim Panic w/new Electric Retractable Latch Panic
- Modify door frame to accept new electrical for ERL Panic
- Auto Operator (Right Leaf) ED 100 Level
- FOB Reader (NIC)

END OF SECTION

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SECTION 08 71 13
AUTOMATIC DOOR OPERATORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Automatic door operators.

B. Actuators and safety devices.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on system components, sizes, features, and finishes.

C. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and manufacturer's hardware and component templates.

1.03 QUALITY ASSURANCE

A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of experience.

C. Installer Qualifications: Company specializing in performing the work of this section with minimum five years of experience.

D. Coordinate this work with hardware specified in Section 08 71 00.

1.04 WARRANTY

A. Correct defective Work within a two year period after Date of Substantial Completion.

B. Provide two year manufacturer warranty for motor and compressor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Door Operators for Swing Doors Specified in Other Sections:
   1. Dormakaba USA Inc. www.dormakaba.com
   2. Substitutions: See Division 1, for substitution requirements.

2.02 DOOR OPERATORS

A. Door Operator- Basis of Design for non-ballistic doors: ED100 Model.

B. Door Operator- Basis of Design for ballistic doors: ED250 Model.

C. Door operators will be required to interface with both the electric retractable latch exit devices or electric strikes and electronic door access system. Both intercoms and fob type access systems. Provide all necessary relays and similar items necessary to provide the required interface and achieve the Owner's desired usage each condition.

2.03 ACTUATORS

A. Actuator: Basis of design: ADA square push plates either hardwired or wireless depending on specific site conditions and mounting conditions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work and dimensions are as indicated on shop drawings.

B. Verify that electric power is available and is of the correct characteristics.

3.02 INSTALLATION

A. Install equipment in accordance with manufacturer's instructions.

B. Provide for dimensional distortion of components during operation.

C. Coordinate installation of components with related and adjacent work; level and plumb.

3.03 ADJUSTING

A. Adjust door equipment for correct function and smooth operation.

3.04 CLEANING

A. Remove temporary protection, clean exposed surfaces.

3.05 CLOSEOUT ACTIVITIES

A. Demonstrate operation, operating components, adjustment features, and lubrication requirements.

END OF SECTION

SECTION 08 80 00
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass and plastic glazing.

B. Glazing compounds and accessories.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

1.03 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual and GANA Sealant Manual for glazing installation methods.

B. Installer Qualifications: Company specializing in performing the work of this section approved by manufacturer.

1.04 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 50 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.05 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Sealed Insulating Glass Units: Provide a five (5) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

PART 2 PRODUCTS

2.01 GLAZING TYPES

A. Type IG-1 - Sealed Insulating Glass Units: Vision glazing, low-E.
   1. Application(s): All exterior glazing unless otherwise indicated.
   2. Substitutions: Refer to Section 01 60 00 - Product Requirements.
      a. Other products of the basis of design manufacturer and products of other manufacturers will be considered provided the overall performance is within the specified range(s) and the overall appearance is not significantly different from that of the specified product.
   3. Between-lite space filled with argon.
   4. Thermal Resistance (U-Value):.25, nominal.
   5. Total Solar Heat Gain Coefficient:.24, nominal.
   6. Total Visible Light Transmittance: 35 percent, nominal.
   7. Basis of Design: PPG Industries, Inc: www.ppgideascapes.com.
   8. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
      a. Coating: PPG Solarban 60 on # 2 surface, no coating on #3 surface.
      b. Tint: Solargray.
   9. Inboard Lite: Fully tempered float glass, 1/4 inch thick.
      a. Tint: None (clear).
   10. Total Thickness: 1 inch.

B. Type S1 - Single Safety Glazing: Non-fire-rated.
   1. Applications: Provide this type of glazing in the following locations:

a. Glazed lites in doors, except fire doors.
b. Glazed sidelights to interior doors, except in fire-rated walls and partitions.
c. Glazed view windows and panels in partitions, except in fire-rated walls and partitions.
d. Other locations required by applicable federal, state, and local codes and regulations.
e. Other locations indicated on the drawings.

2. Type: Fully tempered float glass as specified.
3. Tint: Clear.
4. Thickness: 1/4 inch.
5. Glazing Method: Interior wet/dry method, tape and sealant.

C. Type S-2- Tempered, Laminated Glazing
1. Application: Locations indicated on the drawings.
2. Thickness: 3/8 inch Tempered/ Laminated.

2.02 EXTERIOR GLAZING ASSEMBLIES

A. Structural Design Criteria: Select type and thickness to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with IBC 2012 code.
1. Use the procedure specified in ASTM E1300 to determine glass type and thickness.
2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
3. Thicknesses listed are minimum.

B. Air and Vapor Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier:
1. In conjunction with vapor retarder and joint sealer materials described in other sections.
2. To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapor retarder seal.
3. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

2.03 GLASS MATERIALS

A. Float Glass Manufacturers:
1. AGC Flat Glass North America, Inc: www.na.agc-flatglass.com.
2. Guardian Industries Corp: www.sunguardglass.com.
3. Pilkington North America Inc: www.pilkington.com/na.
4. PPG Industries, Inc: www.ppgideascapes.com.
5. Substitutions: Refer to Section 01 60 00 - Product Requirements.

B. Float Glass: All glazing is to be float glass unless otherwise indicated.
1. Annealed Type: ASTM C1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
2. Heat-Strengthened and Fully Tempered Types: ASTM C1048.
3. Tinted Types: Color and performance characteristics as indicated.
4. Thicknesses: As indicated; for exterior glazing comply with specified requirements for wind load design regardless of specified thickness.

C. Two-Way Mirror Glass: Mirror quality float glass (Q2) with factory coating.

2.04 SEALED INSULATING GLASS UNITS

A. Sealed Insulating Glass Units: Types as indicated.
1. Locations: Exterior, except as otherwise indicated.
2. Durability: Certified by an independent testing agency to comply with ASTM E2190.
3. Edge Spacers: Aluminum, bent and soldered corners.
4. Edge Seal: Glass to elastomer with supplementary silicone sealant.
5. Purge interpane space with dry hermetic air.

2.05 GLAZING COMPOUNDS

A. Manufacturers:
   1. Bostik Inc: www.bostik-us.com.
   2. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com.
   3. Pecora Corporation: www.pecora.com.
   4. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
   5. Substitutions: Refer to Section 01 60 00 - Product Requirements.

B. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; cured Shore A hardness of 15 to 25; color as selected.

2.06 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C 864 Option I. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper; size as recommended by the manufacturer for the application; black color.
   1. Manufacturers:
      a. Pecora Corporation: www.pecora.com.
      b. Tremco Global Sealants: www.tremcosealants.com.Product: Polyshim I I Tape (Basis of Design)
      c. Substitutions: Refer to Section 01 60 00 - Product Requirements.

D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option I; Black color.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

D. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.

E. Install sealant in accordance with manufacturer's instructions.

3.03 INSTALLATION - EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)

A. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.

B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.04 INSTALLATION - INTERIOR WET/DRY METHOD (TAPE AND SEALANT)

A. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch (1.6 mm) above sight line.

B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.

C. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.

D. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch intervals, 1/4 inch below sight line.

E. Fill gaps between pane and applied stop with Silicone sealant, as specified in to depth equal to bite on glazing, to uniform and level line.

F. Trim protruding tape edge.

3.05 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste.

END OF SECTION

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal stud wall framing.

B. Metal channel ceiling framing.

C. Gypsum wallboard.

D. Joint treatment and accessories.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

1.03 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing gypsum board application and finishing, with minimum 5 years of documented experience.

B. Copies of Documents at Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.
   1. See PART 3 for finishing requirements.

2.02 METAL FRAMING MATERIALS

A. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com.
   2. Marino: www.marinoware.com.
   3. Phillips Manufacturing Company: www.phillipsmfg.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
   1. Studs: "C" shaped with flat or formed webs with knurled faces.
   2. Runners: U shaped, sized to match studs.
   3. Ceiling Channels: C shaped.
   4. Furring: Hat-shaped sections, minimum depth of 7/8 inch.

C. Loadbearing Studs for Application of Gypsum Board: As specified in Section 05 40 00.

D. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.

E. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
   2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.

2.03 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. Georgia-Pacific Gypsum: www.gpgypsum.com.
   2. National Gypsum Company: www.nationalgypsum.com.
   3. USG Corporation: www.usg.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Gypsum Wallboard: Paper-faced Type X, gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
      a. Mold-resistant board is required on all walls of restrooms with gypsum wall board partitions.
   3. Thickness:
      a. Vertical Surfaces: 5/8 inch.
      b. Ceilings/ Soffits: 5/8 inch.
   4. Mold-Resistant Paper-Faced Products:
      a. Georgia-Pacific Gypsum; ToughRock Mold-Guard Type X Gypsum Wallboard.
      b. National Gypsum Company; Gold Bond Brand XP,Type X Gypsum Board.
      c. USG Corporation; Sheetrock Brand Mold Tough Type X Gypsum Panels.

2.04 ACCESSORIES

A. Finishing Accessories: ASTM C1047, galvanized steel, rolled zinc, or rigid plastic, unless otherwise indicated.
   1. Types: As detailed or required for finished appearance.
   2. Special Shapes: In addition to conventional cornerbead and control joints, provide U-bead, L-bead, and LC-bead at exposed panel edges as detailed.
   3. Manufacturers - Finishing Accessories:
      a. Same manufacturer as framing materials.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

B. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
   2. Ready-mixed vinyl-based joint compound.

C. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.

D. Screws for Attachment to Steel Members Less Than 0.03 inch In Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type.

E. Screws for Attachment to Steel Members From 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws for application of gypsum board to loadbearing steel studs.

F. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
   1. Level ceiling system to a tolerance of 1/1200.
   2. Laterally brace entire suspension system.
   3. Install bracing as required at exterior locations to resist wind uplift.

C. Studs: Space studs as indicated.
   1. Extend partition framing to structure in all locations.
   2. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

D. Standard Wall Furring: Install at locations shown on drawings, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 16 inches on center.
   1. Orientation: Horizontal or vertical as required by job conditions.

E. Blocking: Install mechanically fastened steel channel blocking for support of:
   1. Wall mounted cabinets.
   2. Toilet accessories.
   3. Wall mounted door hardware.
   4. Other items requiring blocking for support

3.03 BOARD INSTALLATION

A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

C. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

D. Installation on Metal Framing: Use screws for attachment of all gypsum board.

3.04 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as directed.
   1. Not more than 30 feet apart on walls and ceilings over 50 feet long.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.05 JOINT TREATMENT

A. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.

B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   2. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.

D. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.06 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

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SECTION 09 65 00
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring.

B. Resilient base.

C. Accessories.

D. PH and Adhesive Bond and Compatibility Testing.

E. ASTM D4263 Testing.

F. Coordination with Concrete Waterproofing Admixture Specified in Section 03 30 53, Miscellaneous Cast-In-Place Concrete.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Shop Drawings: Indicate seaming plan.

D. Verification Samples: Submit two samples, 4x4 inch in size illustrating color and pattern for each resilient flooring product specified.

E. Results of all testing.

F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Tiles and Base: Quantity equal to 5 percent of total installed of each color and pattern installed.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Protect roll materials from damage by storing on end.

1.04 FIELD CONDITIONS

A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 TILE FLOORING

A. Vinyl Composition Tile: Homogeneous, with color extending throughout thickness, and:
   1. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
   2. Size: 12 x 12 inch.
   3. Thickness: 0.125 inch.
   4. manufacturer, Pattern and Color: shown on finish schedule on drawings.
   5. Manufacturers:
      a. Armstrong World Industries, Inc: www.armstrong.com.(Basis of Design)
      b. Mannington Mills, Inc: www.mannington.com.
      c. Tarkett Inc: www.tarkett.com.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Feature Strips: Of same material as tile, factory or field cut, width indicated on drawings.

2.02 RESILIENT BASE

A. Resilient Base: ASTM F1861, Type TV, vinyl, thermoplastic; top set Style B, Cove, and as follows:
   1. Height: 4 inch.
   2. Thickness: 0.125 inch thick.
   3. Finish: Satin.
   4. Length: Roll.
   5. Color: See finish schedule on drawings.

2.03 ACCESSORIES

A. Patching Compound/ Sub-Floor Filler: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
   1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
   2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
   3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.

B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.

C. Moldings, Transition and Edge Strips: Same material as flooring.

D. Sealer and Wax: Types recommended by flooring manufacturer if any.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.

B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.

C. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

D. Cementitious Sub-floor Surfaces: Verify that substrates are ready for flooring installation by testing for pH. Moisture vapor transmission testing and relative humidity testing is not required, consistent with the concrete waterproofing admixture warranty against moisture related flooring failures specified in Section 03 30 53, Miscellaneous Cast-In-Place Concrete.

E. Verify that required floor-mounted utilities are in correct location.

3.02 MOISTURE VAPOR EMISSION TESTING

A. Moisture vapor transmission testing is not required, consistent with the concrete waterproofing admixture manufacturers warranty against moisture related flooring failures specified in Section 03 30 53, Miscellaneous Cast-In-Place Concrete.

3.03 INTERNAL RELATIVE HUMIDITY TESTING

A. Internal relative humidity testing is not required, consistent with the concrete waterproofing admixture manufacturers warranty against moisture related flooring failures specified in Section 03 30 53, Miscellaneous Cast-In-Place Concrete.

3.04 PH TESTING

A. PH Testing; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.

B. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

C. Note: This procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.

D. Use a wide range pH paper, its associated chart, and distilled or deionized water.

E. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the pH paper into the water, remove it, and compare immediately to chart to determine pH reading.

F. In the event that test values exceed floor covering manufacturer's limits, perform remediation as recommended by Flooring manufacturer.

3.05 ASTM D4263 TESTING

A. Standard Test Indicating Moisture by the Plastic Sheet Method:
   1. Perform one test area per 500 s.f. or portion thereof. These tests are required for compliance with warranty requirements of the concrete waterproofing admixture manufacturers warranty against moisture related flooring failures specified in Section 03 30 53, Miscellaneous Cast-In-Place Concrete.

3.06 PREPARATION

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

C. Coordinate with concrete waterproofing admixture specified in Section 03 30 53, Miscellaneous Cast-In-Place Concrete.

D. Prepare floor substrates for installation of flooring in accordance with requirements and recommendations of floor covering manufacturer.

E. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

F. Do not fill expansion joints, isolation joints, or other moving joints.

3.07 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.08 INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install in accordance with manufacturer's instructions.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Fit joints tightly.

E. Set flooring in place, press with heavy roller to attain full adhesion.

F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
   1. Resilient Strips: Attach to substrate using adhesive.

