

# PROJECT MANUAL



**#2022-20**  
**PROJECT MANUAL -**  
**ROCK COUNTY JAIL/LES**  
**BP#1 FOOTING & FOUNDATION**  
**200 US-14, Janesville, Wisconsin 53545**  
**FOR**  
**ROCK COUNTY FACILITIES MANAGEMENT**

***/Venture/Architects***

**Venture Project No. #210011.00**

**THIS PAGE INTENTIONALLY BLANK**



**#2022-20  
INVITATION TO BID  
LES / JAIL – FOOTINGS AND FOUNDATION  
FOR  
FACILITIES MANAGEMENT  
ROCK COUNTY, WISCONSIN**

Bids due in Rock County Purchasing Division by:

**MAY 25, 2022 – 2:00 p.m.**

Bids received after this date and time will be rejected. Bids must remain in effect for the life of the contract period. Address

Bid to: Shilo Titus, Purchasing Manager  
Rock County Purchasing Division  
Rock County Courthouse  
51 S. Main Street  
Janesville WI. 53545

**\*MARK SEALED ENVELOPE: #2022-20 – LES / JAIL FOOTINGS AND FOUNDATIONS\***

Rock County reserves the right to accept or reject any or all bids; to waive any technicality or error in any bid or part therein, and to accept the same or combinations, in whole or in part, whichever is deemed to be in the best interest of Rock County.

Contracts are awarded to the lowest, most qualified, responsible, and responsive bidder based on the base bid and full consideration of any or all alternatives, as may be in the best interest of Rock County. In determining the award of contract, Rock County will consider the scope of the work involved, time of delivery, competency of bidder, bidder's ability to render satisfactory service, and past performance. If two or more bidders submit identical bids, Rock County will make award to bidder of its choice and such decision will be final.

**INSTRUCTIONS FOR BID**

Bidders are required to submit their bid either via Demandstar, or in a sealed envelope marked ITB #2022-20 to Shilo Titus, Purchasing Division, 51 South Main, Janesville, WI 53545. All bids must be received by **2:00 p.m. (local time). May 25, 2022.** Any bid submitted after this date and time will be rejected. Vendors are responsible for ensuring that the above office receives their bid before the deadline. No faxed bids will be accepted.

Bids shall be signed with name printed below signature. Where Bidder is a Corporation, Bid must be signed with the legal name of the Corporation followed by the legal signature of an officer authorized to bind the Corporation to contract.

Bidders must be licensed to do business in the State of Wisconsin when required by law.

Each Bid shall be based on the provisions in the Instructions to Bidders, General Conditions of the Contract for Construction AIA Document A201-2007 Edition Modified, Supplementary General Conditions, Special Conditions, Divisions 0 and 1 and Specification Sections, related Drawings and Work Package sections

Specification sections are used to designate areas of work. All bidders should review all specifications and plan documents to evaluate the extent of their work category.

Bid Package #1 includes solicitations for the following work packages"

- Work Package #1.02.A – Excavation and Site Utilities
- Work Package #1.03.A – Concrete Foundations
- Work Package #1.05.A – Steel Joist and Deck Material

## INQUIRIES

All questions concerning this Invitation to Bid shall be submitted in writing to Shilo Titus, Purchasing Manager. Questions shall be received by 12:00 noon (local time), May 13, 2022. Questions received after this date and time will not be answered. Questions shall be e-mailed to [shilo.titus@co.rock.wi.us](mailto:shilo.titus@co.rock.wi.us).

No verbal explanation or instructions will be given regarding the meaning of the drawings or specifications during the bid period. Bidders shall bring inadequacies, omissions, or conflicts to Rock County's attention in writing by the question cut-off date and time. If necessary, answers to questions will be provided to all specification holders in the form of an addendum. Addendum will include a list of each question received and Rock County's response.

## PRE-BID CONFERENCE & SITE TOUR

A Pre-Bid Conference will be held on May 5, 2022 at 9:00 a.m. Interest vendors should meet outside at the Rock County Sheriff's Department Front Entry, Janesville, Wisconsin. The purpose of this conference is to provide any needed additional information to vendors for the submission of their bid and to tour the site.

## ADDENDA

All changes in or interpretations of the Bidding Documents prior to bid opening will be made by written addenda issued by Rock County and posted in Demandstar and on the Rock County's website ([www.co.rock.wi.us](http://www.co.rock.wi.us)) All addenda's will be issued no later than 72 hours prior to bid opening.

## PROJECTED TIMETABLE

Issue Invitation to Bid	4/27/2022
Pre-Bid Meeting	5/5/2022 – 9:00 am
Questions Due	5/13/2022 – 12:00 pm (noon)
Amendments Issued by	5/18/2022 – 3:00 pm
Bids Due	5/25/2022 – 2:00 pm
Evaluation of Bids	5/25/2022 – 5/31/2022
Committee Approval	6/1/2022
County Board Approval-if needed	6/9/2022
Contract Execution	6/10/2022
Construction Start	6/20/2022

Vendors not involved in the final selection process will be notified in writing. The above schedule is for informational purposes only and is in no way binding upon Rock County.

## PERFORMANCE BOND AND LABOR AND MATERIALS PAYMENT BOND

The Bidder shall identify the added cost to the base bid to furnish a Performance Bond and Labor and Materials Payment Bond each in the amount of 100% of the Contract Sum. All such bonds shall be issued by a surety company licensed to do business in the State of Wisconsin. Bidder shall pay all premiums. The Construction Manager or Rock County may require a bond and cost will be added to Base Bid. If so, deliver said bonds to the Construction Manager or Rock County no later than the date of execution of the contract. Failure or neglecting to deliver said bonds as specified, may be considered as having abandoned the Contract, and the Bid Security will be retained as liquidated damages.

## BID BOND

Bidder shall provide a bid bond or guarantee with bid in amount of 5% as shown on bid form.

## VENDOR SUPPLIED DOCUMENTATION AND MATERIALS

All vendor-supplied materials, including the vendor's bid, become the property of Rock County. We will work with vendors to meet their confidentiality requirements if they are within reason. All vendor confidential material must have each page clearly marked as confidential. Wisconsin "Open Records Laws" apply. Rock County's determination to treat matters as public or confidential under the Wisconsin Open Records Law shall be final.

## BID AND PRESENTATION COSTS

Rock County will not be liable in any way for any costs incurred by the offerors in the presentation of their Bid in response to this Invitation to Bid nor for the presentation of their Bid and/or participation in any discussions or negotiations.



## COMPLIANCE WITH INVITATION TO BID

Bids submitted shall be in strict compliance with the Invitation to Bid. Failure to comply with all provisions on the ITB may result in disqualification. Failure to visit the site or failure to examine all Contract Documents will in no way relieve the successful Bidder from necessity of furnishing any materials or equipment, or performing any work, that may be required to complete the work in accordance with the drawings and specifications. Neglect of the above requirements will not be accepted as reason for the delay in the work or additional compensation.

## IMPLIED REQUIREMENTS

Products and services that are not specifically addressed in this Invitation to Bid, but which are necessary to provide functional capabilities proposed by the offeror, must be included in the bid.

## NON-DISCRIMINATION

In connection with the performance of work under this contract, the contractor agrees not to discriminate against any employee or applicant for employment because of age, race, religion, color, handicap, sex, physical condition, developmental disability as defined in s.51.01 (5)(a), sexual orientation, national origin, or military service as defined in §111.355(1), Wis. Stats. This provision shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor further agrees to take affirmative action to ensure equal employment opportunities. The contractor agrees to post in conspicuous places, available for employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of the non-discrimination clause (Wisconsin Statutes S.16.765 (2)).

## INDEMNIFICATION

The contractor to perform services for Rock County shall indemnify, hold harmless, and defend Rock County, its officers, agents, and employees from any and all liability including claims, demands, losses, costs, damages and expenses of any kind and description or damage to person or property arising out of or in connection with or occurring during the course of any agreement between the contractor and Rock County where such liability is founded upon or grows out of the acts, omissions, negligence or misconduct of any agents or employees of the contractor.

## INSURANCE REQUIREMENTS

The Contractor further agrees that to protect itself and County it will always during the term of this agreement keep in force and effect worker's compensation, comprehensive general, and auto liability insurance policies by a company or companies authorized to do business in Wisconsin with limits of:

Personal and bodily injury	Per person	\$1,000,000
	Per accident	\$2,000,000
Property damage:	Each Occurrence	\$500,000
	Aggregate	\$500,000

Coverage shall apply as primary with County named as an additional named insured. Contractor shall also provide a copy of the additional insured endorsement. Contractor shall furnish satisfactory proof of insurance to County prior to the date of Contract Execution or commencing work for the County. Requirements are outlined in Specification Section 00 65 00.

## MODIFICATION AND WITHDRAWAL

Bids may not be modified after submittal. Bidders may withdraw Bids at any time before the Bid opening but may not resubmit them. No Bid may be withdrawn or modified after the Bid opening except where the award of Contracts has been delayed for more than 60 days from the day of the Bid opening.

## PROOF OF COMPETENCY OF BIDDER

Any Bidder may be required to furnish evidence satisfactory to Rock County that the Bidder and proposed subcontractors have sufficient means, expertise, financial ability, and experience in the types of work bid to assure completion of the Contract in a satisfactory manner.

## **CONFLICT OF INTEREST**

All respondents must disclose with their Bid, the name of any officer, director or agent who is also an officer or employee of Rock County. Further, all respondents must disclose the name of any Rock County officer or employee who owns, directly or indirectly, any interest in the vendor's firm or any of its branches. Failure to disclose this information will result in disqualification of Bid and/or cancellation of Contract. Rock County reserves the right to seek damages for recoupment of losses in having to re-let or reassign.

## **QUANTITIES**

Quantities shown within the Invitation to Bid are based upon estimated needs. The County reserves the right to increase or decrease quantities to meet actual needs or availability of funds.

## **QUALITY LEVEL**

Unless otherwise indicated in the Invitation to Bid, all materials shall be first quality. Items which are used, obsolete, or which have been discontinued are unacceptable without prior written approval by Rock County.

## **DEVIATION AND EXCEPTIONS**

Deviations and exceptions from terms, conditions, or specifications will be described fully under the bidder's letterhead, signed, and attached to the Bid. In the absence of such statements, the bid will be accepted as in strict compliance with all terms, conditions, and specifications and the bidder shall be held liable.

## **SUBSTITUTIONS**

When substitutions are bid, they must be identified by manufacturer, stock number, and other descriptive information to establish equivalencies. **Substitutions must be requested prior to the question cut-off date and time.** Rock County shall be the sole judge of equivalency.

## **DISQUALIFICATION**

Rock County reserves the right to disqualify Bids, before and after opening upon evidence of collusion with the intent to defraud or other illegal practices upon the part of the Bidder.

## **DEBARMENT**

The Contractor certifies through signing their Bid that neither the Contractor nor any of its principals are debarred, suspended, proposed for debarment, or declared ineligible by any federal department or agency. In addition, the Contractor shall notify Rock County within five business days in writing by registered mail if the Contractor or its principals receive a designation from the federal government that they are debarred, suspended, proposed for debarment, or declared ineligible by a federal agency.