H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

I. Install feature strips where indicated (cut tile).

3.09 TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless manufacturer's instructions say otherwise.

B. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

3.10 RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Miter internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold. At exposed ends, use premolded units.

C. Install base on solid backing. Bond tightly to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

3.11 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean and wax in accordance with manufacturer's instructions.

3.12 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

3.13 SCHEDULE

A. See finish schedule on drawings for product, locations and colors.

END OF SECTION

SECTION 09 90 00
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints including designated floors.

C. Specified testing of substrates.

D. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following but not limited to the following:
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Ladder and other fabricated steel items.
   3. Exposed surfaces of steel lintels and ledge angles.
   4. Wood trim, doors, casings, etc.…
   5. Mechanical and Electrical:
      a. In finished areas, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.

E. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Non-metallic roofing and flashing.
   6. Stainless steel, anodized aluminum, bronze, terne, and lead items.
   7. Exterior insulation and finish system (EIFS).
   8. Glass.
   9. Acoustical materials, unless specifically so indicated.
   10. Concealed pipes, ducts, and conduits.
   11. Exterior galvanized pipe railings.

1.02 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of all products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
   3. Manufacturer's installation instructions.
   4. If proposal of substitutions is allowed under submittal procedures, explanation of all substitutions proposed.

C. Samples: Submit two painted samples, illustrating selected colors for each color and system selected with specified coats cascaded. Submit on tempered hardboard, 12x12 inch in size.

D. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.

E. Certification: By manufacturer that all paints and coatings do not contain any of the prohibited chemicals specified; GreenSeal GS-11 certification is not required but if provided shall constitute acceptable certification.

F. Certification: Prior to installation of floor coating, submit written certification by floor coating manufacturer and installer that condition of sub-floor is acceptable.

G. Results of all required testing.

H. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.

I. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Paint and Coatings: 1 gallon of each color; store where directed.
   3. Label each container with color in addition to the manufacturer's label.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum ten years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years documented experience.

1.05 MOCK-UP

A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.

B. Provide panels, 2 feet long by 2 feet wide, illustrating each paint and coating color, texture, and finish. Apply the same number of coats as specified.

C. Locate where directed.

D. Mock-up may remain as part of the work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.07 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.

B. Paints:
   1. Benjamin Moore & Co: www.benjaminmoore.com.
   2. PPG Architectural Finishes, Inc: www.ppgaf.com.
   3. Sherwin-Williams Company: www.sherwin-williams.com. (Basis of Design)

C. Primer Sealers: Same manufacturer as top coats.

D. Block Fillers: Same manufacturer as top coats.

E. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
   4. Supply each coating material in quantity required to complete entire project's work from a single production run.
   5. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

D. Chemical Content: The following compounds are prohibited:
   1. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
   2. Acrolein, acrylonitrile, antimony, benzene, butyl benzyl phthalate, cadmium, di (2-ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2-dichlorobenzene, diethyl phthalate, dimethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride.

E. Flammability: Comply with applicable code for surface burning characteristics.

F. Colors: As indicated on drawings in finish schedule.
   1. Extend colors to surface edges; colors may change at any edge as directed by Architect.
   2. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.

2.03 PAINT SYSTEMS - EXTERIOR

A. Exterior Ferrous Metal Galvanized and Non- Galvanized; Lintels, downspout shoes and other ferrous metal items shown on drawings to be painted.
   1. Preparation as specified by manufacturer.
   2. Two top coats and one coat primer.
   3. Semi-gloss.
   4. Top Coat Product:
      a. Sherwin Williams DTM Acrylic Coating Product NO B-66-W2-11.
   5. Primer: Sherwin Williams DTM Acrylic Primer Product No. B-66-W1.

B. Exterior Concrete Surfaces.
   1. Two top coats and one coat primer.
   2. Semi-gloss: MPI gloss level 5; use this sheen at all locations.
   3. Top Coat Product(s):
      a. Sherwin-Williams Macropoxy 646 Fast Cure Epoxy.
   4. Primer(s): As recommended by manufacturer of top coats for surface being applied to.

2.04 PAINT SYSTEMS - INTERIOR

A. All Interior Surfaces Indicated to be Painted, Unless Otherwise Indicated: Including gypsum board, concrete, concrete masonry, shop primed steel, galvanized steel and wood trim, door casings, etc…..
   1. Two top coats and one coat primer.
   2. Semi-gloss: MPI gloss level 5; use this sheen at all locations.
   3. Top Coat Product(s):
      a. Sherwin-Williams Pre-Catalyzed Waterbased Epoxy.
   4. Primer(s): As recommended by manufacturer of top coats for surface being applied to.

B. All Interior Soffit and Ceiling Surfaces Indicated to be Painted, Unless Otherwise Indicated.
   1. Two top coats and one coat primer.
   2. Eggshell: MPI gloss level 3; use this sheen at all locations.
   3. Top Coat Product(s):
      a. Sherwin-Williams Pre-Catalyzed Waterbased Epoxy.
   4. Primer(s): As recommended by manufacturer of top coats for surface being applied to.

C. Heavy Duty Vertical: Including gypsum board and concrete masonry.
   1. Applications: All walls in rooms scheduled to receive the epoxy floor coating as described in 09 96 00 High Performance Coatings..
   2. Two top coats and one coat primer; primer may be omitted if top coat manufacturer approves.
   3. Top Coat Product(s):
      a. Sherwin-Williams Macropoxy 646 Fast Cure Epoxy.
   4. Primer(s): As recommended by manufacturer of top coats for surface being applied to.

D. Dry Fall: Metals; exposed structure and overhead-mounted services, including shop primed steel deck, structural steel, metal fabrications, galvanized ducts, galvanized conduit, galvanized piping, and other similar exposed to view items..
   1. Most items are shop primed by others but use primer as recommended by manufacturer of top coat for any unprimed surfaces.
   2. One top coat color in finish schedule on drawings.
   3. Eggshell: MPI gloss level 3; use this sheen at all locations.
   4. Top Coat Product(s):
      a. Sherwin-Williams Waterborne Acrylic Dryfall.

E. Concrete Floors Indicated to be Painted.
   1. Two top coats and one coat primer recommended by manufacturer.
   2. Top Coat Product(s):
      a. Sherwin-Williams ArmorSeal Rexthane Moisture Cured Urethane.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of coatings until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

E. Test shop-applied primer for compatibility with subsequent cover materials.

F. Moisture Testing: Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
   3. Concrete Floors and Traffic Surfaces: Moisture vapor transmission testing and Internal relative humidity testing is not required, consistent with the concrete waterproofing admixture manufacturer's warranty against moisture related flooring failures specified in Section 03 30 53, Miscellaneous Cast-In-Place Concrete.

G. ASTM D4263, Standard Test Indicating Moisture by the Plastic Sheet Method: Perform one test area per 500 s.f. or portion thereof. These tests are required for compliance with warranty requirements of the concrete waterproofing admixture manufacturer's warranty against moisture related flooring failures specified in Section 03 30 53, Miscellaneous Cast-In-Place Concrete.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or repair existing coatings that exhibit surface defects.

D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

H. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.

I. Concrete Floors:
   1. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

2. Do not use solvents or other chemicals for cleaning.
3. Coordinate with concrete waterproofing admixture specified in Section 03 30 53, Miscellaneous Cast-In-Place Concrete.
4. Prepare floor substrates for installation of flooring in accordance with requirements and recommendations of manufacturer.
5. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
6. Do not fill expansion joints, isolation joints, or other moving joints.

J. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

K. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-PC 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).

L. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand or power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

M. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's instructions.

C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

E. Apply each coat to uniform appearance.

F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

G. Sand metal surfaces lightly between coats to achieve required finish.

H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

A. Protect finished coatings until completion of project.

B. Touch-up damaged coatings after Substantial Completion.

END OF SECTION

SECTION 10 11 01
VISUAL DISPLAY BOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Markerboards and Tackboards.

B. Tackboards in display cabinets.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's data on markerboard, tackboard, tackboard surface covering, trim, and accessories.

C. Shop Drawings: Indicate wall elevations, dimensions, joint locations, special anchor details.

D. Samples: Submit color charts for selection of color and texture of markerboard, tackboard, tackboard surface covering, and trim.

E. Manufacturer's printed installation instructions.

F. Maintenance Data: Include data on regular cleaning, stain removal.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.04 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide five year warranty for markerboard to include warranty against discoloration due to cleaning, crazing or cracking, and staining.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Visual Display Boards:
   1. Basis of Design: MooreCo, Inc; Product Porcelain Steel Marker board- ABC Trim plus Map Rail / Vinyl Add- Cork Tackboard with Aluminum Trim: www.moorecoinc.com.
   2. Claridge Products and Equipment, Inc: www.claridgeproducts.com.
   3. Polyvision Corporation (Nelson Adams): www.polyvision.com <http://www.polyvision.com>.
   4. Marsh Industries: www.marsh-ind.com <http://www.marsh-ind.com>.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 VISUAL DISPLAY BOARDS

A. Markerboards: Porcelain enamel on steel, laminated to core.
   1. Color: White.
   2. Metal Face Sheet Thickness: 0.015 inch (28 gage).
   3. Core: Hardboard, manufacturer's standard thickness, laminated to face sheet.
   4. Backing: Aluminum foil, laminated to core.
   5. Size: As indicated on drawings.
   6. Frame: Extruded aluminum, with concealed fasteners.
   7. Frame Profile: Manufacturers Standard
   8. Frame Finish: Anodized, natural.

B. Tackboards: Fabric laminated to cork.
   1. Cork Thickness: 1/8 inch.
   2. Fabric: Vinyl coated fabric.
   3. Color: As selected from manufacturer's full range.
   4. Backing: Fiberboard, 3/8 inch thick, laminated to tack surface.

5. Surface Burning Characteristics: Flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.
6. Size: As indicated on drawings.
7. Frame: Extruded aluminum, with concealed fasteners.
8. Frame Profile: Manufacturer's standard
9. Frame Finish: Anodized, natural.

C. Tackboards (in display cases): Fabric laminated to cork.
1. Cork Thickness: 1/8 inch.
2. Fabric: Vinyl coated fabric.
3. Color: As selected from manufacturer's full range.
4. Backing: Fiberboard, 3/8 inch thick, laminated to tack surface.
5. Surface Burning Characteristics: Flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.
6. Size: As indicated on drawings.

2.03 MATERIALS

A. Porcelain Enameled Steel Sheet: ASTM A424, Type I, Commercial Steel, with fired-on vitreous finish.

B. Vinyl Coated Fabric: ASTM F793 Category VI; clear top overcoat of polyvinyl fluoride in accordance with FS L-P-1040 Type 1, Grade B, Class 2, 0.0005 inch thick.

C. Hardboard for Cores: AHA A135.4, Class 1 - Tempered, S2S (smooth two sides).

D. Foil Backing: Aluminum foil sheet, 0.005 inch thick.

2.04 ACCESSORIES

A. Temporary Protective Cover: Sheet polyethylene, 8 mil thick.

B. Mounting Brackets: Concealed.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that internal wall blocking is ready to receive work and positioning dimensions are as indicated on shop drawings.

C. Verify flat wall surface for frameless adhesive-applied boards.

3.02 INSTALLATION

A. Install boards in accordance with manufacturer's instructions.

B. Secure units level and plumb.

3.03 CLEANING

A. Clean board surfaces in accordance with manufacturer's instructions.

B. Cover with protective cover, taped to frame.

C. Remove temporary protective cover at date of Substantial Completion.

END OF SECTION

SECTION 10 14 00
SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Room and door signs.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.

C. Shop Drawing: Drawing showing signs and plaques identifying font type, size, overall sign image to scale with dimensions.

D. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
   1. When room numbers to appear on signs differ from those on the drawings, include the drawing room number on schedule.
   2. Submit for approval by Owner through Architect prior to fabrication.

E. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.

F. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.

G. Verification Samples: Submit samples showing colors specified.

H. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Store tape adhesive at normal room temperature.

1.04 FIELD CONDITIONS

A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Flat Signs:
   1. Interior Signage:
   2. Basis of Design: Best Sign Systems, Inc; Product Graphic Blast MP ADA Signs: www.bestsigns.com.
   3. Cosco Industries (ADA signs): www.coscoarchitecturalsigns.com.
   4. InPro Corporation; Aspen: www.inprocorp.com.
   5. Mohawk Sign Systems, Inc: www.mohawksign.com.
   6. Seton Identification Products: www.seton.com/aec.
   7. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 SIGNAGE APPLICATIONS

A. Accessibility Compliance: All signs are required to comply with ADA Standards for Accessible Design and ANSI/ICC A 117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

B. Room and Door Signs: Where shown on drawings, with the room names and numbers as shown on drawings. Locate signs for single doors on the latch side of the opening. Locate signs for double doors on the right side when facing the doors in the direction of travel for the room being identified.
   1. Sign Type: Flat signs with engraved panel media as specified.
   2. All flat Signage: "Tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
   3. Character Height: 1 inch or as shown on drawings.
   4. Sign Height: Shown on drawings

2.03 SIGN TYPES

A. Flat Signs: Signage media without frame.
   1. Edges: Bevelled.
   2. Corners: Radiused.
   3. Wall Mounting of One-Sided Signs: Tape adhesive.

B. Color and Font: Unless otherwise indicated:
   1. Character Font: Helvetica, Arial, or other sans serif font.
   2. Character Case: Upper and lower case (title case).
   3. Colors: To be selected from manufacturers premium colors.
      a. Background Color: To be selected.
      b. Character Color: Contrasting to be selected.

C. Total Thickness: 1/8 inch.

2.04 TACTILE SIGNAGE MEDIA

A. Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:
   1. Total Thickness: 1/8 inch.

2.07 ACCESSORIES

A. Concealed Screws or other fasteners: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.

B. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install neatly, with horizontal edges level.

C. Protect from damage until Substantial Completion; repair or replace damage items.

END OF SECTION

SECTION 10 75 00
FLAGPOLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum Flagpoles.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on pole, accessories, and configurations.

C. Shop Drawings: Indicate detailed dimensions, base details, anchor requirements, and imposed loads.

D. Operation Data: Provide operating data for the controller.

E. Maintenance Data: Provide lubrication and periodic maintenance requirement schedules and other pertinent information.

1.03 QUALITY ASSURANCE

A. Designer Qualifications: Design flagpole foundation under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed the State in which the Project is located.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Spiral wrap flagpole with protective covering and pack in protective shipping tubes or containers.