## **REQUEST FOR CLARIFICATION**

All requests by Rock County for clarification of bids will be in writing. Such requests shall not alter the offeror's pricing information contained in its bid.

## **SAFETY REQUIREMENTS**

Materials, equipment, and supplies provided to the County shall comply fully with all safety requirements that are set forth by the Wisconsin Administrative Code, Rules of the Industrial Commission on Safety, and all applicable OSHA standards. When furnishing toxic or hazardous materials as defined in sub-part "Z" of the U. S. Occupational Safety and Health Standards, the contractor shall furnish OSHA Form 20, "Material Safety and Data Sheet", for each item provided. Further, during performing the service necessary to satisfy the requirements of any Invitation to Bid, the contractor is fully liable for public and private protection while work is in progress or at any site exposed as a potential hazard. Contractor shall provide warning devices and/or signs, which shall be prominently installed and displayed, and be fully in compliance with safety regulations.

## **SUBSTANCE ABUSE POLICY**

Pursuant to Wis. Stat. 103.503(3), contractor, subcontractor or agent of a contractor or subcontractor that will be performing any work on this public works project verifies that it has in place, prior to the commencement of any work on this project, a written program for the prevention of substance abuse among its employees. Said verification includes confirmation that the written program contains all the following:

1. A prohibition against any employee using, possessing, attempting to possess, distributing, delivering, or being under the influence of a drug, or use or be under the influence of alcohol, while performing work on this project.
2. A requirement that employees performing work on this project shall submit to random, reasonable suspicion, and post-accident drug and alcohol testing and to drug and alcohol testing before commencing work on this project, except that testing of an employee before commencing work on this project is not required if the employee has been participating in a random testing program during the ninety (90) days preceding the date on which the employee commences work on this project.
3. A procedure for notifying an employee who tests positive or who refuses to submit to drug or alcohol testing that he/she may not perform work on this project or have access to this project until he/she has submitted to the required drug or alcohol testing and does not test positive.

Rock County is not responsible for the cost of developing, implementing, or enforcing this required substance abuse prevention program in any way; nor is it responsible for the cost of drug and alcohol testing any employee. Each employer shall be responsible for said costs.

## **AWARD**

Award will not be made to any Bidder in default of a Contract with Rock County, or to any Bidder having as its agent or employee, any individual previously in default or guilty of misrepresentation.

## **TAXES**

Rock County is exempt from the payment of all federal excise taxes, registration no. 41407 (For tax-free transactions under Chapter 32 of the Internal Revenue Code. The certificate of exemption is on file with the District Attorney, U. S. Treasury Department, Internal Revenue Service, Milwaukee, Wisconsin). Rock County is exempt from Wisconsin State and Local taxes on its purchases except Wisconsin excise tax as the Wisconsin Department of Revenue does not issue state exempt numbers to Counties per Wisconsin Statute 77.54 (9) (a). Contractors performing construction activities are required to pay state user tax on the cost of materials which they purchase. Rock County is required to pay an excise tax on Wisconsin beer, liquor, wine, cigarettes, tobacco products, motor vehicle fuel engine oil and aviation fuel.

## **CONTRACT**

The documents that will form the contract include the "Invitation to Bid", any attachments or addendum and the successful respondent's "Bid". Rock County may, at their discretion, assign subcontracts to the Construction Manager.

## **APPLICABLE LAW**

All contracts are governed under the laws of the State of Wisconsin and are made at Rock County, Wisconsin, and venue for any legal action to enforce the terms of the agreement will be in Rock County Circuit Court.

## **COMPLIANCE WITH LAWS**

The Contractor shall give all notices required by and shall otherwise comply with all applicable laws, ordinances and codes and shall, at his own expense, secure and pay the fees and charges for all permits required for the performance of the contract. All materials furnished and work done is to comply with all local, state, and federal laws and regulations.

## **TERMINATION FOR DEFAULT**

The contract may be terminated by Rock County, in whole or in part, in writing, whenever the County determines that the Contractor has failed to meet performance requirements of the Contract.

## **TERMINATION FOR CONVENIENCE**

Rock County reserves the right to terminate the Contract, in whole or in part, by giving the Contractor written notice of at least thirty (30) days prior to the effective date of the termination. Upon receipt of termination from Rock County, the Contractor shall only provide those services specifically approved or directed by Rock County. All other rights and duties of the parties under the Contract shall continue during such notice period.

## **CANCELLATION**

Failure to maintain the required certificates of insurance, permits, licenses and bonds will be cause for contract termination. If the Contractor fails to maintain and keep in force the required insurance, Rock County shall have the right to cancel and terminate the contract without notice.

Rock County reserves the right to cancel a purchasing contract in whole or in part without penalty due to the non-appropriation of funds or for failure of the contractor to comply with terms, conditions, and specifications of the contract. Any dispute arising as to quality and quantity is subject to arbitration as provided in Chapter 788, Wisconsin Statutes.

## **FORCE MAJEURE**

Neither party to this agreement shall be liable to the other for any cost or damages if the failure to perform the Contract arises out of causes beyond the control and without the fault or negligence of the parties. Such causes may include, but are not restricted to, acts of God, fires, quarantine restriction, strikes and freight embargoes. In all cases, the failure to perform must be totally beyond the control and without fault or negligence of the party.

## **PERMITS, LICENSES AND FEES**

The selected vendor shall be responsible for obtaining all permits, licenses, certifications etc. required by Federal, State, County and Municipal laws, regulations, codes, and ordinance for the performance of the work required in these specifications and to conform with the requirements of said legislation.

## **PATENT FEES, ROYALTIES AND LICENSES**

By accepting a contract or purchase order from Rock County, the vendor or contractor guarantees that the sale or use of the items or goods being provided will not infringe any United States patent, and covenants that it will at its own expense defend every suit which may be brought against Rock County, (provided that such party is promptly notified of such suit, and all papers therein are delivered to it) for any alleged infringement of any patent by reason of the sale or use of such article or articles, and agrees that it will pay all costs, damages and profits recoverable in such suit. The party selling to Rock County guarantees that the items or goods being provided were manufactured in accordance with applicable federal labor laws.

## **PUBLIC ENTITIES CRIMES**

A person or affiliate that has been convicted of a public entity crime is not allowed to submit a Bid for this contract.

## **PUBLIC RELATIONS IMAGE**

Selected vendor's personnel shall always handle complaints and any public contact with due regard to the County's relationship with the public. Any personnel in the employ of the selected vendor involved in the execution of work that is deemed to be conducting themselves in an unacceptable manner shall be removed from the contract at the request of Rock County.

## **PUBLICITY RELEASES**

Contractor agrees not to refer to award of this contract in commercial advertising in such a manner as to state or imply that the products or services provided are endorsed or preferred by Rock County. The contractor shall not have the right to include the County's name in its published list of customers without prior approval of Rock County. The contractor further agrees not to publish or cite in any form, any comments, or quotes from County staff.

## **ASSIGNMENT & SUBCONTRACTING**

The selected Contractor will not be permitted to sublet, sell, transfer, assign or otherwise dispose of the contract or any portion therein, or its right, title or interest in, to any person, firm or corporation without the written consent of Rock County.

## **VENDOR'S RELATIONSHIP TO ROCK COUNTY**

It is expressly agreed and understood that the successful vendor is in all respects an Independent Contractor as to the work, and the vendor is in no respect an agent, servant, or employee of Rock County. The contract will specify the work to be done by the vendor, but the method utilized to accomplish the work shall be the responsibility of the vendor.

## **DEFICIENCIES**

If Rock County determines that there are deficiencies in the service work provided by the vendor under the contract, Rock County shall notify the vendor in writing as to the precise nature of any such deficiencies. Within ten (10) working days of receipt of such notice, vendor shall take responsible steps to correct any deficiencies.

## **GUARANTEED DELIVERY**

Failure of the contractor to adhere to the delivery schedule that is specified or to promptly replace rejected materials renders the contractor liable for all costs more than contract price if alternate procurement is necessary. Excess costs include administrative costs.

## **WORK CHANGES**

Rock County reserves the right to order work changes in additions, deletions, or modifications without invalidating the Contract.

## **WORK SITE DAMAGE**

Any damage, including damage to finished surfaces, resulting from the performance of this contract shall be repaired to Rock County's satisfaction at the Contractor's expense.

## **RECORDS**

The Contractor shall maintain accurate and complete records. All books and records pertaining to the performance of the contract shall be made available at any time during the contract and for three years following the expiration of said contract to the Rock County Finance Department, Purchasing Department or any independent auditing firm acting at the direction of Rock County.

## **BACKGROUND CHECKS AND SECURITY CLEARANCE**

All CONTRACTOR'S tradespeople performing Work within the existing jail with residents (inmates) present must go through Rock County's required background check & security clearance. Rock County reserves the right to deny access into existing facilities for any reason. CONTRACTOR'S tradespeople must be escorted by an employee of the sheriff's department & remain within line of sight of said employee at all times while inside active facilities.

**THIS PAGE INTENTIONALLY BLANK**

## TABLE OF CONTENTS

LES/JAIL BP#1  
200 US-14, Janesville, Wisconsin 53545

### SECTION

---

#### DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

00 00 01	Cover Page
00 00 10	Invitation to Bid
00 01 00	Table of Contents
00 21 13	Work Packages
00 31 32	Geotechnical Data
00 41 00	Bid Form
00 41 10	Bidder's Qualification Statement Affidavit of Compliance
00 50 00	Agreement Forms (CM)
00 61 00	Bonds (CM)
00 65 00	Certificate of Insurance (CM)
00 70 00	General Conditions (CM)
00 73 05	Special Conditions
00 83 00	Equal Employment Opportunity (CM)

#### DIVISION 01 - GENERAL REQUIREMENTS

01 01 50	Use of Premises (CM)
01 04 00	Coordination (CM)
01 04 50	Cutting and Patching (CM)
01 05 00	Field Engineering (CM)
01 11 00	Summary of Work
01 15 20	Application for Payment (CM)
01 17 00	Safety Requirements (CM)
01 17 10	Fire Precaution (CM)
01 20 00	Meetings (CM)
01 21 00	Allowances
01 25 00	Substitution Procedures
01 25 19	Substitution Request Form
01 26 00	Contract Modification Procedures
01 26 13	Requests for Information (RFI's)
01 31 00	Construction Schedule (CM)
01 33 00	Submittal Procedures
01 40 00	Quality Requirements
01 45 23	Testing and Inspection Procedures
01 50 00	Temporary Facilities
01 50 05	Temporary Utilities (CM)
01 50 08	Special Conditions (CM)
01 51 00	Indoor Air Quality (CM)
01 52 50	Construction Aids (CM)
01 53 05	Barricades and Enclosures (CM)
01 54 00	Security (CM)
01 56 39	Protection of Existing Trees
01 59 00	Field Offices (CM)
01 60 00	Product Requirements
01 60 05	Material and Equipment (CM)
01 71 00	Cleaning (CM)
01 73 00	Execution
01 74 19	Construction Waste Management and Disposal
01 75 00	No Smoking and Appearance of Clothing (CM)
01 77 00	Closeout Procedures
01 78 23	Operation and Maintenance Data
01 78 39	Project Record Documents

#### DIVISION 02 - EXISTING CONDITIONS

02 41 13	Demolition
----------	------------

## TABLE OF CONTENTS

LES/JAIL BP#1  
200 US-14, Janesville, Wisconsin 53545

### SECTION

---

#### DIVISION 03 – CONCRETE

03 10 00	Concrete Formwork
03 20 00	Reinforcing Steel
03 30 00	Cast-In-Place Concrete
03 35 00	Concrete Hardener-Sealer
03 41 00	Precast Prestressed Concrete

#### DIVISION 05 – METALS

05 05 19	Post-Installed Anchors in Concrete and Masonry (CMU)
05 10 00	Structural Steel
05 20 00	Steel Joists
05 30 00	(PAF) Metal Deck

#### DIVISION 31 – EARTHWORK

31 00 00	Earthwork for Building
31 00 05	Civil General Requirements
31 05 00	Common Work Results for Earthwork (Outside Building Footprint)
31 23 16.13	Trenching
31 23 19	Dewatering
31 25 00	Erosion Control
31 40 00	Underpinning
31 62 16.10	Helical Steel Piers

#### DIVISION 33 - UTILITIES

33 05 00	Common Work Results for Utilities
33 11 00	Water Utility Distribution Piping
33 30 00	Sanitary Sewerage Utilities
33 40 00	Storm Drainage Utilities

END OF TABLE OF CONTENTS



SECTION 00 21 30  
WORK PACKAGES

Work Package #01.02.A – Excavation and Site Utilities  
Work Package #01.03.A – Concrete Foundations  
Work Package #01.05.A – Steel Joist and Deck Material

# Work Package# 1.02.A Excavation & Site Utilities

## Bid Package #1

This Work Package Contractor (Subcontractor) shall perform the listed work below in accordance with the Contract, Drawings, Specifications, and further clarifications and instructions below. The work shall include all labor, material, equipment, and required taxes as needed to complete the work. All Bidders shall include all fees and permit costs associated with this Work Package. The general building permit will be by the Construction Manager. The following information is intended to clarify the scope of work, not limit any portion of the Work Package.

J.P. Cullen & Sons, Inc. is acting as the Construction Manager. All references to the Construction Manager implies J.P. Cullen & Sons, Inc.

### Specifications to Include:

Division 00 Procurement & Contracting Requirements  
Division 01 General Requirements  
Section 01 56 39 Protection of Existing Trees  
Section 02 41 13 Demolition (as applicable)  
Section 31 00 00 Earthwork for Building  
Section 31 00 05 Civil General Requirements  
Section 31 05 00 Common Work Results for Earthwork (Outside Building Footprint)  
Section 31 23 16.13 Trenching  
Section 31 23 19 Dewatering  
Section 31 25 00 Erosion Control  
Section 31 40 00 Underpinning (earthwork only)  
Section 31 62 16.10 Helical Steel Piers  
Section 33 05 00 Common Work Results for Utilities  
Section 33 11 00 Water Utility Distribution Piping  
Section 33 30 00 Sanitary Sewerage Utilities  
Section 33 40 00 Storm Drainage Utilities

### I. GENERAL REQUIREMENTS

- a. Bidders shall include all labor, materials, equipment, and required taxes to furnish and install this work package.
- b. Reference Instruction to Bidders Section for all bidding requirements.
- c. All bids are to bid per plans and specifications prepared by Venture Architects. The scopes of work are for clarification only.
- d. All bidders shall include all fees and permit costs associated with this work package and provide copies of all permits for record. The general building permit will be by the Construction Manager.
- e. Subcontractors assigned to the Construction Manager will be required to required to sign the Construction Manager's subcontract, included in the specifications, without any modifications.
- f. Comply with the Construction Manager's safety policies including 6' fall protection. The Construction Manager's safety policy is available upon request.
- g. Subcontractors are to provide their own sets of plans for field use. The Construction Manager will provide plans electronically only (pdf format).
- h. All subcontractors are to assume and include any costs to complete the work in the scheduled durations and no additional costs will be awarded for overtime or shift work required to meet the stated schedule. All Subcontractors are to adhere to the project schedule.

- i. Subcontractors are to expect that their work will be performed in multiple mobilizations. No additional costs for mobilization will be accepted by the Construction Manager.
- j. All bidders shall participate in the Construction Manager's meetings including:
  - i. Pre-Construction Meetings at project start up
  - ii. Pre-installation Meetings before each construction activity that requires coordination with other contractors.
  - iii. Daily End of Shift Meeting at the end of each workday. Attendance and participation in these meetings are mandatory for all subcontractors working onsite.
  - iv. Weekly Progress Meetings
  - v. Safety Meetings
- k. The Subcontractor is responsible for field measurements, coordination, receiving, unloading, inspecting, and storage of their materials. Materials shall be brought on site with the coordination of the Construction Manager. Materials brought onsite early may require relocation to maintain the efficiency of other trades.
- l. Subcontractors are responsible to protect existing buildings from any damage for their work.
- m. Any debris left on site will be cleaned by the Construction Manager and back-charged to the appropriate party.
- n. All Subcontractors shall include layout for their own work.
- o. Subcontractors are to provide their own equipment as required to perform their work unless noted otherwise.
- p. If there is a valid reason that the Subcontractor must use equipment other than electrically powered, subcontractors are responsible for the ventilation of that equipment which is subject to approval by the Construction Manager.
- q. Subcontractors are required to provide their own flagmen for deliveries to the site as required.
- r. Subcontractors must provide their own extension cords. If temporary power greater than 120 v and 10 amps is required, subcontractors must provide hookups or generators.
- s. Each Subcontractor is to provide their own heat and weather protection for their own scope of work.
- t. Subcontractors are to provide daily reports to the Construction Manager. These reports are to include all work and subcontractors involved in working under their Subcontract. Daily reports are to include description of work being performed, progress, crew size, and safety concerns.
- u. Subcontractors are to provide weekly updated work schedules to the Construction Manager for all work to be performed in the following two weeks under their scope of work.
- v. Subcontractors will present to the Construction Manager a detailed operation plan prior to commencing any work as identified by the Construction Manager. The plan will include a detailed schedule of the work, manpower, loading, equipment required, site layout plans, and safety plan.
- w. Subcontractors are to provide on a weekly basis the copies of their weekly safety toolbox talk and sign in sheet(s).
- x. Subcontractors are to provide a full time and competent superintendent. The Superintendent must be a person with decision-making authority for the subcontractor.
- y. Subcontractors should include protection of their work from damages.
- z. Subcontractors will review the full bid documents to insure they have all the demolition and removals required for their work.
- aa. Subcontractors will review existing conditions and account for them in their bid.
- bb. All Subcontractors are to take the necessary precautions, perform testing, and have a program in place for Hazardous Material safety unless it can be verified that existing items to be removed or demolished contain no Hazardous Materials.

## II. WORK PACKAGE SPECIFIC

- a. Subcontractor shall provide:
  - i. All layout & surveying for utility work, earthwork & foundation excavations included.
  - ii. All dewatering as required for this scope until backfill is complete.
  - iii. All base courses under site paving, sidewalk, and curb & gutter.
  - iv. All drainage base courses under slabs-on-grade.
  - v. Remove and spread topsoil per plans and specifications.
  - vi. Cut all topsoil from the building footprint.
  - vii. Provide and maintain all erosion control measures per plans and specifications.
    - 1. Weekly DNR erosion control reports when onsite and all erosion repairs for the duration of the project.
  - viii. Restoration of Earthwork Contractor disturbed areas to existing planting conditions.
  - ix. Provide and remove temporary access roads. Location to be determined by construction manager.
  - x. Removal of all site items and trees/shrubs as indicated on plans.
  - xi. Tree removal and grubbing.
  - xii. Gravel base under site concrete, but not necessarily limited to:
    - 1. Sidewalks
    - 2. Curb and gutter
    - 3. Paving
  - xiii. Subcontractor responsible to hire & coordinate all required soil testing per specifications
  - xiv. All over excavation including disposal offsite of unsuitable excavated materials per specifications
  - xv. Excavation for underpinning as required.
  - xvi. Final grade and final elevation.
  - xvii. Include 15,610 sqyd's of 12" thick gravel roads with geotextile fabric at the site at locations determined by Construction Manager. Include removal of temp roads.
  - xviii. Include Notes 1-7, 13-16, and 18 shown on C1.40 Demolition Plan

## III. ALLOWANCE:

- a. Include in Base Bid, an allowance for all labor, equipment, and materials (including trucking to and removal of spoils from the site) required for undercuts totaling 4,000 cubic yards. (Undercutting method and materials as described within specification section 31 05 00 – Common Work results for Earthwork - Outside Building Footprint and specification section 31 00 00 Earthwork for Building). Allowance shall be equal to the undercutting unit price provided times the quantity stated here. For approved quantities in excess of the Undercutting allowance, the Undercutting cost will be paid in accordance with the required Undercutting unit price. Any unused portion of the allowance shall be refunded to the owner as a credit at the end of the project

IV. UNIT PRICE (to be noted on bid form)

- a. Unit Price #1: Cost per Cubic Yard for Undercutting (as defined in 31 05 00 - Common Work Results for Earthwork (Outside Building Footprint) specifications, including removal and replacement, as well as all trucking to and removal of spoils from the site.

# **Work Package #1.03.A Concrete Foundations**

## **Bid Package #1**

This Work Package Contractor (Subcontractor) shall perform the listed work below in accordance with the Contract, Drawings, Specifications, and further clarifications and instructions below. The work shall include all labor, material, equipment, and required taxes as needed to complete the work. All Bidders shall include all fees and permit costs associated with this Work Package. The general building permit will be by the Construction Manager. The following information is intended to clarify the scope of work, not limit any portion of the Work Package.

J.P. Cullen & Sons, Inc. is acting as the Construction Manager. All references to the Construction Manager implies J.P. Cullen & Sons, Inc.