B. Protect flagpole and accessories from damage or moisture.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Flagpoles:
   1. American Flagpole; Product Architectural Elite Series- External Halyard- Single Revolving Truck: www.americanflagpole.com.
   2. Concord Industries, Inc: www.concordindustries.com.
   3. Pole-Tech Co., Inc: www.poletech.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FLAGPOLES

A. Flagpoles: Aluminum.
   1. Design: Cone tapered.
   2. Mounting: Ground mounted type.
   3. Outside Butt Diameter: 6 inches.
   4. Outside Tip Diameter: 3-1/2 inches.
   5. Nominal Wall Thickness:.188 inches.
   6. Nominal Height: 30 ft; measured from top of base.
   7. Halyard: External - single revolving type.

B. Performance Requirements:
   1. Flagpole With Flag Flying: Resistant without permanent deformation to 120 miles/hr wind velocity; non-resonant, safety design factor of 2.5.
   2. Flagpole Without Flag: Resistant without permanent deformation to 217 miles/hr wind velocity; non-resonant, safety design factor of 2.5.

2.03 ACCESSORIES

A. Finial Ball: Aluminum, 6 inch diameter, gold anodized.

B. Truck Assembly: Cast aluminum; revolving, stainless steel ball bearings, non-fouling.

C. Cleats: 9 inch size, aluminum with stainless steel fastenings, two per halyard.

D. Halyard: 5/16 inch diameter polypropylene, braided, white. Provide two snap hooks with neopreme covers.

E. Flashing Collar: Spun Aluminum.

F. Flag: 5' x 8' Embroidered Nylon, Product Number: Flag-US-05.

2.04 MOUNTING COMPONENTS

A. Foundation Tube Sleeve: AASHTO M 36M, corrugated 16 gage steel, galvanized, depth of 36 inches,. furnish with grounding spike.

2.05 FINISHING

A. Metal Surfaces in Contact With Concrete: Asphaltic paint.

B. Aluminum: Natural Anodized.

C. Finial: Gold anodized finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that concrete foundation is ready to receive work and dimensions are as indicated on shop drawings.

3.02 PREPARATION

A. Coat metal sleeve surfaces below grade and surfaces in contact with dissimilar materials with asphaltic paint.

3.03 INSTALLATION

A. Install flagpole and fittings in accordance with manufacturer's instructions.

B. Fill foundation tube sleeve with concrete specified in Section 03 30 00.

C. Install foundation plate and centering wedges for flagpoles base set in concrete base and fasten.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1 inch.

3.05 ADJUSTING

A. Adjust operating devices so that halyard and flag function smoothly.

END OF SECTION

SECTION 11 66 23
ATHLETIC EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Basketball backboards, goals, and support framing for outside.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Large Components: Ensure that large components can be moved into final position without damage to other construction.

B. Electrically Operated Equipment: Coordinate location and electrical characteristics of service connection.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's data showing configuration, sizes, materials, finishes, hardware, and accessories; include:
   1. Electrical characteristics and connection locations.
   2. Fire rating certifications.
   3. Structural steel welder certifications.
   4. Manufacturer's installation instructions.

C. Erection Drawings: Detailed dimensional requirements for proper location of equipment.

D. Operating and maintenance data, for each operating equipment item.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to project site in manufacturer's original packaging with factory original labels attached.

B. Store products indoors and elevated above floor; prevent warping, twisting, or sagging.

C. Store products in accordance with manufacturer's instructions; protect from extremes of weather, temperature, moisture, and other damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Gymnasium Equipment:
   1. Draper, Inc: www.draperinc.com.
   2. Basis of Design: Performance Sports Systems: www.perfsports.com.
   3. Porter Athletic Equipment Company: www.porter-ath.com.
   4. Airizona Courtlines, Inc.; www.arizonacourtlines.com <http://www.arizonacourtlines.com>.
   5. Aalco Manufacturing Co.: www.aalcomfg.com <http://www.aalcomfg.com>
   6. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 GYMNASIUM EQUIPMENT - GENERAL REQUIREMENTS

A. See drawings for sizes and locations.

B. Where mounting dimensions or sizes are not indicated, comply with applicable requirements of the following:
   1. National Federation of State High School Associations (NFHS) sports rules.

C. Provide mounting plates, brackets, and anchors of sufficient size and strength to securely attach equipment to building structure; comply with requirements of contract documents.

D. Hardware: Heavy duty steel hardware, as recommended by manufacturer.

E. Electrical Wiring and Components: Comply with NFPA 70; provide UL-listed equipment.

F. Structural Steel Fabrications: Welded in accordance with AWS D1.1/D1.1M, using certified welders.

2.03 BASKETBALL

A. Gooseneck Outdoor Pole Mounted Basketball System, Pole, Backboard and Goal
   1. Backstop/Pole:.Basis of Design Product Model PK6015 Heavy Duty Gooseneck Outdoor Basketball System manufactured by Performance Sports Systems: www.perfsports.com.
      a. Post: 5-9/16 " O.D. galvanized pipe.
      b. Mounting Plate: Used for direct attachment for the backboard. Braced with two braces extending from the upper mounting points of the backboard to the gooseneck extension.
   2. Backboards for outside Pole Mounted Backstop: Marked Steel, rectangular shaped.
      a. Basis of Design Product Model 1260B, 42" x 60" Rectangular Steel Backboard manufactured by Performance Sports Systems: www.perfsports.com.
         1) Frame: Welded Steel Tubular with two vertical struts for mounting to support structure.
         2) Markings: Painted.
         3) Provide mounting kit.
         4) Rim: Titan fixed double rim 7550.
         5) Color: Manufacturer's standard.

PART 3 EXECUTION

3.01 EXAMINATION

A. Take field measurements to ensure proper fitting of work. If taking field measurements before fabrication will delay work, allow for adjustments within recommended tolerances.

B. Inspect areas and conditions before installation. Notify Architect in writing of unsatisfactory or detrimental conditions. Do not proceed until conditions have been corrected. Commencing installation constitutes acceptance of work site conditions.

C. Verify that electrical services are correctly located and of the proper characteristics.

3.02 INSTALLATION

A. Install in accordance with contract documents and manufacturer's instructions.

B. Install equipment rigid, straight, plumb, and level.

C. Secure all equipment with manufacturer's recommended anchoring devices.

D. Install wall padding securely, with edges tight to wall and without wrinkles in fabric covering.

E. Separate dissimilar metals to prevent electrolytic corrosion.

3.03 ADJUSTING

A. Verify proper placement of equipment.

B. Verify proper placement of equipment anchors and sleeves. Use actual movable equipment to be anchored if available.

3.04 CLEANING

A. Remove masking or protective covering from finished surfaces.

B. Clean equipment in accordance with manufacturer's recommendations.

3.05 PROTECTION

A. Protect installed products until Substantial Completion.

B. Replace damaged products before Substantial Completion.

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Copper building wire rated 600 V or less.
   2. Aluminum building wire rated 600 V or less.
   3. Metal-clad cable, Type MC, rated 600 V or less.
   4. Connectors, splices, and terminations rated 600 V and less.

B. Related Requirements:
   1. Section 26 05 13 "Medium-Voltage Cables" for single-conductor and multiconductor cables, cable splices, and terminations for electrical distribution systems with 601 to 35,000 V.
   2. Section 26 05 23 "Control-Voltage Electrical Power Cables" for control systems communications cables and Classes 1, 2, and 3 control cables.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: Indicate type, use, location, and termination locations.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. American Bare Conductor.
   2. Encore Wire Corporation.
   3. Southwire Company.

C. Standards:
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
   2. RoHS compliant.
   3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

E. Conductor Insulation:
   1. Type THHN: Comply with UL 83.
   2. Type XHHW-2: Comply with UL 44.

2.2 ALUMINUM BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn aluminum current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. American Bare Conductor.
   2. Encore Wire Corporation.
   3. Southwire Company.

C. Standards:
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
   2. RoHS compliant.
   3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Conductors: Aluminum, complying with ASTM B 800 and ASTM B 801.

E. Conductor Insulation:
   1. Type THHN: Comply with UL 83.
   2. Type XHHW-2: Comply with UL 44.

2.3 METAL-CLAD CABLE, TYPE MC

A. Description: A factory assembly of one or more current-carrying insulated conductors in an overall metallic sheath.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. American Bare Conductor.
   2. Encore Wire Corporation.
   3. Southwire Company.

C. Standards:
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
   2. Comply with UL 1569.
   3. RoHS compliant.
   4. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Circuits:
   1. Single circuit.
   2. Power-Limited Fire-Alarm Circuits: Comply with UL 1424.

E. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

F. Ground Conductor: Insulated.

G. Conductor Insulation:
   1. Type TFN/THHN/THWN-2: Comply with UL 83.
   2. Type XHHW-2: Comply with UL 44.

H. Armor: Aluminum, interlocked.

2.4 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Hubbell Power Systems, Inc.
   2. ILSCO.
   3. Thomas & Betts Corporation; A Member of the ABB Group.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper for feeders smaller than No. 4 AWG; copper or aluminum for feeders No. 4 AWG and larger. Conductors shall be solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

C. Power-Limited Fire Alarm and Control: Solid for No. 12 AWG and smaller.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Service Entrance: Type XHHW-2, single conductors in raceway.

B. Exposed Feeders: Type XHHW-2, single conductors in raceway.

C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN/THWN-2, single conductors in raceway.

D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

E. Feeders in Cable Tray: Metal-clad cable, Type MC.

F. Exposed Branch Circuits, Including in Crawlspaces: Type THHN/THWN-2, single conductors in raceway.

G. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.

H. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

I. Whips to Individual Light Fixtures, no greater than 6 feet in length: Metal-clad cable, Type MC.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points according to Section 26 05 33 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

F. Support cables according to Section 26 05 29 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 26 05 53 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 05 44 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 07 84 13 "Penetration Firestopping."

END OF SECTION

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes grounding and bonding systems and equipment.

1.2 ACTION SUBMITTALS

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

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 CONDUCTORS

A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:
   1. Solid Conductors: ASTM B 3.
   2. Stranded Conductors: ASTM B 8.
   3. Tinned Conductors: ASTM B 33.
   4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
   5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
   6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
   7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.3 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.

C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

D. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

2.4 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel; 5/8 by 96 inches.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2/0 AWG minimum.
   1. Bury at least 24 inches below grade.

C. Conductor Terminations and Connections:
   1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
   2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.

3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING AT THE SERVICE

A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
1. Feeders and branch circuits.
2. Lighting circuits.
3. Receptacle circuits.
4. Single-phase motor and appliance branch circuits.
5. Three-phase motor and appliance branch circuits.
6. Flexible raceway runs.
7. Armored and metal-clad cable runs.
8. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.

B. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

C. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.

D. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.4 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.

C. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
2. For grounding electrode system, install at least three rods spaced at least one-rod length and at most two-rod lengths from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.

D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

E. Grounding and Bonding for Piping:
   1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
   2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
   3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

3.5 FIELD QUALITY CONTROL

A. Perform tests and inspections. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.

B. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance

END OF SECTION

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SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
   1. Hangers and supports for electrical equipment and systems.
   2. Construction requirements for concrete bases.

1.2 PERFORMANCE REQUIREMENTS

A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.

B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.3 ACTION SUBMITTALS

A. Product Data: For steel slotted support systems.

1.4 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1.5 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Cooper B-Line, Inc.; a division of Cooper Industries.
      b. ERICO International Corporation.
      c. Thomas & Betts Corporation, A Member of the ABB Group.
   2. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
   3. Channel Dimensions: Selected for applicable load criteria.

B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

C. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
    a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
        1) Hilti, Inc.
        2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
        3) Simpson Strong-Tie Co., Inc.
2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
    a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
        1) Cooper B-Line, Inc.; a division of Cooper Industries.
        2) Hilti, Inc.
        3) ITW Ramset/Red Head; Illinois Tool Works, Inc.
3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slottedsupport system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
    1. Secure raceways and cables to these supports with single-bolt conduit clamps.

D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
    1. To Wood: Fasten with lag screws or through bolts.
    2. To New Concrete: Bolt to concrete inserts.

3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
7. To Light Steel: Sheet metal screws.
8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Section 05 50 00 "Metal Fabrications" for site-fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES

A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

B. Use 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Section 03 30 53 "Miscellaneous Cast-in-Place Concrete."

C. Anchor equipment to concrete base.
1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.5 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

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SECTION 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Metal conduits, tubing, and fittings.
   2. Nonmetal conduits, tubing, and fittings.
   3. Metal wireways and auxiliary gutters.
   4. Boxes, enclosures, and cabinets.
   5. Handholes and boxes for exterior underground cabling.

B. Related Requirements:
   1. Section 27 05 28 "Pathways for Communications Systems" for conduits, wireways, surface pathways, innerduct, boxes, faceplate adapters, enclosures, cabinets, and handholes serving communications systems.
   2. Section 28 05 28 "Pathways for Electronic Safety and Security" for conduits, surface pathways, innerduct, boxes, and faceplate adapters serving electronic safety and security.

1.2 ACTION SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

A. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. GRC: Comply with ANSI C80.1 and UL 6.

C. IMC: Comply with ANSI C80.6 and UL 1242.

D. EMT: Comply with ANSI C80.3 and UL 797.

E. FMC: Comply with UL 1; zinc-coated steel.

F. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

G. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
   1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
   2. Fittings for EMT:
      a. Material: Die cast.
      b. Type: Setscrew.
   3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.

H. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

A. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

C. Fittings for RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

A. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 unless otherwise indicated, and sized according to NFPA 70.

1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

2.4 BOXES, ENCLOSURES, AND CABINETS

A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

D. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

E. Metal Floor Boxes:
1. Material: Cast metal or sheet metal.
2. Type: Fully adjustable.
3. Shape: Rectangular.
4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

F. Nonmetallic Floor Boxes: Nonadjustable, round.
1. Listing and Labeling: Nonmetallic floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

G. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

H. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.

I. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

J. Device Box Dimensions: 4 inches by 2-1/8 inches by 2-1/8 inches deep.

K. Gangable boxes are allowed.

L. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 with continuous-hinge cover with flush latch unless otherwise indicated.
1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Nonmetallic Enclosures: Plastic.
3. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

M. Cabinets:
1. NEMA 250, Type 1 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.
6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.5 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. General Requirements for Handholes and Boxes:
1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.
   1. Standard: Comply with SCTE 77.
   2. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
   3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
   4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
   5. Cover Legend: Molded lettering, "ELECTRIC.".
   6. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
   1. Exposed Conduit: GRC.
   2. Concealed Conduit, Aboveground: IMC.
   3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried.
   4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
   5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated.
   1. Exposed, Not Subject to Physical Damage: EMT.
   2. Exposed, Not Subject to Severe Physical Damage: EMT.
   3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
      a. Loading dock.
      b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
      c. Mechanical rooms.
      d. Gymnasiums.
   4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
   5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
   6. Damp or Wet Locations: IMC.
   7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 nonmetallic in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size: 3/4-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.
   1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
   2. EMT: Use setscrew, cast-metal fittings. Comply with NEMA FB 2.10.
   3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

F. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

3.2 INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for hangers and supports.

D. Arrange stub-ups so curved portions of bends are not visible above finished slab.

E. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

F. Support conduit within 12 inchesof enclosures to which attached.

G. Raceways Embedded in Slabs:
   1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
   2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
   3. Arrange raceways to keep a minimum of 1 inch of concrete cover in all directions.
   4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.