Specifications to Include:

Division 00 Procurement & Contracting Requirements

Division 01 General Requirements

Section 03 10 00 Concrete Formwork

Section 03 20 00 Reinforcing Steel

Section 03 30 00 Cast-in-place Concrete

Section 31 40 00 Underpinning

### **V. GENERAL REQUIREMENTS**

- a. Bidders shall include all labor, materials, equipment, and required taxes to furnish and install this work package.
- b. Reference Instruction to Bidders Section for all bidding requirements.
- c. All bids are to bid per plans and specifications prepared by Venture Architects. The scopes of work are for clarification only.
- d. All bidders shall include all fees and permit costs associated with this work package and provide copies of all permits for record. The general building permit will be by the Construction Manager.
- e. Subcontractors assigned to the Construction Manager will be required to required to sign the Construction Manager's subcontract, included in the specifications, without any modifications.
- f. Comply with the Construction Manager's safety policies including 6' fall protection. The Construction Manager's safety policy is available upon request.
- g. Subcontractors are to provide their own sets of plans for field use. The Construction Manager will provide plans electronically only (pdf format).
- h. All subcontractors are to assume and include any costs to complete the work in the scheduled durations and no additional costs will be awarded for overtime or shift work required to meet the stated schedule. All Subcontractors are to adhere to the project schedule.
- i. Subcontractors are to expect that their work will be performed in multiple mobilizations. No additional costs for mobilization will be accepted by the Construction Manager.
- j. All bidders shall participate in the Construction Manager's meetings including:
- k. Pre-Construction Meetings at project start up
- l. Pre-installation Meetings before each construction activity that requires coordination with other contractors.

- m. Daily End of Shift Meeting at the end of each workday. Attendance and participation in these meetings are mandatory for all subcontractors working onsite.
- n. Weekly Progress Meetings
- o. Safety Meetings
- p. The Subcontractor is responsible for field measurements, coordination, receiving, unloading, inspecting, and storage of their materials. Materials shall be brought on site with the coordination of the Construction Manager. Materials brought onsite early may require relocation to maintain the efficiency of other trades.
- q. Subcontractors are responsible to protect existing buildings from any damage for their work.
- r. All bidders shall include cleaning of their work areas daily and removal of debris to the dumpsters provided by Construction Manager. Any debris left on site will be cleaned by the Construction Manager and back-charged to the appropriate party.
- s. All Subcontractors shall include layout for their own work.
- t. Subcontractors are to provide their own equipment as required to perform their work unless noted otherwise.
- u. If there is a valid reason that the Subcontractor must use equipment other than electrically powered, subcontractors are responsible for the ventilation of that equipment which is subject to approval by the Construction Manager.
- v. Subcontractors are required to provide their own flagmen for deliveries to the site as required.
- w. Subcontractors must provide their own extension cords. If temporary power greater than 120 v and 10 amps is required, subcontractors must provide hookups or generators.
- x. Each Subcontractor is to provide their own heat and weather protection for their own scope of work.
- y. Subcontractors are to provide daily reports to the Construction Manager. These reports are to include all work and subcontractors involved in working under their Subcontract. Daily reports are to include description of work being performed, progress, crew size, and safety concerns.
- z. Subcontractors are to provide weekly updated work schedules to the Construction Manager for all work to be performed in the following two weeks under their scope of work.
- aa. Subcontractors will present to the Construction Manager a detailed operation plan prior to commencing any work as identified by the Construction Manager. The plan will include a detailed schedule of the work, manpower, loading, equipment required, site layout plans, and safety plan.
- bb. Subcontractors are to provide on a weekly basis the copies of their weekly safety toolbox talk and sign in sheet(s).
- cc. Subcontractors are to provide mockups, as specified, at no additional cost.
- dd. Subcontractors are to provide a full time and competent superintendent. The Superintendent must be a person with decision-making authority for the subcontractor.
- ee. Subcontractors shall include penetrations for their work.
- ff. Subcontractors shall include firestopping as required for their penetrations.
- gg. Subcontractors should include protection of their work from damages.
- hh. Subcontractors will review the full bid documents to insure they have all the demolition and removals required for their work.
- ii. Subcontractors will review existing conditions and account for them in their bid.
- jj. All Subcontractors are to take the necessary precautions, perform testing, and have a program in place for Hazardous Material safety unless it can be verified that existing items to be removed or demolished contain no Hazardous Materials.

VI. WORK PACKAGE SPECIFIC

1. Cleaning of streets from contractor's equipment as directed by the Construction Manager.
2. Subcontractors shall include concrete foundations as shown on Structural drawings. Installation of all concrete work including but not limited to footings and foundation walls.
3. Furnish and install all required foundation insulation.
4. Coordinate & hire all required testing with testing agency(cies).
5. All costs associated with temporary heat/ weather protection as required to meet the Construction Manager's schedule.
6. Any equipment, enclosures and fuel required for this Work Package.
7. Fine grading for all concrete work
8. Coordination with MEPF trades and excavation contractors.
9. Coordination of sleeves by other trades.
10. Install anchor bolts and grout base plates, furnished by others. Install embeds furnished by others. Install sleeves furnished & laid out by others. Anchor bolts shall be verified for dimensional accuracy at completion of installation & prior to steel erection.
11. Drill and Epoxy dowels into existing as required.
12. Furnish and install rebar dowels as required at masonry walls. If not indicated on drawings includes #6 bar at 8"o.c. to height of 48" A.F.F.
13. Sump pit at elevator.
14. Dewatering after rain events to keep work area dry shall be included in this package.
15. Elevator wall and slab membrane waterproofing, waterstop.
16. Protection of sub-grade from freezing in preparation for slab pours.
17. Bidder shall include all hoisting and rigging for their work.
18. All required reinforcing rebar in concrete including wire mesh, dowels, bricks & rebar supports
19. Furnish access roads or crane pads needed to access work zone
20. Include insulation against interior side of foundation walls vertically only (033000-10,D)
21. Concrete wash out dumpster included. General trash dumpster provided by others. No stockpiling of wash out concrete allowed.
22. Include underpinning as required per Keyed Note 3 on S1.11 and detail 10/S5.1.
23. Subcontractor shall include all escalation costs as required for their work.
24. Subcontractor shall provide concrete formwork and reshoring drawings for all cast in place work.
25. By Others or Future Work
  - i. Expansion/Isolation Joints (033000-9,A)
  - ii. Slab on grade
  - iii. Under-slab vapor barrier (033000-10,C)
  - iv. Insulation below concrete slabs (033000-10,D)
  - v. Precast topping and concrete at metal pan stairs.



# Work Package # 01.05.A Steel Joists and Deck

## Material Bid Package #1

This Work Package Contractor (Subcontractor) shall perform the listed work below in accordance with the Contract, Drawings, Specifications, and further clarifications and instructions below. The work shall include all material and required taxes as needed to complete the work. The following information is intended to clarify the scope of work, not limit any portion of the Work Package.

J.P. Cullen & Sons, Inc. is acting as the Construction Manager. All references to the Construction Manager implies J.P. Cullen & Sons, Inc.

Specifications to Include:

Division 00 Procurement & Contracting Requirements

Division 01 General Requirements

Section 05 20 00 – Steel Joists

Section 05 30 00 – Metal Deck

### VII. GENERAL REQUIREMENTS

1. Bid prices must be held for a minimum of 30 days after the Bid Date.
2. All bids must be submitted utilizing the supplied bid form.
3. Multiple deliveries will be required per phasing plans. Deliveries must be scheduled 24 hours in advance. Delivery tickets to be sent 24 hours in advance.

### VIII. WORK PACKAGE SPECIFIC

- a. Furnish Joist, Decking & Anchor Bolts as shown on the Structural drawings dated 3/22/2022 and specifications. There will be a subsequent bid for misc. metals and structural steel not yet detailed.
- b. All material to be FOB jobsite.
- c. Joists delivery is required 1/5/2023. Joists to be single piece, no field splicing.
- d. Joists to be bid and designed to support all loads as currently identified on the construction documents. Joists to be primed as required by the specifications
- e. Include joist bridging and bridging connections.
- f. Fabricator is required to produce a 3D model in IFC format, including bar joists to LOD 350 per the BIM Forum LOD Specification. The model shall be shared with the Construction Manager at the time of shop drawing submittals.
- g. All shop drawings and calculations to be from Engineer licensed in State of Wisconsin.
- h. Furnish all mechanical deck fasteners and sidelap fasteners. Sidelap fasteners to be collated decking screws, Hilti Self-drilling screws, part #S-MD10-16x3/4" HWHS M9, or equal. Loose screws not acceptable.
- i. Include deck accessories, and deck closures as required.
- j. If required provide acoustical deck insulation and mesh stand offs as required.
- k. Include galvanizing, priming, or painting of deck as required.
- l. Provide mill certifications for all steel if requested.
- m. Furnish all anchor bolts per Base Plate designations on structural drawings and schedule on sheet S9.1

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

**DOCUMENT 00 31 32**

**GEOTECHNICAL DATA**

**1.1 INVESTIGATION**

- A. Geotechnical investigations were conducted at the site, the results of which can be reviewed directly after this Specification Section in the Project Manual.

**1.2 INTERPRETATION**

- A. The report is provided only for bidder's information and convenience and is not part of the Contract Documents. Owner and Architect do not warrant the accuracy or extent of the report or locations of the test borings.
- B. Zimmerman Architectural Studios, Inc. assumes no liability or responsibility for the preparation or content of Preliminary Geotechnical Exploration Report. All questions concerning Preliminary Geotechnical Exploration Report shall be directed to the Geotechnical Engineer as identified in within the report.
- C. The report is based upon the assumption that uniform variation exists in soil properties between borings. Interpretation of the report is bidder's responsibility. Owner and Architect will not be responsible for interpretation of report by bidders.
- D. Bidders are urged to examine the report and the site.
- E. Additional soil borings or other exploratory operations may be made by bidders at no additional cost to Owner, provided such operations are approved by Owner in advance.
- F. Refer to Conditions of the Contract for additional information.

**END OF SECTION**



Construction • Geotechnical  
Consulting Engineering/Testing

September 28, 2021  
C21424

Mr. Corey Beyer, AIA  
Venture Architects  
212 North 25<sup>th</sup> Street  
Milwaukee, WI 53233

Re: Geotechnical Exploration Report  
Rock County Jail and LES  
200 US Highway 14  
Janesville, Wisconsin

Dear Mr. Beyer:

Construction • Geotechnical Consultants, Inc. (CGC) has completed the subsurface exploration program for the above-referenced project. The purpose of this program was to evaluate the subsurface conditions within the proposed construction areas and to provide geotechnical recommendations regarding site preparation, foundation, floor slab and pavement design/construction. A determination of the site class for seismic design is also included, along with a preliminary discussion of the on-site stormwater infiltration potential. We are sending you an electronic copy of this report, and we can provide a paper copy upon request. An electronic copy is also being sent to Mr. Brad Seubert at Harwood Engineering Consultants.

### **PROJECT AND SITE DESCRIPTION**

We understand that building expansions are planned at the Rock County Jail and Law Enforcement Station (LES) in Janesville, Wisconsin. Site work is proposed to include new pavement areas and stormwater management features. The project areas currently contain paved at-grade parking lots and driveways, lawn-covered areas with scattered trees, as well as a farm field along US Highway 14. It is understood that a partial building demolition near the southwest end of the existing facility will be required to facilitate parts of the planned parking lot expansion. Based on publicly-available topographic data (City of Janesville Online GIS; 1-ft contour lines), existing site grades within the project limits vary to some degree, but are generally highest in the north and east and lowest in the south and west, with current ground surface elevations ranging between about EL 879 and 891 ft. Based on the contour lines shown in the City of Janesville Online GIS, and in the absence of further information pertaining to existing/planned building and site grades, we estimate the finished first floor elevation of the existing facility at about EL 889 to 890 ft.