H. Stub-ups to Above Recessed Ceilings:
   1. Use EMT, IMC, or RMC for raceways.
   2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

I. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

J. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

K. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces.

L. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
   1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
   2. Where an underground service raceway enters a building or structure.
   3. Where otherwise required by NFPA 70.

M. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
   1. Use LFMC in damp or wet locations subject to severe physical damage.
   2. Use LFMC in damp or wet locations not subject to severe physical damage.

N. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to bottom of box unless otherwise indicated.

O. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between the box and cover plate or the supported equipment and box.

P. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

Q. Locate boxes so that cover or plate will not span different building finishes.

R. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

S. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

T. Set metal floor boxes level and flush with finished floor surface.

U. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:
   1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Section 31 20 00 "Earth Moving" for pipe less than 6 inches in nominal diameter.
   2. Install backfill as specified in Section 31 20 00 "Earth Moving."
   3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 31 20 00 "Earth Moving."
   4. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
      a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
      b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.
   5. Underground Warning Tape: Comply with requirements in Section 26 05 53 "Identification for Electrical Systems."

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.

D. Install handholes with bottom below frost line.

E. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 05 44 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.6 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 07 84 13 "Penetration Firestopping."

3.7 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.
   1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 26 09 23
LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Time switches.
   2. Photoelectric switches.
   3. Outdoor motion sensors.
   4. Lighting contactors.

B. Related Requirements:
   1. Section 26 27 26 "Wiring Devices" for wall-box dimmers, non-networkable wall-switch occupancy sensors, and manual light switches.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:
   1. Show installation details for the following:
      a. Occupancy sensors other than fixture mounted occupancy sensors.
      b. Vacancy sensors.
   2. Interconnection diagrams showing field-installed wiring.
   3. Include diagrams for power, signal, and control wiring.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plan(s) and elevations, drawn to scale and coordinated with each other, using input from installers of the items involved.

B. Field quality-control reports.

C. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

B. Software and firmware operational documentation.

1.5 WARRANTY

A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace lighting control devices that fail(s) in materials or workmanship within specified warranty period.
   1. Warranty Period: Two year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 TIME SWITCHES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Cooper Industries, Inc.
   2. Leviton Manufacturing Co., Inc.
   3. NSi Industries LLC.

B. Electronic Time Switches: Solid state, programmable, with alphanumeric display; complying with UL 917.
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Contact Configuration: SPST.
   3. Contact Rating: 20-A ballast load, 120-/240-V ac.
   4. Programs: Eight on-off set points on a 24-hour schedule and an annual holiday schedule that overrides the weekly operation on holidays.

5. Circuitry: Allow connection of a photoelectric relay as substitute for on-off function of a program.
6. Astronomic Time: Selected channels.
7. Automatic daylight savings time changeover.
8. Battery Backup: Not less than seven days reserve, to maintain schedules and time clock.

2.2 OUTDOOR PHOTOELECTRIC SWITCHES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Cooper Industries, Inc.
2. Leviton Manufacturing Co., Inc.
3. NSi Industries LLC.

B. Description: Solid state, with SPST dry contacts rated for 1000 W incandescent or 1800 VA inductive, to operate connected relay, contactor coils, or microprocessor input; complying with UL 773A, and compatible with ballasts and LED lamps.
1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Light-Level Monitoring Range: 1.5 to 10 fc, with an adjustment for turn-on and turn-off levels within that range, and a directional lens in front of the photocell to prevent fixed light sources from causing turn-off.
3. Time Delay: Fifteen-second minimum, to prevent false operation.
4. Surge Protection: Metal-oxide varistor.
5. Mounting: Twist lock complies with NEMA C136.10, with base-and-stem mounting or stem-and-swivel mounting accessories as required to direct sensor to the north sky exposure.
6. Failure Mode: Luminaire stays ON.

2.3 OUTDOOR MOTION SENSORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Cooper Industries, Inc.
2. Leviton Manufacturing Co., Inc.
3. NSi Industries LLC.

B. Description: Solid-state outdoor motion sensors.
1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. PIR type, weatherproof. Detect occurrences of 6-inch-minimum movement of any portion of a human body that presents a target of not less than 36 sq. in.. Comply with UL 773A.
3. Switch Rating:
   a. Luminaire-Mounted Sensor: 1000-W incandescent, 500-VA fluorescent/LED.
4. Switch Type: SP, dual circuit.
5. Voltage: Match the circuit voltage type.
6. Detector Coverage:
   a. Standard Range: 210-degree field of view, with a minimum coverage area of 900 sq. ft..
   b. Long Range: 180-degree field of view and 110-foot detection range.
7. Ambient-Light Override: Concealed, field-adjustable, light-level sensor from 10 to 150 fc. The switch prevents the lights from turning on when the light level is higher than the set point of the sensor.
8. Concealed, field-adjustable, "off" time-delay selector at up to 30 minutes.
9. Operating Ambient Conditions: Suitable for operation in ambient temperatures ranging from minus 40 to plus 130 deg F, rated as "raintight" according to UL 773A.

2.4 LIGHTING CONTACTORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Eaton.
2. Leviton Manufacturing Co., Inc.
3. Schneider Electric USA (Square D).

B. Description: Electrically operated and electrically held, combination-type lighting contactors with nonfused disconnect, complying with NEMA ICS 2 and UL 508.
1. Current Rating for Switching: Listing or rating consistent with type of load served, including tungsten filament, inductive, and high-inrush ballast (ballast with 15 percent or less THD of normal load current).
2. Fault Current Withstand Rating: Equal to or exceeding the available fault current at the point of installation.
3. Enclosure: Comply with NEMA 250.
4. Provide with control and pilot devices as indicated on Drawings, matching the NEMA type specified for the enclosure.

2.5 CONDUCTORS AND CABLES

A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

B. Classes 2 and 3 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 22 AWG. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

C. Class 1 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 16 AWG. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1.

B. Examine lighting control devices before installation. Reject lighting control devices that are wet, moisture damaged, or mold damaged.

C. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.

D. Install and aim sensors in locations to achieve not less than 90-percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

E. Mount electrically held lighting contactors with elastomeric isolator pads to eliminate structure-borne vibration unless contactors are installed in an enclosure with factory-installed vibration isolators.

3.2 WIRING INSTALLATION

A. Wiring Method: Comply with Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables." Minimum conduit size is 1/2 inch.

B. Wiring within Enclosures: Separate power-limited and nonpower-limited conductors in accordance with conductor manufacturer's written instructions.

C. Size conductors in accordance with lighting control device manufacturer's written instructions unless otherwise indicated.

D. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.3 IDENTIFICATION

A. Identify components and power and control wiring in accordance with Section 26 05 53 "Identification for Electrical Systems."

B. Label time switches and contactors with a unique designation.

3.4 FIELD QUALITY CONTROL

A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
   1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
   2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Lighting control devices will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

3.5 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting lighting control devices to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.
   1. For occupancy and motion sensors, verify operation at outer limits of detector range. Set time delay to suit Owner's operations.
   2. For daylighting controls, adjust set points and deadband controls to suit Owner's operations.
   3. Align high-bay occupancy sensors using manufacturer's laser aiming tool.

3.6 SOFTWARE SERVICE AGREEMENT

A. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.

B. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.
   1. Upgrade Notice: At least 30 days to allow Owner to schedule and access the system and to upgrade computer equipment if necessary.

3.7 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices.

END OF SECTION

SECTION 26 28 16
ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Fusible switches.
   2. Nonfusible switches.
   3. Molded-case circuit breakers (MCCBs).
   4. Enclosures.

1.2 DEFINITIONS

A. NC: Normally closed.

B. NO: Normally open.

C. SPDT: Single pole, double throw.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated.

B. Shop Drawings: For enclosed switches and circuit breakers. Include plans, elevations, sections, details, and attachments to other work.
   1. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.6 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 FUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Eaton Electrical Sector; Eaton Corporation.
   2. General Electric Company.
   3. Siemens Industry, Inc.
   4. Square D.

B. Type GD, General Duty, Single Throw, 240-V ac, 800 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with cartridge fuse interiors to accommodate indicated fuses, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

C. Accessories:
   1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
   2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
   3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
   4. Lugs: Suitable for number, size, and conductor material.

2.2 NONFUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Eaton Electrical Sector; Eaton Corporation.
   2. General Electric Company.
   3. Siemens Industry, Inc.
   4. Square D.

B. Type GD, General Duty, Single Throw, 600 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

C. Accessories:
   1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
   2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
   3. Lugs: Suitable for number, size, and conductor material.

2.3 MOLDED-CASE CIRCUIT BREAKERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Eaton Electrical Sector; Eaton Corporation.
   2. General Electric Company.
   3. Siemens Industry, Inc.
   4. Square D.

B. General Requirements: Comply with UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents.

C. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

D. Electronic Trip Circuit Breakers: Field-replaceable rating plug, rms sensing, with the following field-adjustable settings:
   1. Instantaneous trip.
   2. Long- and short-time pickup levels.
   3. Long- and short-time time adjustments.
   4. Ground-fault pickup level, time delay, and I^2t response.

E. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller, and let-through ratings less than NEMA FU 1, RK-5.

F. Features and Accessories:
   1. Standard frame sizes, trip ratings, and number of poles.
   2. Lugs: Suitable for number, size, trip ratings, and conductor material.
   3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.
   4. Ground-Fault Protection: Comply with UL 1053; integrally mounted, self-powered type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
   5. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.

2.4 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
   1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
   2. Outdoor Locations: NEMA 250, Type 3R.

3. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
4. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.
5. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

C. Install fuses in fusible devices.

D. Comply with NECA 1.

3.2 IDENTIFICATION

A. Comply with requirements in Section 26 05 53 "Identification for Electrical Systems."
1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Acceptance Testing Preparation:
1. Test continuity of each circuit.

C. Tests and Inspections:
1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

END OF SECTION

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SECTION 26 52 19
EMERGENCY AND EXIT LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Emergency lighting units.
   2. Exit signs.
   3. Luminaire supports.

1.2 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color Rendering Index.

C. Emergency Lighting Unit: A lighting unit with integral or remote emergency battery powered supply and the means for controlling and charging the battery and unit operation.

D. Fixture: See "Luminaire" Paragraph.

E. Lumen: Measured output of lamp and luminaire, or both.

F. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of emergency lighting unit, exit sign, and emergency lighting support, arranged by designation.

B. Shop Drawings: For nonstandard or custom luminaires.
   1. Include plans, elevations, sections, and mounting and attachment details.
   2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   3. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, coordinated with each other, using input from installers of the items involved:

B. Product Certificates: For each type of luminaire.

C. Sample Warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.6 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Two year(s) from date of Substantial Completion.

B. Special Warranty for Emergency Lighting Batteries: Manufacturer's standard form in which manufacturer of battery-powered emergency lighting unit agrees to repair or replace components of rechargeable batteries that fail in materials or workmanship within specified warranty period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Cooper Lighting.
   2. Dual-Lite.

3. Hubbell Industrial Lighting; Hubbell Incorporated.
4. Lithonia Lighting; Acuity Brands Lighting, Inc.

B. Source Limitations: Obtain each type of light fixture and associated supports from single source from single manufacturer.

2.2 GENERAL REQUIREMENTS FOR EMERGENCY LIGHTING

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. NRTL Compliance: Fabricate and label emergency lighting units, exit signs, and batteries to comply with UL 924.

C. Comply with NFPA 70 and NFPA 101.

D. Comply with NEMA LE 4 for recessed luminaires.

E. Comply with UL 1598 for recessed luminaires.

F. Internal Type Emergency Power Unit: Self-contained, modular, battery-inverter unit, factory mounted within luminaire body and compatible with ballast.
1. Emergency Connection: Operate one lamp(s) continuously at an output of 1100 lumens each upon loss of normal power. Connect unswitched circuit to battery-inverter unit and switched circuit to fixture ballast.
2. Operation: Relay automatically turns lamp on when power-supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
3. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
   a. Ambient Temperature: Less than 0 deg F or exceeding 100 deg F, with an average value exceeding 95 deg F over a 24-hour period.
   b. Ambient Storage Temperature: Not less than minus 4 deg F and not exceeding 140 deg F.
   c. Humidity: More than 95 percent (condensing).
4. Test Push-Button and Indicator Light: Visible and accessible without opening fixture or entering ceiling space.
   a. Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
   b. Indicator Light: LED indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
5. Battery: Sealed, maintenance-free, lead-acid type.
6. Charger: Fully automatic, solid-state, constant-current type with sealed power transfer relay.
7. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.

G. External Type: Self-contained, modular, battery-inverter unit, suitable for powering one or more lamps, remote mounted from luminaire.
1. Emergency Connection: Operate one incandescent lamp continuously. Connect unswitched circuit to battery-inverter unit and switched circuit to luminaire.
2. Operation: Relay automatically turns lamp on when power-supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
3. Nightlight Connection: Operate lamp in a remote fixture continuously when indicated for such operation on plan.
4. Battery: Sealed, maintenance-free, lead-acid type.

5. Charger: Fully automatic, solid-state, constant-current type.
6. Housing: NEMA 250, Type 1 enclosure listed for installation inside, on top of, or remote from luminaire. Remote assembly shall be located no less than half the distance recommended by the emergency power unit manufacturer, whichever is less.
7. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
8. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
9. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.

2.3 EMERGENCY LIGHTING

A. General Requirements for Emergency Lighting Units: Self-contained units.

B. Emergency Luminaires:
1. Emergency Luminaires: as indicated on Drawings, with the following additional features:
   a. Operating at nominal voltage of 120 V ac.
   b. Internal emergency power unit.
   c. Rated for installation in damp locations, and for sealed and gasketed fixtures in wet locations.

C. Emergency Lighting Unit:
1. Emergency Lighting Unit: as indicated on Drawings.
2. Operating at nominal voltage of 6 V dc.
3. Wall with universal junction box adaptor.
4. UV stable thermoplastic housing, rated for damp locations.
5. One lamp head.
6. External emergency power unit.