The building additions are planned on the east/southeast and northwest sides of the existing facility, and we understand that the finished first floor elevations of the additions will match the existing building. As proposed building and site grades were not available to us at the time of this report, we have assumed a finished first floor elevation of about EL 889 to 890 ft. It is understood that the

planned building additions will generally be single-story, slab-on-grade structures (without basement). As an exception, a mezzanine and penthouse will be included in the east addition. Based on existing site grades and assumed building grades, we generally anticipate that finished floor slab grades will be established roughly at to slightly above current site grades, with the exception of the west end of the northwest addition where existing site grades are lower and more substantial fill, potentially on the order of up to 10 ft above current site grades, will be required to establish the building pad. New paved parking areas and drives are planned to the south, west and north of the facility, and we understand that stormwater management features are proposed in the far southern and western parts of the site. Site grades in some of the new pavement areas are anticipated to be raised to get closer to proposed (assumed) finished first floor grades.

### SUBSURFACE CONDITIONS

Subsurface conditions for this study were explored by drilling 53 Standard Penetration Test (SPT) soil borings (labeled B-1 through B-36 within the proposed building addition areas, planned boring depths of 25 ft below current site grades; P-1 through P-13 within proposed pavement areas, planned boring depths of 10 ft below current site grades; and SW-1 through SW-4 within/near the proposed stormwater management areas, planned boring depths of 15 ft below current site grades) at locations selected by the project team and marked in the field by CGC. A private utility locate was completed prior to commencing the soil borings. The borings were drilled by Soil Essentials (under subcontract to CGC) from August 30 through September 8, 2021 using a track-mounted Geoprobe 7822DT rotary drill rig equipped with hollow stem augers and an automatic SPT hammer. Planned boring depths were generally realized, except in Boring B-33 where auger and split-spoon refusal was experienced at about 13.8 ft below the ground surface on a probable large cobble or boulder interbedded with the native granular soils. The specific procedures used for drilling and sampling are described in Appendix A, and the boring locations are shown in plan on the Soil Boring Location Exhibit presented in Appendix B. Ground surface elevations at the boring locations were estimated by CGC based on 1-ft contour lines shown in the City of Janesville Online GIS, and the elevations should therefore be considered approximate (i.e., within about  $\pm 1$  ft).

The subsurface profiles at the boring locations varied to some degree, but the following strata were typically encountered (in descending order):

- Roughly 6 in. of **asphalt pavement** on top of about 4 in. of **base course**; or
- About 10 to 12 in. of **topsoil/topsoil fill**; underlain by
- Approximately 1 to 8 ft of **fill** in nearly half of the borings, consisting of stiff to hard clays, very loose to very dense silt, silty sand and sand/gravel, or a mixture of these soils; over
- Roughly 1 to 2 ft of **possible/probable buried topsoil** in Borings B-6, B-9, P-4, P-6 and P-9; followed by
- About 1 to 8 ft of predominantly stiff to hard (with isolated softer zones) **lean to silty clay** as well as mostly loose to medium dense (with occasional denser

- zones) *clayey sand* and *silt* to *sandy silt* strata in the majority of the borings; then
- Mostly medium dense to very dense *sand* and *gravel* deposits, also observed to contain scattered loose zones in upper portions, with variable silt content and scattered cobbles/boulders to the maximum depths explored

The relative densities of the granular (i.e., sand and gravel) and fine-grained (i.e., silt) soils were estimated based on SPT blow counts (N-values) in the soil borings. Note that the N-values shown on the left side of the boring logs (column “N”), which are attached in Appendix B, are not corrected for hammer efficiency or overburden stress. It must also be noted that fairly high N-values in some of the sand and gravel soils may be due to the high gravel content and/or the presence of cobbles/boulders. The consistency of the cohesive (i.e., clay) soils was estimated based on pocket penetrometer readings on the SPT samples, which are indicated on the right side of the boring logs [column “(q<sub>a</sub>)”]. The pocket penetrometer readings can be used as an estimate of the unconfined compressive strength of cohesive soils. Please refer to the individual boring logs for a more detailed description of the soil profiles.

As noted above, the existing fill was found to be highly variable in composition and strength, and occasional seams/pockets of *organics* or *topsoil*, as well as *brick fragments*, were also noted in a few of the fill samples obtained from the soil borings. As such, it appears that portions of the fill likely were not placed and compacted in a controlled/engineered manner, and should therefore be regarded as *undocumented*.

The clay and silt soils commonly encountered below the apparent fill, buried topsoil, or the surface layers (pavement section or topsoil) were generally native in appearance, but were classified as *possible fill* in the upper portions of isolated boring profiles (B-12, B-16, B-25 B-31, B-33 and P-2) due to somewhat inconsistent composition and/or coloration. Similarly, upper portions of the sand and gravel soils in Borings B-18 and B-28, present immediately below apparent shallow fill and the pavement section at these locations, respectively, were also characterized as *possible fill*.

Natural moisture contents in representative clay (fill and native) samples were found to range from 13.7% to 38.1%. Based on natural moisture contents, q<sub>a</sub> and N-values, the cohesive soils should generally be considered *slightly to moderately compressible*. The natural moisture contents are included on the boring logs attached in Appendix B (see the “W” column on the right).

Representative granular samples obtained from the Stormwater Borings SW-1, SW-2 and SW-4 were analyzed for their particle size distribution (gradation) to aid in their classification. Based on the gradations, with P200-contents (“fines”) of 6.5% to 11.1%, the samples classify as *poorly-graded to silty sand and gravel (SP-SM/GP-GM)*, and *extremely gravelly loamy sand to very gravelly sand (XGRL, VGRL)* per the Unified Soil Classification System (USCS) and the United States Department of Agriculture (USDA) classification system, respectively. The particle size distribution test reports are also attached in Appendix B. The Wisconsin Department of Safety & Professional Services

(WDSPS) *Soil and Site Evaluation – Storm* form for the four stormwater test pits is included in Appendix F.

Groundwater was not encountered in the borings during or upon the completion of drilling. Groundwater levels are expected to fluctuate with seasonal variations in precipitation, infiltration, evapotranspiration, the level in nearby waterbodies and other factors.

## DISCUSSION AND RECOMMENDATIONS

Subject to the limitations discussed below and based on the subsurface exploration, it is our opinion that the site is generally suitable for the planned expansion and that the proposed building additions can be supported by conventional shallow spread footing foundation systems, with the understanding that undercutting of existing fill, buried topsoil and marginal native soils will likely be required below the bottom of footings in some portions of the site. *In addition, we recommend that the fill required to establish western portions the northwest addition footprint be placed early in the construction process, followed by a time delay/settlement period, to allow the slightly to moderately compressible native soils to consolidate and settle under the weight of the new fill prior to beginning footing construction.* Our recommendations for site preparation, foundation, floor slab and pavement design/construction, along with our assessment of the site class for seismic design and a preliminary discussion of the on-site stormwater infiltration potential, are presented in the following subsections. Additional information regarding the conclusions and recommendations presented in this report is discussed in Appendix C.

### 1. Site Preparation

We recommend that topsoil and vegetation be stripped at least 10 ft beyond the proposed construction areas, including areas requiring fill beyond the building addition footprints and pavement limits. The topsoil can be stockpiled on-site and later re-used as fill in landscaped areas. As mentioned earlier, topsoil was generally about 10 to 12 in. thick in the borings, but variable topsoil thicknesses may be encountered between and beyond boring locations due to previous grading and agricultural activities. Trees and root zones should be removed from construction areas prior to or in conjunction with topsoil stripping.

We further recommend that existing pavement be removed from the planned building areas. In new pavement areas, where finished pavement grades will be established above existing grades, existing pavement can potentially remain in-place, provided it is broken up (i.e., pulverized/rubblized) prior to fill placement to promote drainage.

We understand that a southwestern portion of the existing building will be demolished to facilitate a parking lot expansion in that area. We recommend that existing structures be completely removed or be broken off to depths of at least 2 ft below planned pavement subgrades. Structural remnants below at least 2 ft from the new pavement subgrades can potentially remain in-place provided they

do not interfere with new utility construction, where required. Existing floor slabs remaining in-place below new pavement should also be broken up (rubblized) to facilitate drainage.

After building demolition, pavement removal and topsoil stripping, subgrades are generally anticipated to consist of variable fill or native clay soils. In areas remaining at-grade or where site grades need to be raised, we recommend that cohesive and fine-grained subgrades be statically recompacted (i.e., without vibration) and subsequently proof-rolled with a piece of heavy rubber-tire construction equipment, such as a loaded tri-axle dump truck, to check for soft/yielding areas. If soft/yielding areas are observed, these soils should be undercut and replaced with granular backfill compacted to at least 95% compaction based on modified Proctor methods (ASTM D1557) in accordance with our Recommended Compacted Fill Specifications presented in Appendix D. Alternatively, 3-in. dense graded base (DGB) that is placed in loose 10-in. lifts and compacted until deflection ceases can also be used to restore grades in undercut areas. Granular subgrades should be thoroughly recompacted with a vibratory smooth-drum roller, and zones that remain loose after recompaction should be undercut and replaced or stabilized as described above. Areas subsequently receiving fill should be checked for their pavement, floor slab and footing support suitability prior to fill placement, as applicable. *Based on the widespread presence of variable existing fill and shallow native clay soils, we recommend that the project budget include a generous contingency for subgrade improvement in planned pavement and floor slab areas.*

Following the development of a firm and stable subgrade, fill placement to establish site, pavement and building grades can proceed. To the extent possible, we recommend using granular soils (i.e., sands/gravels, including the native granular soils if selectively excavated and stockpiled) as structural fill within the building envelopes and upper 2± ft in pavement areas because these soils are relatively easy to place and compact in most weather conditions compared to clay/silt soils. Clay and silt soils excavated on-site are generally not recommended as structural fill because moisture conditioning by discing and drying (aeration) will likely be required to achieve desired compaction levels, which is highly weather-dependent (i.e., dry, warm and windy conditions) and could delay construction progress. In our opinion, clay/silt soils are best used as fill in landscaping or potentially as lower lifts in pavement areas provided the moisture contents can be sufficiently lowered from the natural states to facilitate compaction efforts. We recommend that structural fill be compacted to at least 95% based on modified Proctor methods (ASTM D1557) following Appendix D guidelines. Periodic field density tests should be taken by CGC staff within the fill to document the adequacy of compaction efforts.

It is understood that the finish first floor elevation of the slab-on-grade building additions will match the existing building, which we have estimated as about EL 889 to 890 ft. In light of this, we estimate that significant fill will be required to establish the building pad towards the west end of the northwest building addition, where site grades are currently as low as about EL 880 ft. With slightly to moderately compressible clay soils being present in this area, extending to approximately 4 ft below current site grades in Borings B-21 and 22, we recommend that the structural fill be placed early in the construction process to allow the slightly to moderately compressible clays to



consolidate and settle under the weight of the new fill prior to beginning footing construction. We recommend the full height of the fill be placed (*to floor slab subgrade elevation*), followed by a time delay/consolidation period on the order of about 6 to 8 weeks (potentially longer, pending the evaluation of survey data). Settlement platforms (see detail in Appendix E) or monitoring points should be established within this part of the building footprint to monitor settlement progress. The settlement monitoring points should be surveyed at the time of installation, immediately after the full height of the fill reaches the floor slab subgrade elevation, at least twice a week in the first two weeks after fill placement, and then weekly to bi-weekly thereafter until three consecutive sets of survey readings indicate that settlement has largely ceased. Foundation construction within the monitoring area can begin after the settlement data indicates that fill-induced settlement has largely ceased.

As an alternative to the settlement monitoring platforms discussed above (which are placed prior to the commencement of fill placement), the progress of the resulting consolidation settlement could be monitored by driving multiple #4 rebar vertically into the newly placed fill materials to a depth of at least 4 ft below grade after fill placement to achieve the design slab subgrade has been completed. The tops of the rebar should be surveyed immediately after fill placement is complete, then at least twice weekly for a period of about two weeks, and weekly to bi-weekly thereafter to monitor settlement. It is important to note that with this alternative, a portion of the anticipated consolidation settlement will likely occur during the filling operations. As a result, little (to potentially no) apparent settlement may be observed from survey readings completed after fill placement has been completed.

To eliminate the need for a consolidation period with settlement monitoring in the areas of the building footprint where significant fill is planned (i.e., more than about 5 ft above current site grades), consideration could also be given to mass-undercutting of the shallow cohesive soils (including any fill and buried topsoil) prior to raising grades. In this scenario, the fill should be placed on a thoroughly recompacted, native sand/gravel subgrade. We recommend that the full height of the fill be established before beginning footing construction.

## **2. Building Foundations**

We understand that the finished first floor elevation of the building additions will match the existing building, which we have assumed as about EL 889 to 890 ft. Finished site grades surrounding the building additions are generally expected to be established near the finished first floor elevation. We expect that perimeter footings will bear at frost depth, a minimum of 4 ft below finished site grades, with the potential for slightly shallower interior footings. Due to the considerable size of the expansion areas, a fairly wide range of existing fill, buried topsoil, native clay/silt soils and native granular soils is expected to be encountered at footing grades. Where site grades need to be raised significantly, such as in the western part of the northwest building addition, footings may also bear on newly-placed structural fill, in which case it is imperative that the soils at the base of the new fill be carefully evaluated for their foundation support suitability prior to fill placement.

The undocumented existing fill and buried topsoil layers are not considered suitable for foundation support due to the potential for long-term total and differential settlements in excess of typically tolerable levels. Based on the borings performed within the planned building areas, we anticipate that undercutting of existing fill and buried topsoil will be required near Borings B-6 through B-8, B-26, B-27 and B-36, generally north and south of the existing building, with undercut depths expected to be on the order of about 0.5 to 6.5 ft below assumed perimeter footing grades. Furthermore, we anticipate that some of the softer/looser native clay and silt soils will require undercutting below the bottom of fairly isolated footings (e.g., in the vicinity of Borings B-13, B-30 and B-34), and undercut depths are expected to be on the order of about 0.5 to 2 ft. In addition, where loose native sand/gravel soils are exposed at footing grades that cannot be recompacted satisfactorily, these soils will also require fairly shallow undercutting (i.e., about 2 to 3 ft below footing grades, followed by re-placing the sands in thoroughly recompacted lifts. *Note that the areas identified as likely requiring undercutting, as well as the estimated undercut depths, will need to be verified at the time of construction by a CGC field representative, and additional areas in need of undercutting and/or deeper undercuts may be identified during construction.*

Provided that unsuitable soils are undercut below the bottom of footings on an as-needed basis, followed by thorough recompaction of the undercut base and placement of well-compacted granular backfill, we recommend the following parameters be used for foundation design:

- Maximum net allowable bearing pressure: 3,000 psf
- Minimum foundation widths:
  - Continuous wall footings: 18 in.
  - Column pad footings: 30 in.
- Minimum footing depths below finish site grades:
  - Exterior/perimeter footings: 4 ft
  - Interior footings: no minimum requirement

*Where new footings are planned adjacent to existing building foundations, the effects of overlapping soil stresses must be considered, and the recommended maximum net allowable bearing pressure must not be exceeded. If the existing building footings are designed for a lower allowable bearing pressure, the lower bearing pressure will control the maximum allowable overlapping soil stresses. Care must also be exercised not to undermine the existing building foundations during new footing and undercut excavations.*

Recognizing that subsurface conditions will vary across the building footprints, footing subgrades should be checked by a CGC field representative to document that the subgrade soils are suitable for footing support or otherwise advise on corrective measures, such as undercutting. We recommend using a smooth-edged backhoe bucket for footing and undercut excavations. Where required, the base of undercut excavations should be widened beyond the footing edges at least 0.5 ft in each

direction for each foot of undercut depth for stress distribution purposes. Granular soils exposed at footing grade or at the bottom of undercut excavations should be thoroughly recompact with a large vibratory plate compactor or an excavator-mounted hoe-pack prior to backfilling and formwork/concrete placement to densify soils loosened during the excavation process. Soils potentially susceptible to disturbance from vibratory compaction (e.g., cohesive/fine-grained soils or sands with elevated moisture content) should be hand-trimmed. OSHA slope guidelines should be followed if workers need to enter footing excavations.

As previously discussed, we recommend that existing fill and buried topsoil layers be undercut and replaced below the bottom of footings. Undercutting will also be required where native clay soils with  $q_a$ -values of less than 1.5 tsf are present at and slightly below the bottom of footings designed for an allowable bearing pressure of 3,000 psf. Similarly, loose sand or silt soils that cannot be recompact satisfactorily should also be undercut if encountered at or slightly below footing grades. In order to re-establish footing grade in undercut areas, we recommend using granular backfill compacted to at least 95% compaction based on modified Proctor methods (ASTM D1557), in accordance with the Recommended Compacted Fill Specifications presented in Appendix D. Alternatively, 3-in. DGB that is placed in loose 10-in. lifts and compacted until deflection ceases can also be used to restore grades in undercut areas.

Provided the foundation design/construction recommendations discussed above are followed, *including early fill placement and subsequent settlement monitoring as discussed in the Site Preparation section*, we estimate that total and differential post-construction settlements should be on the order of 1.0 and 0.5 in., respectively.

### **3. Seismic Site Class**

In our opinion, the average soil properties in the upper 100 ft of the site (based on N-values projected to range between 15 and 50 blows/ft, on average, in the sand and gravel deposits underlying the site) may be characterized as a stiff soil profile. This characterization would place the site in Site Class D for seismic design according to the International Building Code and ASCE 7.

### **4. Floor Slabs**

We anticipate that floor slab subgrades will largely consist of existing, variable fill or native clay, or of newly-placed structural fill above current site grades where site grades need to be raised. Prior to slab construction, granular subgrade soils should be thoroughly recompact with a vibratory smooth-drum roller to densify soils that may become disturbed or loosened during construction activities. Cohesive and fine-grained subgrades will require static recompaction and subsequent proof-rolling. Contrary to foundation subgrades, it is our opinion that the existing fill can generally remain in-place below floor slab areas, provided the fill subgrades can be adequately recompact and perform satisfactorily during proof-rolling. Areas of disturbed soil, soft/yielding zones observed during proof-rolling, or soils that remain loose after recompact should be undercut and replaced

with compacted 3-in. DGB or granular fill. *Due to the wide-spread presence of existing fill and shallow clay soils, which are considered susceptible to disturbance from repetitive construction traffic and/or wet weather, some undercutting or stabilization of floor slab subgrades should generally be expected, and we recommend that the project budget include a generous contingency for floor slab subgrade improvement.*

To act as a capillary break below the slabs, we recommend including a minimum 4 to 6-in. thick layer of well-graded sand/gravel with less than 5% by weight passing the No. 200 U.S. standard sieve. Note, however, that some structural engineers require a layer of dense graded base, such as 1¼-in. DGB, rather than sand/gravel below the floor slabs to increase the subgrade modulus immediately below the slabs. To further reduce the potential for moisture migration through the slabs, a plastic vapor barrier can also be utilized. Fill and base layer material below the floor slabs should be placed as described in the Site Preparation section of this report. Slabs constructed on a minimum 6-in. thick DGB layer may be designed utilizing a subgrade modulus of 150 pci, and a subgrade modulus of 100 pci should be used for the design of slabs that are constructed on a sand/gravel layer. The design subgrade moduli are based on a firm or adequately stabilized, recompacted subgrade such that non-yielding conditions are developed. The slabs should be structurally separated from the footings with a compressible filler and have construction joints and reinforcement for crack control.

## **5. Pavement Design**

We anticipate that pavement design will be controlled by the existing fill and shallow clay soils, and subgrades should be prepared as described in the Site Preparation section of this report, with recompaction/proof-rolling completed prior to base course placement. *Based on the widespread presence of variable fill, as well as native clays with moisture contents up to about 38% near existing site grades, which are also assumed to be sensitive to moisture changes, we recommend that the budget include a generous contingency for subgrade undercutting/stabilization, which may involve about 12 in. of additional coarse aggregate (e.g., 3-in. DGB), potentially over biaxial geogrid (e.g., Tensar BX Type 1 or equivalent).* The areas requiring undercutting/stabilization and the depth of undercutting should be determined in the field by proof-rolling prior to installing the base course layer, and the need for undercutting/stabilization will likely depend on the weather conditions during construction, as the subgrade soils can be susceptible to disturbance/weakening from precipitation and repetitive construction traffic. The need for undercutting below the pavement section will likely be reduced where site grades are raised at least 2 ft above existing grade with high quality granular fill.

We anticipate that some asphalt pavement on this site, such as smaller parking areas (i.e., parking areas with less than 50 stalls) or low traffic volume-driveways, may primarily be exposed to automobile traffic with less than one 18-kip equivalent single axle load (ESAL) per day. In view of this, we have assumed Traffic Class I following Wisconsin Asphalt Pavement Association (WAPA) recommendations for smaller parking areas and driveways that are mainly used by light passenger

vehicles. However, main sections of driveways are likely to experience heavier traffic loads from truck traffic (e.g., garbage trucks), and we understand that some of the planned parking lots on this site are proposed to provide more than 50 stalls. For pavement areas where trucks will routinely travel and parking lots with 50 or more stalls, we have assumed a traffic load of up to 5 ESALs per day and Traffic Class II according to WAPA. We have also included a heavy-duty pavement section where higher truck traffic loads (up to 50 ESALs per day, Traffic Class III) may be experienced. The pavement sections summarized in Table 1 below were selected assuming a Soil Support Value “SSV” of about 4.0 for a firm or adequately stabilized fill/clay subgrade and a design life of 20 years.