2.4 EXIT SIGNS

A. Internally Lighted Signs:
1. Operating at nominal voltage of 120 V ac.
2. Lamps for AC Operation: LEDs; 50,000 hours minimum rated lamp life.
3. Self-Powered Exit Signs (Battery Type): Internal emergency power unit.

2.5 MATERIALS

A. Metal Parts:
1. Free of burrs and sharp corners and edges.
2. Sheet metal components shall be steel unless otherwise indicated.
3. Form and support to prevent warping and sagging.

B. Doors, Frames, and Other Internal Access:
1. Smooth operating, free of light leakage under operating conditions.
2. Designed to permit relamping without use of tools.
3. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

C. Diffusers and Globes:
1. Clear, UV-stabilized acrylic.
2. Acrylic: 100 percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
3. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

D. Housings:
1. Extruded aluminum housing.
2. Clear anodized finish.

E. Conduit: Electrical metallic tubing, minimum 3/4 inch in diameter.

2.6 METAL FINISHES

A. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 LUMINAIRE SUPPORT COMPONENTS

A. Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1.

B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.

C. Install lamps in each luminaire.

D. Supports:
   1. Sized and rated for luminaire and emergency power unit weight.
   2. Able to maintain luminaire position when testing emergency power unit.
   3. Provide support for luminaire and emergency power unit without causing deflection of ceiling or wall.
   4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire and emergency power unit weight and vertical force of 400 percent of fixture weight.

E. Wall-Mounted Luminaire Support:
   1. Attached to structural members in walls.
   2. Do not attach fixtures directly to gypsum board.

F. Suspended Luminaire Support:
   1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
   2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers. Support with approved outlet box and accessories that hold stem and provide damping of fixture oscillations. Support outlet box vertically to building structure using approved devices.
   3. Continuous Rows of Luminaires: Use tubing or stem for wiring at one point and wire support for suspension for each unit length of fixture chassis, including one at each end.
   4. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.

G. Ceiling Grid Mounted Luminaires:
   1. Secure to any required outlet box.
   2. Secure emergency power unit using approved fasteners in a minimum of four locations, spaced near corners of emergency power unit.

H. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

3.2 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
   1. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.

B. Luminaire will be considered defective if it does not pass operation tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION

SECTION 26 56 13
LIGHTING POLES AND STANDARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Poles and accessories for support of luminaires.

1.2 DEFINITIONS

A. EPA: Equivalent projected area.

B. Luminaire: Complete lighting fixture.

C. Pole: Luminaire-supporting structure, including tower used for large-area illumination.

D. Standard: See "Pole."

1.3 ACTION SUBMITTALS

A. Product Data: For each pole and accessory.

1.4 INFORMATIONAL SUBMITTALS

A. Pole and Support Component Certificates: Signed by manufacturers of poles, certifying that products are designed for indicated load requirements according to AASHTO LTS-6-M and that load imposed by luminaire and attachments has been included in design. The certification shall be based on design calculations signed and sealed by a professional engineer.

B. Material test reports.

C. Field quality-control reports.

D. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and maintenance data for pole-lowering devices and pole-mounted accessories.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of pole(s) that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar radiation within a specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs from special warranty period.
   1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Luminaire Attachment Provisions: Comply with luminaire manufacturers' mounting requirements. Use stainless-steel fasteners and mounting bolts unless otherwise indicated.

2.2 STEEL POLES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Cooper Lighting.
   2. H.E. Williams.
   3. Hubbell Incorporated.
   4. Lithonia Lighting; Acuity Brands Lighting, Inc.

B. Source Limitations: Obtain poles from single manufacturer or producer.

C. Poles: Comply with ASTM A 500/A 500M, Grade B carbon steel with a minimum yield of 46,000 psig; one-piece construction up to 40 feet in height with access handhole in pole wall.
   1. Shape: Square, straight.

2. Mounting Provisions: Butt flange for bolted mounting on foundation or breakaway support.

D. Pole-Top Tenons: Fabricated to support luminaire or luminaires and brackets indicated, and securely fastened to pole top.

E. Fasteners: Galvanized steel, size and type as determined by manufacturer. Corrosion-resistant items compatible with support components.
1. Materials: Compatible with poles and standards as well as the substrates to which poles and standards are fastened and shall not cause galvanic action at contact points.
2. Anchor Bolts, Leveling Nuts, Bolt Caps, and Washers: Hot-dip galvanized after fabrication unless otherwise indicated.

F. Grounding and Bonding Lugs: Welded 1/2-inch threaded lug, complying with requirements in Section 26 05 26 "Grounding and Bonding for Electrical Systems," listed for attaching grounding and bonding conductors of type and size indicated, and accessible through handhole.

G. Handhole: Oval shaped, with minimum clear opening of 2-1/2 by 5 inches, with cover secured by stainless-steel captive screws.

H. Powder-Coat Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying and designating finishes.
1. Surface Preparation: Clean surfaces according to SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair powder coat bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, according to SSPC-SP 5/NACE No. 1 or SSPC-SP 8.
2. Powder Coat: Comply with AAMA 2604.
a. Electrostatic-applied powder coating; single application and cured to a minimum 2.5- to 3.5-mils dry film thickness. Coat interior and exterior of pole for equal corrosion protection.

2.3 POLE ACCESSORIES

A. Base Covers: Manufacturers' standard metal units, finished same as pole, and arranged to cover pole's mounting bolts and nuts.

2.4 MOUNTING HARDWARE

A. Anchor Bolts: Manufactured to ASTM F 1554, Grade 55, with a minimum yield strength of 55,000 psi.
1. Galvanizing: Hot dip galvanized according to ASTM A 153, Class C.

B. Nuts: ASTM A 563, Grade A, Heavy-Hex
1. Galvanizing: Hot dip galvanized according to ASTM A 153, Class C.
2. Two nuts provided per anchor bolt.

C. Washers: ASTM F 436, Type 1.
1. Galvanizing: Hot dip galvanized according to ASTM A 153, Class C.
2. One washers provided per anchor bolt.

2.5 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 POLE FOUNDATION

A. Concrete Pole Foundations: Cast in place, with anchor bolts to match pole-base flange. Structural steel complying with ASTM A 36/A 36M and hot-dip galvanized according to ASTM A 123/A 123 M; and with top-plate and mounting bolts to match pole-base flange and

strength required to support pole, luminaire, and accessories. Concrete, reinforcement, and formwork are specified in Section 03 30 00 "Cast-in-Place Concrete."

B. Anchor Bolts: Install plumb using manufacturer-supplied template, uniformly spaced.

3.2 POLE INSTALLATION

A. Concrete Pole Foundations: Set anchor bolts according to anchor-bolt templates furnished by pole manufacturer. Concrete materials, installation, and finishing requirements are specified in Section 03 30 00 "Cast-in-Place Concrete."

B. Raise and set pole using web fabric slings (not chain or cable) at locations indicated by manufacturer.

3.3 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum using insulating fittings or treatment.

B. Steel Conduits: Comply with requirements in Section 26 05 33 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch- thick, pipe-wrapping plastic tape applied with a 50-percent overlap.

3.4 GROUNDING

A. Ground Metal Poles and Support Structures: Comply with requirements in Section 26 05 26 "Grounding and Bonding for Electrical Systems."
   1. Install grounding electrode for each pole unless otherwise indicated.
   2. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.

END OF SECTION

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SECTION 26 56 19
LED EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Exterior solid-state luminaires that are designed for and exclusively use LED lamp technology.
   2. Luminaire supports.
   3. Luminaire-mounted photoelectric relays.

B. Related Requirements:
   1. Section 26 56 13 "Lighting Poles and Standards" for poles and standards used to support exterior lighting equipment.

1.2 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color rendering index.

C. Fixture: See "Luminaire."

D. IP: International Protection or Ingress Protection Rating

E. Lumen: Measured output of lamp and luminaire, or both.

F. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of luminaire.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans, drawn to scale and coordinated.

B. Product Certificates: For each type of the following:
   1. Luminaire.
   2. Photoelectric relay.

C. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.
   1. Provide a list of all lamp types used on Project. Use ANSI and manufacturers' codes.
   2. Provide a list of all photoelectric relay types used on Project; use manufacturers' codes.

1.6 FIELD CONDITIONS

A. Mark locations of exterior luminaires for approval by Architect prior to the start of luminaire installation.

1.7 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: 2 year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. NRTL Compliance: Luminaires shall be listed and labeled for indicated class and division of hazard by an NRTL.

C. UL Compliance: Comply with UL 1598 and listed for wet location.

D. Lamp base complying with ANSI C81.61.

E. CRI of minimum 80. CCT of 4000 K.

F. Maintained minimum 90 percent of initial lumen output at lamp life of 50,000 hours.

G. Nominal Operating Voltage: 208 V ac.

H. Lamp Rating: Lamp marked for outdoor use.

I. Source Limitations: Obtain luminaires from single source from a single manufacturer.

2.2 MATERIALS

A. Metal Parts: Free of burrs and sharp corners and edges.

B. Sheet Metal Components: Corrosion-resistant aluminum. Form and support to prevent warping and sagging.

C. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses.

D. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:
   1. White Surfaces: 85 percent.
   2. Specular Surfaces: 83 percent.
   3. Diffusing Specular Surfaces: 75 percent.

E. Housings:
   1. Rigidly formed, weather- and light-tight enclosure that will not warp, sag, or deform in use.
   2. Provide filter/breather for enclosed luminaires.

2.3 FINISHES

A. Variations in Finishes: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

B. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

C. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
   1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
   2. Class I, Color-Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker), complying with AAMA 611.
      a. Color: Dark bronze.

2.4 LUMINAIRE SUPPORT COMPONENTS

A. Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

A. Comply with NECA 1.

B. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.

C. Install lamps in each luminaire.

D. Fasten luminaire to structural support.

E. Supports:
   1. Sized and rated for luminaire weight.
   2. Able to maintain luminaire position after cleaning and relamping.
   3. Support luminaires without causing deflection of finished surface.
   4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.

F. Wall-Mounted Luminaire Support:
   1. Attached to structural members in walls.

G. Wiring Method: Install cables in raceways. Conceal raceways and cables.

H. Install luminaires level, plumb, and square with finished grade unless otherwise indicated.

I. Coordinate layout and installation of luminaires with other construction.

J. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables" and 260533 "Raceways and Boxes for Electrical Systems" for wiring connections and wiring methods.

3.2 INSTALLATION OF INDIVIDUAL GROUND-MOUNTED LUMINAIRES

A. Aim as indicated on Drawings.

B. Install on concrete base with top 4 inches above finished grade or surface at luminaire location. Cast conduit into base, and finish by troweling and rubbing smooth. Concrete materials, installation, and finishing are specified in Section 03 30 00 "Cast-in-Place Concrete."

3.3 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

B. Steel Conduits: Comply with Section 26 05 33 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch-thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.4 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

3.5 FIELD QUALITY CONTROL

A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.

B. Perform the following tests and inspections:
   1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
   2. Verify operation of photoelectric controls.

C. Illumination Tests:
   1. Measure light intensities at night. Use photometers with calibration referenced to NIST standards. Comply with the following IES testing guide(s):
      a. IES LM-5.
      b. IES LM-64.
   2. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.

D. Luminaire will be considered defective if it does not pass tests and inspections.

E. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.6 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain luminaires and photocell relays.

END OF SECTION

SECTION 31 10 00
SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing, and abandoning site utilities in place.
7. Temporary erosion and sedimentation control.

1.3 DEFINITIONS

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

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

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects larger than 2 inches in diameter; and free of weeds, roots, toxic materials, or other nonsoil materials.

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

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

1.4 MATERIAL OWNERSHIP

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

1.5 SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, public roadway, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing or other construction. Documentation area shall include all onsite area and a minimum of 40 feet into public right-of-way or beyond the grading limits on all sides.

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

B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

C. Manufacturer information for tree protection and erosion and sediment control items, such as sediment logs, silt fence, tree protection fence or signage, etc.

1.6 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: No improvements or work on adjacent private property are necessary.

1. Obtain all permitting required for work in adjacent public right-of-way from that governing authority.

C. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises.

D. Utility Locator Service: Notify Missouri One Call for area where Project is located before site clearing.

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

F. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

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

B. Verify that trees, shrubs, and other vegetation to remain and that protection zones have been identified and enclosed in accordance with the plans.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

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

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

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

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

3.3 TREE AND PLANT PROTECTION

A. Protect trees and plants remaining on-site in accordance with the plans.

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

3.4 EXISTING UTILITIES

A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.

1. Arrange with utility companies to shut off indicated utilities.

B. Locate, identify, and disconnect utilities indicated to be abandoned in place.

C. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner's written permission.

D. Excavate for and remove underground utilities indicated to be removed.

E. Removal of underground utilities is included in earthwork sections; in applicable fire suppression, plumbing, HVAC, electrical, communications, electronic safety and security, and utilities sections; and in Section 024116 "Structure Demolition" and Section 024119 "Selective Demolition."

3.5 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. For all trees, shrubs, or other woody vegetation indicated to be removed, remove the entire stump and associated root ball and roots.
3. Remove all organic material offsite, except for topsoil.
4. Chip removed tree branches and remove offsite.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to depth 6 inches (average) in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

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

1. Limit height of topsoil stockpiles in accordance with City of Columbia requirements.
2. Do not stockpile topsoil within protection zones.
3. Stockpile surplus topsoil to allow for respreading deeper topsoil.
4. Dispose of surplus topsoil on-site if quantities exceed respreading deeper topsoil areas, in areas coordinated with the Owner.
5. Do not remove topsoil offsite.

3.7 SITE IMPROVEMENTS

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

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

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

END OF SECTION 31 10 00

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SECTION 31 20 00
EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for slabs-on-grade, walks, pavements, turf and grasses, and plants.
3. Excavating and backfilling for buildings and structures.
4. Subbase course for concrete walks, and pavements.
5. Subbase course and base course for asphalt paving.
6. Subsurface drainage backfill for walls and trenches.
7. Excavating and backfilling trenches for utilities and pits for buried utility structures.

B. Related Requirements:

1. Section 311000 "Site Clearing" for site stripping, grubbing, stripping, and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
2. Section 329200 "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.

1.3 DEFINITIONS

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

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

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

E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Owner. Authorized additional excavation and

replacement material will be paid for according to Contract provisions for changes in the Work.

2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Owner. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

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

G. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. (0.57 cu. m) or more in volume that exceed a standard penetration resistance of 100 blows/2 inches (97 blows/50 mm) when tested by the project geotechnical testing agency, according to ASTM D 1586.

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

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

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

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

1.4 SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Warning tapes.

B. Samples for Verification: For the following products, in sizes indicated below:

1. Warning Tape: 12 inches (300 mm) long; of each color.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to [ASTM D 698] [ASTM D 1557].