**TABLE 1 – Recommended Pavement Sections**

Material	Thicknesses (in.)			WDOT Specification <sup>(1)</sup>
	Traffic Class I (Light Duty)	Traffic Class II (Medium Duty)	Traffic Class III (Heavy Duty)	
Bituminous Upper Layer <sup>(2,3)</sup>	1.75	1.75	2.0	Section 460, Table 460-1
Bituminous Lower Layer <sup>(2,3)</sup>	1.75	2.25	3.0	Section 460, Table 460-1
Dense Graded Base Course <sup>(2,4)</sup>	8.0	10.0	12.0	Sections 301 and 305
<b>Total Thickness</b>	<b>11.5</b>	<b>14.0</b>	<b>17.0</b>	

Notes:

- 1) Wisconsin DOT *Standard Specifications for Highway and Structure Construction*, latest edition, including supplemental specifications, and Wisconsin Asphalt Pavement Association *2020 Asphalt Pavement Design Guide*.
- 2) Compaction requirements:
  - Bituminous concrete: Refer to Section 460-3.
  - Base course: Refer to Section 301.3.4.2, Standard Compaction
- 3) Mixture Type LT bituminous; refer to Section 460, Table 460-2 of the *Standard Specifications*. Mixture type MT is recommended in heavy duty traffic areas. Note that an “H Grade” asphalt surface layer is recommended where there will be slow moving heavy truck traffic making turning movements.
- 4) The upper 4 in. should consist of 1¼-in. DGB; the bottom part of the layer can consist of 3-in. DGB.

The recommended pavement sections assume that regular maintenance (crack sealing, etc.) will occur, as needed. Note that if traffic volumes are greater than those assumed, CGC should be allowed to review the recommended pavement sections and adjust them accordingly. Alternative pavement designs may prove acceptable and should be reviewed by CGC. If there is a delay between subgrade preparation and placing the base course, the subgrade should be recompacted.

Where concrete pavement may be used, such as in pavement areas subjected to concentrated wheel loads (e.g., dumpster pads, etc.), we recommend that the concrete pavement be at least 6-in. thick, be underlain by at least 6 in. of DGB and contain adequate reinforcement for crack control. Concrete slabs underlain by a minimum 6-in. thick dense graded base layer over a firm or stabilized subgrade can be designed utilizing a subgrade modulus of 150 pci. Note that a thicker pavement section (more than 6 in. of concrete) may be required depending on pavement loads, which should be evaluated by a structural engineer.

## **6. Preliminary Stormwater Infiltration Discussion**

We understand that stormwater management features are proposed in the far southern and western parts of the site, and Borings SW-1 through SW-4 were performed in these areas to preliminarily evaluate the subsurface conditions with regard to their stormwater infiltration potential. The subsurface profiles in the four stormwater borings were fairly consistent in that they featured lower-permeability *silty clay loam*, *sandy clay loam* and *silt loam* strata (fill and native) in the upper about 2.5 to 4 ft, underlain by more permeable, granular deposits to the maximum depths explored. Provided that the bottom of the stormwater basins is established within the granular soils (or the shallow lower-permeability soils are undercut and replaced with appropriate sandier soils below the bottom of infiltration features), it is our opinion that some stormwater infiltration will generally be possible on this site.

It must be noted, however, that lower-permeability *silt loam* and *silty clay loam seams* were observed within some of the granular soils, and the lower-permeability seams are expected to control the vertical infiltration rate, where present. The infiltration potential in granular layers with *scattered* lower-permeability seams can likely be improved by excavating/turning over (i.e., deep-tilling) the granular soils to break up the lower-permeability seams to a sufficient depth below the bottom of the infiltration feature. *Thicker layers of clay and silt soils will require excavation and removal.*

**Infiltration Potential:** The following is a summary of the estimated infiltration rates for the soils encountered in Borings SW-1 through SW-4, per Table 2 of the WDNR Conservation Practice Standard 1002, *Site Evaluation for Storm Water Infiltration*. *Where lower-permeability soil (e.g., silt loam, silty clay loam, etc.) seams/layers exist within otherwise more permeable soils (e.g., granular, coarse-grained soils), the infiltration rate of the lower-permeability seams/layers will control the vertical infiltration rate, unless the lower-permeability seams are removed or the layer (with*



*scattered seams*) is excavated and blended, as discussed previously. The estimated infiltration rates are as follows:

• Silty clay loam (SiCL)	0.04 in./hr
• Sandy clay loam (SCL)	0.11 in./hr
• Silt loam (SiL)	0.13 in./hr
• Extremely gravelly sandy loam (XGRSL)	0.50 in./hr
• Extremely gravelly loamy sand (XGRLS)	1.63 in./hr
• Very gravelly sand (VGRS)	3.60 in./hr

Note that the infiltration rates should be considered approximate since they are merely based on soil texture and do not account for in-place soil density and other factors, which will affect the infiltration rate. *Infiltration rates in fill should be considered very approximate due to the potential for seams/layers of dissimilar material or variable composition.* We recommend that, at the time of construction, the soils at and several feet below the bottom of stormwater management systems be checked by a certified soil tester *in conjunction with the basin designer* to document that the soils are appropriate for the design infiltration rate or recommend remedial measures, if necessary. The Wisconsin Department of Safety & Professional Services *Soil and Site Evaluation – Storm* form for the four stormwater borings is contained in Appendix F.

It must be cautioned that the results of the soil borings have limitations with regard to the evaluation of the on-site stormwater infiltration potential, as actual soil horizon transitions may vary from those shown on the boring logs and infiltration form. The reviewing agency may require test pits to be excavated at a later date prior to finalizing the stormwater design. *The results of the test pits may require revisions to the stormwater management design if the design has been based solely on the soil borings.*

**Groundwater:** Groundwater was not encountered in the stormwater borings (or the site and building borings) performed for this study. Redoximorphic features (redox or mottling) observed within the shallow clay soils encountered in SW-3 are interpreted as a result of periodically infiltrating surface water, that may become retained in the lower-permeability soils for prolonged periods of time. Seasonal fluctuations of the groundwater table should be expected, as previously discussed.

**Bedrock:** Bedrock was not encountered in the borings performed for this study. The depth and consistency of bedrock should be expected to vary across the site.

During construction, appropriate erosion control should be provided to prevent eroded soil from contaminating the stormwater management areas. Where appropriate, the stormwater system design

should include pretreatment to remove fine-grained soils (silt/clay) and clogging materials (oils/greases) from stormwater prior to entering the infiltration areas. Additionally, a regular maintenance plan should be developed to remove silt/clay soils and clogging materials that may accumulate in the bottom of the stormwater management areas over time. Failure to adequately control fine-grained soils and clogging materials from entering the infiltration areas or failure to regularly remove fine-grained soils and clogging materials that accumulate at the base of the stormwater infiltration systems will likely cause the stormwater management systems to fail. Additionally, it is important that the soils in the bottom of the infiltration systems do not become compacted during construction or measures are taken to mitigate soils that are compacted during construction. Refer to WDNR *Conservation Practice Standards 1002, 1003 and 1004*, as well as *NR151* for additional information.

### CONSTRUCTION CONSIDERATIONS

Due to variations in weather, construction methods and other factors, specific construction problems are difficult to predict. Soil related difficulties which could be encountered on the site are discussed below:

- Due to the potentially sensitive nature of some of the on-site soils, we recommend that final site grading activities be completed during dry weather, if possible. Construction traffic should be avoided on prepared subgrades to minimize potential disturbance.
- Contingencies in the project budget for subgrade stabilization with coarse aggregate in pavement and floor slab areas should be increased if the project schedule requires that work proceed during adverse weather conditions.
- Earthwork construction during the late fall through early spring could be complicated as a result of wet weather and/or freezing temperatures. During cold weather, exposed subgrades should be protected from freezing before and after footing construction. Fill should never be placed while frozen or on frozen ground.
- Excavations extending greater than 4 ft in depth below the existing ground surface should be sloped or braced in accordance with current OSHA standards. The sand and gravel soils with fairly low amounts of fines (denoted SP, SP-SM, GP and GP-GM on the boring logs), typically classified as OSHA "Type C" soil, are anticipated to control excavation slopes, and slopes of 1.5H:1.0V are expected to be at least temporarily stable. Note that flatter side slopes may be required where perched or seeping water is present that destabilizes the side slopes. *The appropriate excavation side slopes should be determined by a competent person completing the earthwork in accordance with OSHA slope*



*guidelines.* Where adequate sloping is not possible, temporary shoring (earth retention) will be required. We recommend shoring systems be designed by an appropriately qualified professional engineer. *Care must be exercised not to undermine the existing building foundations during construction.*

- Based on the observations made during our field exploration, we do not anticipate groundwater to be encountered during construction. However, water accumulating at the bottom of excavations as a result of precipitation or seepage should be quickly removed, with dewatering means and methods being the contractor's responsibility.

### **RECOMMENDED CONSTRUCTION MONITORING**

The quality of the foundation, floor slab and pavement subgrades will be largely determined by the level of care exercised during site development. To check that earthwork and foundation construction proceed in accordance with our recommendations, the following operations should be monitored by CGC:

- Topsoil stripping and subgrade proof-rolling/compaction;
- Fill/backfill placement and compaction;
- Settlement progress based on survey data provided by others;
- Foundation excavation/subgrade preparation; and
- Concrete placement.

\* \* \* \* \*



Geotechnical Exploration Report  
Rock County Jail and LES  
CGC Project No. C21424  
September 28, 2021  
Page 15

It has been a pleasure to serve you on this project. If you have any questions or need additional consultation, please contact us.

Sincerely,

**CGC, Inc.**

A blue ink signature of Tim F. Gassenheimer, written in a cursive style.

Tim F. Gassenheimer, PE, CST  
Senior Staff Engineer

A black ink signature of Ryan J. Portman, written in a cursive style.

Ryan J. Portman, PE, CST  
Consulting Professional

Encl: Appendix A - Field Exploration  
Appendix B - Soil Boring Location Exhibit  
Logs of Test Borings (53)  
Particle Size Distribution Test Reports (4)  
Log of Test Boring-General Notes  
Unified Soil Classification System  
Appendix C - Document Qualifications  
Appendix D - Recommended Compacted Fill Specifications  
Appendix E - Settlement Platform  
Appendix F - WDSPP *Soil and Site Evaluation – Storm* Form

Cc: Mr. Brad Seubert, PE – Harwood Engineering Consultants, Ltd.

**APPENDIX A**  
**FIELD EXPLORATION**

## APPENDIX A

### FIELD EXPLORATION

Subsurface conditions for this study were explored by drilling 53 Standard Penetration Test (SPT) soil borings to depths between 10 and 25 ft below current site grades, which were generally sampled at 2.5-ft intervals to a depth of 10 ft and at 5-ft intervals thereafter. As an exception, the four Stormwater Borings SW-1 through SW-4 were sampled at 2.5-ft intervals to the final boring depth at 15 ft below current site grades. The samples were obtained in general accordance with specifications for standard penetration testing, ASTM D1586, and the specific procedures used for drilling and sampling are described below.