C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving begins.

1.6 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: No improvements or work on adjacent private property are necessary.

1. Obtain all permitting required for work in adjacent public right-of-way from that governing authority.

C. Utility Locator Service: Notify “Missouri One Call” for area where Project is located before beginning earth-moving operations.

D. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified in the Civil Plans, project SWPPP, and Section 311000 "Site Clearing" are in place.

1.7 SITE BALANCE

A. Project shall be constructed to the grades and elevations shown in the project plans. Include any and all haul in or haul off of materials necessary to construct the project to these plans and elevations.

1. Include temporary storage and delayed hauling because of site constraints, construction staging, and construction schedule.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups GW, GM, GC, SW, SP, SM, SC, and CL according to ASTM D 2487 or a combination of these groups; free of rock or gravel larger than 8 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. Soils that classify as CH should be analyzed and approved by a qualified geotechnical engineer prior to use.

C. Unsatisfactory Soils: Soil Classification Groups OL, MH, OH, and PT according to ASTM D 2487 or a combination of these groups and low density, low strength, pumping, rutted soils.

1. Unsatisfactory soils also include satisfactory soils not maintained within optimum moisture content allowances, at time of compaction.
2. Soils that fail proof roll tests.

D. Subbase Material: Subbase material shall meet the crushed stone base MoDOT requirements of Section 1007 of the current Missouri Standards for Highway Construction, Type 5.

E. Engineered Fill: Soil or granular fill containing sufficient fines to establish a moisture/density relationship.

F. Bedding Course: Per ASTM C33 #67 or approved equal.

2.2 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

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

B. Protect and maintain erosion and sedimentation controls during earth-moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; and soil, boulders, and other materials not classified as rock or unauthorized excavation.

a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: 6 inches (300 mm) each side of pipe or conduit, or as indicated on the drawings.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
1. Excavate trenches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trench Bottoms: Excavate trenches 4 inches (100 mm) deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

E. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

3.8 SUBGRADE INSPECTION

A. Notify Owner when excavations have reached required subgrade.

B. If Owner determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes) to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction. Limit vehicle speed to 3 mph (5 km/h).
2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Owner, and replace with compacted backfill or fill as directed.

D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Owner, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by the Owner.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Owner.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
2. Soil material that is not intended to be used elsewhere onsite shall be removed from the site within 2 weeks of excavation.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

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

3.12 UTILITY TRENCH BACKFILL

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

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Footings: Backfill trenches excavated under footings with lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa).

D. Trenches under Vehicular Pavement: Place and compact backfill of Subbase material to the bottom of the roadway pavement and a minimum 1 foot beyond edge of pavement in all directions.

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

F. Place and compact initial backfill of engineered fill, free of particles larger than 1 inch (25 mm) in any dimension, to a height of 12 inches (300 mm) over the pipe or conduit.

a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

G. Warning Tape: Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.13 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use satisfactory soil material.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.14 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within -2 to +4 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by +4 percent and is too wet to compact to specified dry unit weight.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

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

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:

1. Under building slabs, compact each layer of backfill or fill soil material at least 95 percent.
2. Under walkways, structures, steps, and pavements, compact each layer of backfill or fill soil material at least 95 percent.
3. Under natural grass turf or landscaped areas, compact each layer of backfill or fill soil material at least 95 percent to achieve bottom topsoil layer elevation, topsoil surface material shall be compacted to at least 80 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at least 95 percent.

3.16 GRADING

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

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch (25 mm).
2. Walks: Plus or minus 1/2 inch (13 mm).
3. Pavements: Plus or minus 1/2 inch (13 mm).

3.17 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

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

B. On prepared subgrade, place subbase course under pavements and walks as follows:

1. Shape subbase course to required crown elevations and cross-slope grades.
2. Place subbase course 6 inches (150 mm) or less in compacted thickness in a single layer.
3. Place subbase course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
4. Compact subbase course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.18 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

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

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place drainage course 6 inches (150 mm) or less in compacted thickness in a single layer.
3. Place drainage course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.19 FIELD QUALITY CONTROL

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

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

C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Tests will be performed at the following locations and frequencies:

1. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length but no fewer than two tests.
2. Paved areas, sidewalks, and other potential structural areas: At each compacted backfill layer, at least one test for every 3,600 square feet, but in no case fewer than 3 tests per lift.

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

3.20 PROTECTION

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

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

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

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

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

3.21 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove demolished improvements, surplus satisfactory soil and waste materials, including unsatisfactory soil for fill placement, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 31 20 00

SECTION 32 12 16
ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Hot-mix asphalt paving.
2. Asphalt surface treatments.

1.3 DEFINITION

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

1. Job-Mix Designs: For each job mix proposed for the Work.

B. Qualification Data: For qualified manufacturer and Installer.

C. Material Certificates: For each paving material, from manufacturer.

D. Material Test Reports: For each paving material.

E. Wheel Stops: Manufacturer information including intended installation procedure.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the current MoDOT Standard Specifications for Highway Construction for asphalt paving work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Prime Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
2. Tack Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
4. Asphalt Base Course: Minimum surface temperature of 40 deg F (4.4 deg C) and rising at time of placement.
5. Asphalt Surface Course: Minimum surface temperature of 60 deg F (15.6 deg C) at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

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

B. Type 5 Aggregate: Per the current MoDOT Standard Specifications for Highway Construction.

2.2 ASPHALT MATERIALS

A. All asphalt material shall conform to the current MoDOT Standard Specifications for Highway Construction.

B. Water: Potable.

2.3 AUXILIARY MATERIALS

A. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.

B. Sand: ASTM D 1073 or AASHTO M 29, Grade Nos. 2 or 3.

2.4 MIXES

A. Hot-Mix Asphalt: Per the current MoDOT Standard Specifications for Highway Construction.

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction. Limit vehicle speed to 3 mph (5 km/h).
2. Proof roll with a pneumatic tired loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Owner, and replace with compacted backfill or fill as directed.

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

D. Verify that utilities, traffic loop detectors, and other items requiring a cut and installation beneath the asphalt surface have been completed and that asphalt surface has been repaired flush with adjacent asphalt prior to beginning installation of imprinted asphalt.

3.2 SURFACE PREPARATION

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

B. Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.20 gal./sq. yd. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure.

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

C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.3 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place hot-mix asphalt base course per current MoDOT Standard Specifications for Highway Construction.

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

3.4 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

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

3.5 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).

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

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Minimum Asphaltic Course Density: At least 98 percent of reference laboratory density according to ASTM D 6927.
2. Minimum Bituminous Course Density: At least 95 percent of reference lab density according to ASTM D 6927.

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

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

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

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

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

3.6 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch (13 mm).
2. Surface Course: Plus 1/4 inch (6 mm), no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot (3-m) straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4 inch (6 mm).
2. Surface Course: 1/8 inch (3 mm).
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch (6 mm).

C. The paving tolerances noted above do not control in regards to site accessibility, and providing accessible routes in accordance with the American with Disabilities Act of 1990 and the 2010 ADA Standards for Accessible Design. Accessible routes shall meet the following:

1. Sidewalks shall not exceed 5% (1'-0" in 20'-0") slope with a 2% (1'-0" in 50'-0") cross-slope and shall be 5' wide except as noted on site plan.
2. Parking areas for accessible spaces and access isles shall not exceed a 2% (1'-0" in 50'-0") in any direction.
3. Ramps shall not exceed 8.33% (1'-0" in 12'-0") slope with a 2% (1'-0" in 50'-0") cross-slope and shall be 5' wide except as noted on site layout plan.
4. All sidewalk intersections shall have a 5' x 5' landing at 1/4" per 1' max slope in all directions.

3.7 FIELD QUALITY CONTROL

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

B. Field testing, frequency, and methods may vary as determined by and between the Owner and the Owner's Testing Agency.

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

D. Asphaltic surface and base courses shall be randomly cored at a minimum rate of 1 core per 10,000 square feet of paving, but not less than 3 cores in light duty areas and 3 cores in heavy-duty areas shall be obtained. Asphaltic concrete pavement samples shall be tested for conformance with mix design.

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

F. Thickness Test: Measure thickness of each core sample taken. The thickness of the course or the combined courses shall meet or exceed the indicated thickness. Where the deficiency exists,

remove the affected pavement area and replace it with new pavement or, at discretion of Owner, correct deficient paving thickness with tack coat and minimum 1-in overlay.

G. Field density test for in-place materials:

1. Density test shall be conducted on each core sample taken in accordance with ASTM D1188 or D2726 as applicable.
2. In-place density tests by nuclear method in accordance with ASTM D2950 shall also be taken as necessary to assure the specified density is obtained. Nuclear density shall be correlated with ASTM D1188 or D2726.

H. Check all pavement for ponding area. Correct all areas to drain via method acceptable by Owner.

I. Remove and replace unacceptable areas as directed by Owner.

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

3.8 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow milled materials to accumulate on-site.

END OF SECTION 32 12 16

SECTION 32 13 13
CONCRETE PAVING

PART 1 - **GENERAL**

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Driveways.
2. Roadways.
3. Parking lots.
4. Curbs and gutters.
5. Walks.

1.3 DEFINITIONS

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

1.4 SUBMITTALS

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

B. Other Action Submittals:

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

C. Qualification Data: For qualified ready-mix concrete manufacturer and testing agency.

D. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Welded wire fabric.
4. Admixtures.
5. Curing compounds.
6. Applied finish materials.
7. Joint fillers.

E. Material Test Reports: For each of the following:

1. Aggregates.

F. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

B. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field-Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

C. ACI Publications: Comply with ACI 301 (ACI 301M) unless otherwise indicated.

1.6 PROJECT CONDITIONS

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

PART 2 - PRODUCTS

2.1 FORMS

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

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet (30.5 m) or less. Do not use notched and bent forms.

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

2.2 STEEL REINFORCEMENT

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

B. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420) plain-steel bars. Cut bars true to length with ends square and free of burrs.

2.3 CONCRETE MATERIALS

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

1. Portland Cement: ASTM C150, Type I or II Portland cement.

B. Normal-Weight Aggregates: ASTM C33, uniformly graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 3/4 inch (19 mm) nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

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

D. Air-Entraining Admixture: ASTM C 260.

E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.4 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Axim Italcementi Group, Inc.; Caltexol CIMFILM.
b. BASF Construction Chemicals, LLC; Confilm.
c. ChemMasters; Spray-Film.
d. Conspec by Dayton Superior; Aquafilm.
e. Dayton Superior Corporation; Sure Film (J-74).
f. Edoco by Dayton Superior; BurkeFilm.
g. Euclid Chemical Company (The), an RPM company; Eucobar.
h. Kaufman Products, Inc.; VaporAid.
i. Lambert Corporation; LAMBCO Skin.
j. L&M Construction Chemicals, Inc.; E-CON.
k. Meadows, W. R., Inc.; EVAPRE.

l. Metalcrete Industries; Waterhold.
m. Nox-Crete Products Group; MONOFILM.
n. Sika Corporation, Inc.; SikaFilm.
o. SpecChem, LLC; Spec Film.
p. Symons by Dayton Superior; Finishing Aid.
q. TK Products, Division of Sierra Corporation; TK-2120 TRI-FILM.
r. Unitex; PRO-FILM.
s. Vexcon Chemicals Inc.; Certi-Vex EnvioAssist.

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

1. Available Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Anti-Hydro International, Inc.; A-H Curing Compound #2 DR WB.
b. ChemMasters; Safe-Cure Clear.
c. Dayton Superior Corporation; Day-Chem Rez Cure (J-11-W).
d. Euclid Chemical Company (The), an RPM company; Kurez W VOX.
e. Kaufman Products, Inc.; Thinfilm 420.
f. Lambert Corporation; AQUA KURE - CLEAR.
g. L&M Construction Chemicals, Inc.; L&M CURE R.
h. Meadows, W. R., Inc.; 1100-CLEAR SERIES.
i. Nox-Crete Products Group; Resin Cure E.
j. SpecChem, LLC; PaveCure Rez.
k. Symons by Dayton Superior; Resi-Chem Clear.
l. Tamms Industries, Inc., Euclid Chemical Company (The); TAMMSCURE WB 30C.
m. Vexcon Chemicals Inc.; Certi-Vex Enviocure 100.

2.5 RELATED MATERIALS

A. Joint Fillers: Resilient premolded bituminous impregnated fiberboard units complying with ASTM D994, D1751, D2628; FS HH-F-341, Type II Class A.

B. Joint Sealants: ASTM C920, non-priming, pourable, self-leveling polyurethane.

C. Water repellent and chloride screen: Prosoco Saltguard WB or approved equal.

2.6 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301 (ACI 301M), for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that meet or exceed requirements.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): 4000 psi (27.6 MPa).
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.

3. Slump Limit: 4 inches (100 mm), plus or minus 1 inch (25 mm).

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

1. Air Content: 6 percent plus or minus 1.5 percent for 3/4-inch (19-mm) nominal maximum aggregate size.

D. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use plasticizing and retarding admixture in concrete as required for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

E. Cementitious Materials: Limit percentage by weight of cementitious materials other than portland cement according to ACI 301 (ACI 301M) requirements for concrete exposed to deicing chemicals.

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction. Limit vehicle speed to 3 mph (5 km/h).
2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch (13 mm) according to requirements in Division 31 Section "Earth Moving."

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

3.2 PREPARATION

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

3.3 EDGE FORMS AND SCREED CONSTRUCTION

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

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

3.4 STEEL REINFORCEMENT

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

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

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

D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 JOINTS

A. General: Form expansion, sawed or premolded strip, and keyed construction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.
2. Install as indicated in the project civil plans.

B. Keyed Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Construct joints in accordance with details as shown in Plans.

C. Expansion Joints: Locate expansion joints as shown and detailed in the civil plans and as follows:

1. Locate expansion joints at intervals of 150 feet maximum each way unless otherwise indicated.
2. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Sawed or Premolded Strip Joints: Provide a joint plan for approval by Owner. Joint spacing shall not exceed 15 feet maximum. Panels shall be cut such that panels are nearly square and do not exceed 1.4 length to width ratio.

1. Construct joints for depth equal to at least 1/3 of the concrete thickness.
2. Sawed Joints: Form joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/8-inch (3-mm) radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

F. Joint Fillers: Extend joint filler full-width and depth of joint, and not less than ½-inch or more than 1-inch below finished surface where joint sealer is indicated. Furnish joint filler in 1-piece lengths for full width being placed, wherever possible. Where more than 1 length is required, lace or clip joint filler sections together.

G. Joint sealants: Joints shall be sealed with approved exterior pavement joint sealants and shall be installed in accordance with manufacturer's recommendations.

3.6 CONCRETE PLACEMENT

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

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

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

D. Comply with ACI 301 (ACI 301M) requirements for measuring, mixing, transporting, and placing concrete.

E. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

F. Consolidate concrete according to ACI 301 (ACI 301M) by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating dowels and joint devices.

G. Screed paving surface with a straightedge and strike off.

H. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

I. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.

J. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

K. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306R-10 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

L. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared, and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

3.8 CONCRETE PROTECTION AND CURING

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

B. Comply with ACI 306R-10 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

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

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

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

F. Apply water repellent and chloride screen Prosoco Saltguard WB as directed by manufacturer to the following locations:

1. New sidewalks and accessible ramps.
2. New concrete landings, stairs, and patios at exterior doors.

3.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 3/4 inch (19 mm).
2. Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm).
3. Surface: Gap below 10-foot- (3-m-) long, unleveled straightedge not to exceed 1/2 inch (13 mm).
4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches (13 mm per 300 mm) of tie bar.
5. Lateral Alignment and Spacing of Dowels: 1 inch (25 mm).
6. Vertical Alignment of Dowels: 1/4 inch (6 mm).
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches (6 mm per 300 mm) of dowel.
8. Joint Spacing: 3 inches (75 mm).
9. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
10. Joint Width: Plus 1/8 inch (3 mm), no minus.

B. The paving tolerances noted above do not control in regard to site accessibility, and providing accessible routes in accordance with the American with Disabilities Act of 1990 and the 2010 ADA Standards for Accessible Design. Accessible routes shall meet the following:

1. Sidewalks shall not exceed 5% (1'-0" in 20'-0") slope with a 2% (1'-0" in 50'-0") cross-slope.

2. Parking areas for accessible spaces and access isles shall not exceed a 2% (1'-0" in 50'-0") slope in any direction.
3. Ramps shall not exceed 8.33% (1'-0" in 12'-0") slope with a 2% (1'-0" in 50'-0") cross-slope.

4. All sidewalk intersections shall have a 5' x 5' landing with a 2% (1/4" in 1') max slope in all directions.

3.10 FIELD QUALITY CONTROL

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

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

1. Testing Frequency: Obtain at least one composite sample for each 50 cu. yd. (38 cu. m) or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when it is 80 deg F (27 deg C) and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of four standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days, two specimens at 28 days and hold one specimen in reserve for future testing, if needed.

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

C. Strength of each concrete mixture will be satisfactory if average of any three-consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).

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

E. Nondestructive Testing: Sonoscope or other nondestructive device may be permitted by Owner but will not be used as sole basis for approval or rejection of concrete.

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

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

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

I. Prepare test and inspection reports.

3.11 REPAIRS AND PROTECTION

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

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

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

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

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SECTION 32 13 73
CONCRETE PAVING JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Cold-applied joint sealants.

B. Related Sections:
1. Division 32 Section "Asphalt Paving" for constructing joints between concrete and asphalt pavement.
2. Division 32 Section "Concrete Paving" for constructing joints in concrete pavement.

1.3 PRECONSTRUCTION TESTING

A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, Samples of materials that will contact or affect joint sealants.

1. Use manufacturer's standard test method to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit no fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
5. Testing will not be required if joint-sealant manufacturers submit joint-preparation data that are based on previous testing, not older than 24 months, of sealant products for compatibility with and adhesion to joint substrates and other materials matching those submitted.

1.4 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Pavement-Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

C. Qualification Data: For qualified Installer.

D. Product Certificates: For each type of joint sealant and accessory, from manufacturer.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for joint sealants.

F. Preconstruction Compatibility and Adhesion Test Reports: From joint-sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility with and adhesion to joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each type of joint sealant from single source from single manufacturer.

C. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.6 PROJECT CONDITIONS

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

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

B. Colors of Exposed Joint Sealants: Concrete gray.

2.2 COLD-APPLIED JOINT SEALANTS

A. Single-Component, Nonsag, Silicone Joint Sealant for Concrete: ASTM D 5893, Type NS.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Crafco Inc., an ERGON company; RoadSaver Silicone.
b. Dow Corning Corporation; 888.
c. Pecora Corporation; 301 NS.

B. Single-Component, Self-Leveling, Silicone Joint Sealant for Concrete: ASTM D 5893, Type SL.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Crafco Inc., an ERGON company; RoadSaver Silicone SL.
b. Dow Corning Corporation; 890-SL.
c. Pecora Corporation; 300 SL.

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

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Pecora Corporation; Urexpan NR-200.

2.3 JOINT-SEALANT BACKER MATERIALS

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

B. Round Backer Rods for Cold-Applied Joint Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

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

D. Backer Strips for Cold-Applied Joint Sealants: ASTM D 5249; Type 2; of thickness and width required to control joint-sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

2.4 PRIMERS

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

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

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

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

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

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.

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

C. Install joint-sealant backings of kind indicated to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of joint-sealant backings.
2. Do not stretch, twist, puncture, or tear joint-sealant backings.
3. Remove absorbent joint-sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install joint sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place joint sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants according to the following requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:

1. Remove excess joint sealant from surfaces adjacent to joints.

2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.

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

3.4 CLEANING

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

3.5 PROTECTION

A. Protect joint sealants, during and after curing period, from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations in repaired areas are indistinguishable from the original work.

3.6 PAVEMENT-JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Joints within cement concrete pavement.

1. Joint Location:

    a. Expansion and isolation joints in cast-in-place concrete pavement.
    b. Contraction joints in cast-in-place concrete slabs.
    c. Other joints as indicated.

2. Silicone Joint Sealant for Concrete: Single component, self-leveling.
3. Urethane Joint Sealant for Concrete: Multicomponent, pourable, traffic-grade.
4. Joint-Sealant Color: Concrete gray.

END OF SECTION 32 13 73

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SECTION 32 13 80
PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Painting and marking of pavements and curbs.

1.2 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials (AASHTO)

1. AASHTO M248 - Ready-Mixed White and Yellow Traffic Paints.
2. Current Missouri Department of Transportation (MoDOT) Standard Specifications for Highway Construction.

B. ASTM International (ASTM)

1. ASTM D4414 - Standard Practice for Measurement of Wet Film Thickness by Notched Gauges.

C. Federal Specifications (FS)

1. FS TT-P-1952 - Paint, Traffic and Airfield Marking, Waterborne.

1.3 SUBMITTALS

A. Product Data: For each pavement marking product. Include technical data and tested physical and performance properties.

1.4 PROJECT CONDITIONS

A. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize flagmen, barricades, warning signs, and warning lights as required.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 55 deg F (12.8 deg C), and not exceeding 95 deg F (35 deg C).

1.5 QUALITY ASSURANCE

A. Use trained and experienced personnel in applying the products and operating the equipment required for properly performed work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Unless noted otherwise in the Civil plans, paint shall be acrylic waterborne paint specifically indicated for pavement marking applications, colors as shown or specified herein. Pavement marking paints shall comply with applicable state and local laws enacted to ensure compliance with Federal Clean Air Standards. Paint materials shall conform to the restrictions of the local Air Pollution Control District.

B. Acrylic waterborne paint shall be capable of receiving and holding glass beads for producing retroreflective pavement marking.

C. Waterborne Paint: Paints shall conform to FS TT-P-1952,

D. Retroreflective paint shall be standard waterborne paint with Type L glass beads per Section 620 of the current MoDOT Standard Specifications for Highway Construction. It shall meet all retroreflective requirements of current MoDOT Standard Specifications for Highway Construction.

E. All pavement marking paint for this project shall be retroreflective.

F. All pavement marking paint shall meet current MoDOT Standard Specifications for Highway Construction.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the work area and correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Sweep and clean surface to eliminate loose material and dust.

B. New pavement surfaces shall be allowed to cure for not less than 30 days before application of marking materials.

C. The surface on which pavement marking is to be applied shall be clean, dry, and free of all debris, laitance, curing compound and any other contaminants that my hinder the adhesion of the system to the surface. Pavement marking shall not be applied in damp conditions or if there is any evidence of surface moisture on the pavement.

3.3 APPLICATION

A. All pavement marking shall be uniform in appearance with crisp, we-defined edges and shall be uniform in width and thickness. Surface distribution of the beads shall be uniform.

B. Apply two coats of paint at manufacturer's recommended rate, without addition of thinner, with maximum of 100 square feet per gallon or as required by manufacturer to provide a minimum wet film thickness of 15 mils and dry film thickness of 7 ½ mils per coat. Paint shall be applied for a total dry film thickness of 15 mils. Apply with mechanical equipment to produce uniform straight edges. At sidewalk curbs and crosswalks, use straightedge to ensure uniform, clean, and straight stripe.

C. Install pavement markings according to manufacturer's recommended procedures for the specified material.

D. Following items shall be painted with colors noted below:

1. Pedestrian Crosswalks: White or as indicated in the Civil plans
2. Fire Lanes: Red if curbs are indicated to be marked in Civil plans.
3. Lane Striping where separating traffic moving in opposite directions: Yellow
4. Lane Striping where separating traffic moving in the same direction: White
5. ADA Symbols: Blue
6. ADA parking space markings: Blue as shown on the Civil Construction Plans.
7. Parking Stall Striping: Yellow
8. Parking lot arrows and text: Yellow
9. Other areas as indicated in the Civil plans.

E. See the Civil Site Plans for additional striping colors.

3.4 FIELD QUALITY CONTROL

A. Inspection: After the paint has thoroughly dried, visually inspect the entire application and touch up as required to provide clean, straight lines and surfaces throughout.

3.5 CLEANING

A. Waste materials shall be removed at the end of each workday. Upon completion of the work, all containers and debris shall be removed from the site. Paint spots upon adjacent surfaces shall be carefully removed by approved procedures that will not damage the surfaces and the entire job left clean and acceptable.

END OF SECTION 32 13 80

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SECTION 32 92 00 - TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Hydroseeding.
2. Sodding.

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

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

C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

D. Planting Soil: Existing, on-site topsoil meeting the definition in Section 31 10 00 Site Clearing, stockpiled during grading operations and not heavy compacted.

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

1.4 REQUIRED SUBMITTALS

A. Qualification Data: For landscape Installer.

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for turfgrass sod. Include identification and location of source and name and telephone number of supplier.

C. Product Certificates: For fertilizers, from manufacturer.

D. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

E. Product specifications and certifications for Hydroseed. Include identification and location of source and name and telephone number of supplier.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of turf during a calendar year.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf establishment.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience: Three years' experience in turf installation in addition to requirements in Section 014000 "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Pesticide Applicator: State licensed, commercial.

1.7 DELIVERY, STORAGE, AND HANDLING

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

B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.

C. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

1.8 FIELD CONDITIONS

A. Planting Restrictions: Plant during one of the following periods:

1. Spring Planting: March 15 to May 15.
2. Fall Planting: September 1 to October 20.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 TURFGRASS SOD

A. Turf grass Sod: Furnish viable sod of uniform density, color, and texture that is strongly rooted and capable of vigorous growth and development when planted.

B. Turf grass Species: Sod of grass species as follows, with not less than 95 percent germination, not less than 95 percent pure seed, and not more than 0.5 percent weed seed:

1. Sun and Partial Shade: Proportioned by weight as follows:

a. 70 percent tall turf type fescue cultivars (Festuca arundinacea variety).
b. 10 percent chewings red fescue (Festuca rubra variety).
c. 10 percent perennial ryegrass (Lolium perenne).
d. 10 percent redtop (Agrostis alba).

2.2 FERTILIZERS

A. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

2.3 HYDROSEEDING

A. Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide Seed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified.

B. Hydraulic Mulch: HydraCM matrix by North American Green or approved equal. See Appendix for product specification.

C. Permanent Grass Seed Mix: Proportioned by weight as follows:

1. 85 percent tall turf type fescue cultivars (Festuca arundinacea variety).
2. 15 percent perennial ryegrass (Lolium perenne).

2.4 PESTICIDES

A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
3. Uniformly moisten excessively dry soil that is not workable or which is dusty.

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

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas, structures, pavement pads, etc. from hydroseeding overspray.
2. Protect grade stakes set by others until directed to remove them.

3.3 TURF AREA PREPARATION

A. Placing Planting Soil: To thickness and grades indicated in civil plans. Provide light compaction only per Section 31 20 00 Earth Moving.

1. Reduce elevation of planting soil to allow for soil thickness of sod.

B. Kill and remove all existing weeds.

C. Verify all areas match the grading plan in the civil plans and provide positive drainage as intended in the plans.

D. Rake all areas smooth with no bumps, depressions, voids, rills, or eroded areas deeper than ½ inch.

E. Remove all objects on the surface (typically rocks, roots, trash, broken concrete, etc.) larger than 2” in any dimension. Fill depressions left with topsoil and rake smooth.

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

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

H. Place fertilizer at a rate of 7 lbs/1000 sq. ft. or as recommended by manufacturer.

3.4 HYDROSEEDING

A. Hydroseeding: Mix specified permanent grass seed mix, temporary grass seed mix, and HydraCM per manufacturer's written requirements Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Permanent grass seed mix shall be mixed so 215 lb/acre is applied.
2. Temporary seed mix shall be mixed so 10 lb/acre is applied.
3. Spray-apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that HydraCM component is deposited at not less than 3000-lb/acre dry weight.

3.5 SODDING

A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to soil or sod during installation. Tamp and roll lightly to ensure contact with soil, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

C. Saturate sod with fine water spray within two hours of planting. For the next two weeks after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches (38 mm) below sod.

3.6 TURF MAINTENANCE

A. Protection: Protect the area against traffic or other use by placing warning signs, fences, and erecting any barricades that may be required before or immediately after sowing is completed.

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

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

C. Watering: Install and maintain water trucks, temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches (100 mm).

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water turf with fine spray at a minimum rate of 1 inch (25 mm) per week unless rainfall precipitation is adequate.
3. Onsite water may be used once the water lines are constructed and functional. Coordinate usage with Owner.

D. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:

1. Mow areas to a height of 2 to 3 inches.

E. Turf Postfertilization: Apply slow-release fertilizer after initial mowing and when grass is dry.

1. Apply fertilizer at a rate of at least 7 lb/1000 sq. ft. of turf area or as recommended by the manufacturer.

3.7 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Owner:

1. Satisfactory Seeded Turf: A healthy, uniform, recently mowed, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 3 by 3 inches.
2. Satisfactory Sodded Turf: A healthy, uniform, recently mowed, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
3. All turf areas shall be smooth, free of debris, rocks, sticks, voids, etc, and shall be easily and comfortably mowable. This includes areas around all items that are intended to be mowed over like utility pullboxes/hand holes, valve covers, grated inlets, manholes, etc.

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

C. Obtain approval of satisfactory turf for all areas by Owner.

3.8 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.9 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove waste material, trash, and debris, and legally dispose of them off Owner's property.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout maintenance period and remove as approved by Owner.

3.10 MAINTENANCE SERVICE

A. Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Begin maintenance immediately after each area is planted and continue until acceptable turf is established, but for not less than the following periods:

1. Seeded Turf: As long as required until satisfactory turf is established and approved by Owner.
2. Sodded Turf: As long as required until satisfactory turf is established and approved by Owner.

END OF SECTION 32 92 00

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SECTION 32 93 00
LANDSCAPE PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Plants.
2. Tree stabilization.
3. Tree-watering devices.

B. Related Requirements:

1. Section 329200 "Turf and Grasses" for turf (lawn) materials.

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with a ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than the minimum root spread according to ANSI Z60.1 for type and size of plant required.

D. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

E. Finish Grade: Elevation of finished surface of planting soil.

F. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.

G. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

H. Planting Area: Areas to be planted.

I. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

J. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

K. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

L. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

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

1.4 COORDINATION

A. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.

1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
2. Plant Photographs: Include color photographs in digital format of each required species and size of plant material as it will be furnished to Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 20 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.
3. Slow release watering devices.

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

1. Mulch: 1-pint (0.5-L) volume of each mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
2. Proprietary Root-Ball-Stabilization Device: One unit.
3. Slow-Release, Tree-Watering Device: One unit of each size required.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:

1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

D. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of plants.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience: Three years' experience in landscape installation.
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Pesticide Applicator: State licensed, commercial.

B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

C. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches (150 mm) above the root flare for trees up to 4-inch (100-mm) caliper size, and 12 inches (300 mm) above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

D. Plant Material Observation: Owner may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Owner may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or

defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify Owner of sources of planting materials seven days in advance of delivery to site.

1.9 DELIVERY, STORAGE, AND HANDLING

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

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

C. Deliver bare-root stock plants within 24 hours of digging. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting. Transport in covered, temperature-controlled vehicles, and keep plants cool and protected from sun and wind at all times.

D. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

E. Handle planting stock by root ball.

F. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F (16 to 18 deg C) until planting.

G. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.

1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

H. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

I. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1. Heel-in bare-root stock. Soak roots that are in less than moist condition in water for two hours. Reject plants with dry roots.

2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.
4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

1.10 FIELD CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting: March 1 to May 15.
2. Fall Planting: August 15 to November 15.

C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.11 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth, or health.
b. Structural failures including plantings falling or blowing over.
c. Faulty performance of tree stabilization.
d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Periods: From date of Substantial Completion and acceptance by Owner.

a. Trees, Shrubs, Vines, and plantings: 12 months.

3. Include the following remedial actions as a minimum:

a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
c. A limit of one replacement of each plant is required except for losses or replacements due to failure to comply with requirements.
d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch (19 mm) in diameter; or with stem girdling roots are unacceptable.
2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Owner, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label each plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant.

E. If formal arrangements or consecutive order of plants is indicated on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

F. Annuals: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery and that are in bud but not yet in bloom.

2.2 FERTILIZERS

A. Planting Tablets: Tightly compressed chip-type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.

1. Size: 5-gram tablets.
2. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

2.3 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Shredded hardwood.
2. Size Range: 3 inches (76 mm) maximum, 1/2 inch (13 mm) minimum.
3. Color: Natural.

2.4 PESTICIDES

A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

2.5 TREE-STABILIZATION MATERIALS

A. Trunk-Stabilization Materials:

1. Upright and Guy Stakes: Rough-sawn, sound, new softwood with specified wood pressure-preservative treatment, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal (38-by-38-mm actual) by length indicated, pointed at one end.
2. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes or turnbuckles and compression springs.
3. Guys and Tie Wires: ASTM A 641/A 641M, Class 1, galvanized-steel wire, two-strand, twisted, 0.106 inch (2.7 mm) in diameter.
4. Tree-Tie Webbing: UV-resistant polypropylene or nylon webbing with brass grommets.
5. Guy Cables: Five-strand, 3/16-inch- (4.8-mm-) diameter, galvanized-steel cable, with zinc-coated [turnbuckles] [compression springs], a minimum of 3 inches (75 mm) long, with two 3/8-inch (10-mm) galvanized eyebolts.
6. Flags: Standard surveyor's plastic flagging tape, white, 6 inches (150 mm) long.

2.6 TREE-WATERING DEVICES

A. Slow-Release Watering Device: Standard product manufactured for drip irrigation of plants and emptying its water contents over two to nine hours; manufactured from UV-light-stabilized nylon-reinforced polyethylene sheet, PVC, or HDPE plastic.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Tree Gator.
    b. BIO-PLEX.
    c. Engineered Watering Solutions; PQ Partners, LLC.
    d. Spectrum Products, Inc.

2. Color: green or tan.

2.7 MISCELLANEOUS PRODUCTS

A. Wood Pressure-Preservative Treatment: AWPA U1, Use Category UC4a; acceptable to authorities having jurisdiction, and containing no arsenic or chromium.

B. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

C. Burlap: Non-synthetic, biodegradable.

D. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb (0.45 kg) of vesicular-arbuscular mycorrhizal fungi and 95 million spores per lb (0.45 kg) of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants, with Installer present, for compliance with requirements and conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Verify that plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
3. Verify all areas are to correct finish grade elevations.
4. Level and smooth all eroded areas.
5. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
6. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Owner and replace with new planting soil.

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

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Owner's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Lay out plants at locations directed by Owner. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

3.3 PLANTING AREA ESTABLISHMENT

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

B. Application of Mycorrhizal Fungi: Not required, but can be applied if believed it will increase survivability. Broadcast dry product uniformly over prepared soil at application rate according to manufacturer's written recommendations.

3.4 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits.

1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
2. Excavate approximately two times as wide as ball diameter for balled and burlapped stock.
3. Excavate at least 12 inches (300 mm) wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
4. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
5. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
6. Maintain angles of repose of adjacent materials to ensure stability. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
7. Maintain supervision of excavations during working hours.
8. Keep excavations covered or otherwise protected when unattended by Installer's personnel.
9. If drain tile is indicated on Drawings or required under planting areas, excavate to top of porous backfill over tile.

B. Backfill Soil: Subsoil and topsoil removed from excavations may be used as backfill soil unless otherwise indicated.

C. Obstructions: Notify Owner if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

1. Hardpan Layer: Drill 6-inch- (150-mm-) diameter holes, 24 inches (600 mm) apart, into free-draining strata or to a depth of 10 feet (3 m), whichever is less, and backfill with free-draining material.

D. Drainage: Notify Owner if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE, SHRUB, AND VINE PLANTING

A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Balled and Burlapped Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch (25 mm) above adjacent finish grades.

1. Backfill: excavated soil.
2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole.

    a. Quantity: As recommended by manufacturer.

5. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Balled and Potted and Container-Grown Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch (25 mm) above adjacent finish grades.

1. Backfill: excavated soil.
2. Carefully remove root ball from container without damaging root ball or plant.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole.

    a. Quantity: As recommended by manufacturer.

5. Continue backfilling process. Water again after placing and tamping final layer of soil.

E. Bare-Root Stock: Set and support each plant in center of planting pit or trench with root flare 1 inch (25 mm) above adjacent finish grade.

1. Backfill: excavated soil.
2. Spread roots without tangling or turning toward surface. Plumb before backfilling, and maintain plumb while working.
3. Carefully work backfill in layers around roots by hand. Bring roots into close contact with the soil.

4. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
5. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside soil-covered roots about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole or touching the roots.

    a. Quantity: As recommended by manufacturer.

6. Continue backfilling process. Water again after placing and tamping final layer of soil.

F. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.6 TREE, SHRUB, AND VINE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees, shrubs, and vines as directed by Owner.

C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Owner, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

D. Do not apply pruning paint to wounds.

3.7 TREE STABILIZATION

A. Trunk Stabilization by Upright Staking and Tying: Install trunk stabilization as follows unless otherwise indicated:

1. Upright Staking and Tying: Stake trees of 2- through 5-inch (50- through 125-mm) caliper. Stake trees of less than 2-inch (50-mm) caliper only as required to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches (450 mm) below bottom of backfilled excavation and to extend at least 60 inches above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
2. Space stakes equally around trees.
3. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

3.8 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated on Drawings in even rows with triangular spacing.

B. Use planting soil for backfill.

C. Dig holes large enough to allow spreading of roots.

D. For rooted cutting plants supplied in flats, plant each in a manner that minimally disturbs the root system but to a depth not less than two nodes.

E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.9 PLANTING AREA MULCHING

A. Mulch backfilled surfaces of planting areas and other areas indicated.

1. Trees and Shrubs in Turf Areas: Apply mulch ring of 3-inch (75-mm) average thickness, with 48-inch radius around trunks or stems. Do not place mulch within 2 inches of trunks or stems.

2. Mulch in Planting Areas: Apply 3-inch (75-mm) average thickness of mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 1 inch of trunks or stems.

3. For all Conifers or Evergreen Trees Installed within 20 Feet of Each Other: Apply a continuous mulch strip of 3-inch average thickness, 48-inch minimum width between and around the line of trees.

3.10 INSTALLING SLOW-RELEASE WATERING DEVICE

A. Provide one device for each tree and shrub similar to Treegator or approved equal.

B. Place device on top of the mulch at base of tree or shrub stem and fill with water according to manufacturer's written instructions.

3.11 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

D. All trees and shrubs shall be watered once a week with a minimum of 15 gallons by a slow release watering device. If 1 inch or more of rain falls on the site within 7 days of the previous watering,

watering can be suspended for 7 days after the rainfall event if approved by Owner. All other plants shall be watered at a minimum rate of 1 inch per week.

3.12 PESTICIDE APPLICATION

A. As needed, apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.13 REPAIR AND REPLACEMENT

A. General: Repair or replace existing or new trees and other plants that are damaged, in a manner approved by Owner.

1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Owner.

B. Remove and replace trees, shrubs, and landscape plants that are more than 25 percent dead or in an unhealthy condition or are damaged during construction operations that Owner determines are incapable of restoring to normal growth pattern.

1. Provide new plants of same size as those being replaced.

3.14 CLEANING AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

C. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

D. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

E. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.15 MAINTENANCE SERVICE

A. Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance Period: Throughout construction and until Substantial Completion of the project and acceptance of all landscaping by the Owner.
2. Approximately one month prior to the end of the maintenance service period, coordinate and arrange a site walk thru with Owner to determine the condition of all landscaping. Immediately make all corrections as determined from this walk thru and arrange another walk thru with Owner. Continue this process until all landscaping is deemed acceptable by Owner.

B. At Substantial Completion and acceptance by the Owner of all landscaping, the Warranty Period shall begin.

END OF SECTION 32 93 00

SECTION 33 41 00
STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Pipe and fittings.
2. Cleanouts.
3. Stormwater inlets.

1.3 DEFINITIONS

A. None.

1.4 SUBMITTALS

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

B. Shop Drawings:

1. Junction Boxes: Include plans, elevations, sections, details, frames, and covers.
2. Catch basins, stormwater inlets, and junction boxes. Include elevations, sections, details, frames, covers, and grates.
3. Stormwater Detention Structures: Include elevations, sections, details, frames, covers, and concrete design-mix reports.
4. Pipe Outlets: Include elevations, sections, and details.

C. Field quality-control reports.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic structures, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle structures according to manufacturer's written rigging instructions.

D. Handle catch basins and stormwater inlets according to manufacturer's written rigging instructions.

PART 2 - PRODUCTS

2.1 PE PIPE AND FITTINGS

A. High Density Corrugated PE Pipe with integrally formed smooth waterway AASHTO M 252 and M294, Type S.

1. Manufacturer: Advanced Drainage Systems (ADS) N-12ST HDPE pipe, or approved equal.
2. Soil tight gasketed joints.

2.2 PVC PIPE AND FITTINGS

A. PVC Sewer Piping:

1. Pipe: ASTM D 3034, SDR 35, PVC sewer pipe with bell-and-spigot ends for gasketed joints.
2. Fittings: ASTM D 3034, PVC with bell ends.
3. Gaskets: ASTM F 477, elastomeric seals.

2.3 CLEANOUTS

A. Plastic Cleanouts:

1. Description: HDPE or PVC body with either PVC top or cast-iron frame and lid depending on location. See civil plan for details.

2.4 STORMWATER INLETS

A. PVC Inlets: As manufactured by Nyloplast and as shown in the civil plans or approved equal. Include heavy duty iron frames and grates.

2.5 EARTHWORK

A. Excavation, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

2.6 PIPING INSTALLATION

A. Locations and Arrangements: Drawing plans and details indicate location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated.

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

C. Install gravity-flow, nonpressure drainage piping according to the following:

1. Install piping pitched down in direction of flow.

2. Install piping with to depths indicated in civil plans. Minimum cover for HDPE pipe shall be maintained per manufacturer's Specifications.
3. Install PVC profile gravity sewer piping as detailed in civil plans.
4. Install reinforced-concrete sewer piping as detailed in civil plans.

2.7 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure drainage piping according to the following:

1. Join PVC profile gravity sewer piping according to ASTM D 2321 for elastomeric-seal joints or ASTM F 794 for gasketed joints.
2. Join reinforced-concrete sewer piping according to ACPA's "Concrete Pipe Installation Manual" for rubber-gasketed joints.

2.8 CLEANOUT INSTALLATION

A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade as detailed in civil plans.

2.9 STORMWATER INLET INSTALLATION

A. Construct inlets to sizes and shapes indicated.

B. Set frames and grates to elevations indicated.

2.10 STORMWATER OUTLET INSTALLATION

A. Construct flared end sections of galvanized metal, as indicated.

B. Construct riprap of broken stone, as indicated.

C. Install outlets that spill onto grade, with flared end sections that match pipe, where indicated.

2.11 CONNECTIONS

A. Connect nonpressure, gravity-flow drainage piping in building's storm building drains specified in Division 22 Section "Facility Storm Drainage Piping."

2.12 IDENTIFICATION

A. Materials and their installation are specified in Division 31 Section "Earth Moving." Arrange for installation of green warning tape directly over piping.

1. Use detectable warning tape over nonferrous piping.

2.13 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches (610 mm) of backfill is in place, and again at completion of Project.

1. Submit separate reports for each system inspection.
2. Defects requiring correction include the following:

    a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
    d. Infiltration: Water leakage into piping.
    e. Exfiltration: Water leakage from or around piping.

3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to requirements of authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate report for each test.

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

2.14 CLEANING

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

END OF SECTION 33 41 00