#### 1. Boring Procedures between Samples

The boring is extended downward, between samples, by a hollow-stem auger.

#### 2. Standard Penetration Test and Split-Barrel Sampling of Soils (ASTM Designation: D 1586)

This method consists of driving a 2-inch outside diameter split-barrel sampler using a 140-pound weight falling freely through a distance of 30 inches. The sampler is first seated 6 inches into the material to be sampled and then driven 12 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the log of borings and is known as the Standard Penetration Resistance.

During the field exploration, the driller visually classified the soil and prepared a field log. *Field screening of the soil samples for possible environmental contaminants was not conducted by the driller as these services were not part of CGC's work scope.* Water level observations were made in each boring during and after drilling and are shown at the bottom of each boring log. Upon completion of drilling, the borings were backfilled with bentonite to satisfy WDNr regulations and the soil samples were delivered to our laboratory for visual classification and laboratory testing. The soils were visually classified by a geotechnical engineer using the Unified Soil Classification System (USCS). Dual classification per the USCS and USDA classification system was provided by a certified soil tester for the four stormwater borings.

The final boring logs prepared by the engineer, including laboratory test results, along with a Soil Boring Location Exhibit and a description of the Unified Soil Classification System are presented in Appendix B. The WDSPPS *Soil and Site Evaluation – Storm* form for the stormwater borings is attached in Appendix F.

**APPENDIX B**

**SOIL BORING LOCATION EXHIBIT**

**LOGS OF TEST BORINGS (53)**

**PARTICLE SIZE DISTRIBUTION TEST REPORTS (4)**

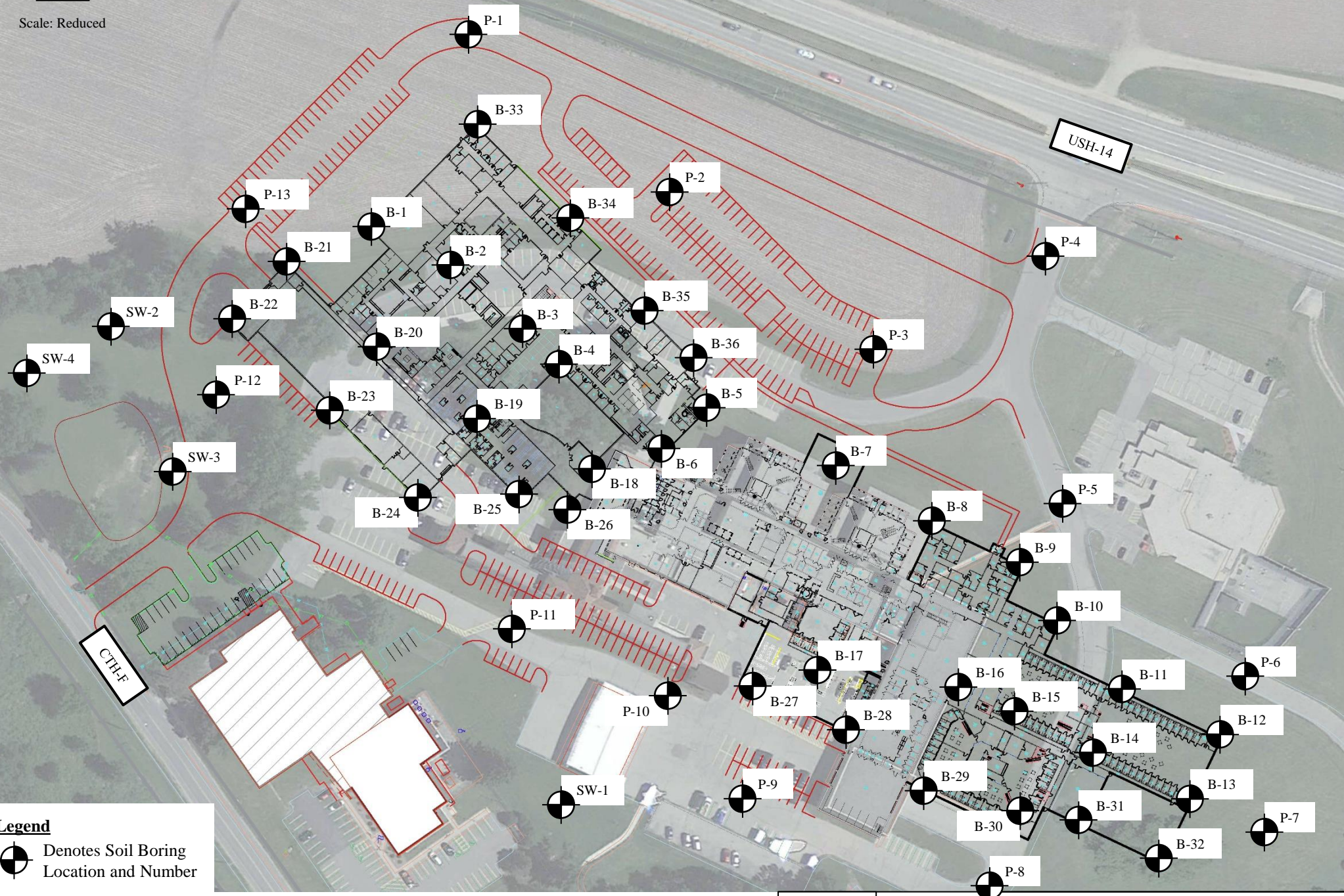
**LOG OF TEST BORING-GENERAL NOTES**

**UNIFIED SOIL CLASSIFICATION SYSTEM**






Scale: Reduced



#### Legend

 Denotes Soil Boring Location and Number

#### Notes

1. Borings were drilled by Soil Essentials from August 30 through September 8, 2021.
2. Boring locations are approximate.
3. Base map was prepared by Harwood Engineering Consultants.

Job No.:  
C21424

Date:  
09/2021

CGC, Inc.

**SOIL BORING LOCATION EXHIBIT**  
**Rock County Jail and LES**  
**200 US Highway 14**  
**Janesville, Wisconsin**



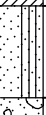







## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-01**  
Surface Elevation (ft) **887.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		12	M	6			Hard, Brown Silty CLAY, Little Sand, Trace Gravel (CL-ML)	(4.5+)				
2		14	M	22			Medium Dense, Tan Fine to Coarse SAND, Little Gravel, Trace to Little Silt (SP/SP-SM)					
					5							
3		5	M	99/3"			Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		12	M	61								
					10							
5		11	M	29								
					15							
6		13	M	26								
					20							
7		8	M	46								
					25							
End of Boring at 25 ft												
Borehole Backfilled with Bentonite Chips												

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **11.1'**

Start **9/2/21** End **9/2/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.







## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-02**  
Surface Elevation (ft) **886.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						 6± in. Asphalt Pavement / 4± in. Base Course					
1		12	M	4		 Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL)	(1.75-2.0)	28.0			
2		8	M	99/9"		 Very Stiff/Very Dense, Brown to Gray Sandy Lean CLAY to Clayey Fine to Medium SAND, Little Gravel (CL/SC)	(2.0-2.25)				
3		13	M	46		 Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		13	M	50							
5		14	M	46							
6		8	M	61							
7		6	M	57							
						End of Boring at 25 ft					
						Borehole Backfilled with Bentonite Chips and Asphalt Cold Patch					

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **10.1'**

Start **9/1/21** End **9/1/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.





## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-03**  
Surface Elevation (ft) **886.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
						12± in. TOPSOIL					
1		12	M	6		Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL)	(2.25-2.75)				
2		12	M	32							
					5	Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
3		12	M	32							
4		8	M	15							
					10						
5		13	M	44							
					15						
6		6	M	62							
					20						
7		10	M	48							
					25						
						End of Boring at 25 ft					
						Borehole Backfilled with Bentonite Chips					
WATER LEVEL OBSERVATIONS						GENERAL NOTES					
While Drilling <input checked="" type="checkbox"/> NW						Upon Completion of Drilling <input type="checkbox"/> NW					
Time After Drilling						Start 9/2/21 End 9/2/21					
Depth to Water						Driller SE Chief Tim Rig Geoprobe					
Depth to Cave in						Logger Tim Editor TFG 7822DT					
						Drill Method 2.25" HSA; Autohammer					
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.											













## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-04**  
Surface Elevation (ft) **886.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							10± in. TOPSOIL					
1		12	M	6			Hard, Gray/Brown (Mottled) Lean CLAY, Trace Sand (CL)	(4.5+)	20.1			
2		12	M	8			Loose, Gray/Orange Brown (Mottled) SILT, Trace to Little Sand (ML)					
					5							
3		15	M	34			Medium Dense to Very Dense, Gray to Tan to Brown Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		13	M	28								
					10							
5		2	M	65								
					15							
							Medium Dense, Tan Fine SAND, Trace to Little Silt (SP/SP-SM)					
6		10	M	26								
					20							
							Medium Dense, Grayish Brown Fine to Coarse SAND, Trace Silt and Gravel (SP)					
7		12	M	23								
					25							
						End of Boring at 25 ft						
						Borehole Backfilled with Bentonite Chips						

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **12.0'**

Start **9/1/21** End **9/1/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-05**  
Surface Elevation (ft) **888.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						10± in. TOPSOIL					
1		12	M	5		FILL: Very Stiff, Brown Lean Clay, Trace to Little Sand, Trace Gravel, Scattered Silty Sand Seams and Organic Pockets	(2.5-3.0)				
2		8	M	4		Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL)	(2.0-2.5)				
3		13	M	10		Medium Stiff, Brown Lean to Silty CLAY, Little Sand, Trace Gravel (CL/CL-ML)	(0.5-1.0)				
4		13	M	37		Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
5		12	M	39							
6		12	M	32							
7		10	M	32							
						End of Boring at 25 ft					
						Borehole Backfilled with Bentonite Chips					

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **13.1'**

Start **9/1/21** End **9/1/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-06**  
Surface Elevation (ft) **889.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						10± in. TOPSOIL					
1		8	M	4		FILL: Stiff, Brown/Gray (Mottled) Lean Clay, Trace to Little Sand, Trace Gravel, Scattered Silty Sand Seams and Organic Pockets	(1.0-1.25)	23.9			
2		4	M	6		Medium Stiff, Dark Gray to Black Lean CLAY, Some Gravel, Little Sand, Trace Organics (CL; Probable Buried Topsoil)	(1.0)				
3		10	M	8		Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL)	(2.0-3.25)	19.9			
4		14	M	12		Medium Dense, Brown Fine SAND, Little to Some Silt, Trace Gravel (SP-SM/SM)					
						Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
5		11	M	99/8"							
6		9	M	99/5"							
7		8	M	25							
						End of Boring at 25 ft					
						Borehole Backfilled with Bentonite Chips					

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **11.3'**

Start **9/1/21** End **9/1/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
200 US Highway 14  
Location **Janesville, Wisconsin**

Boring No. **B-07**  
Surface Elevation (ft) **888.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
						12± in. TOPSOIL					
1		14	M	6		FILL: Very Stiff, Brown Lean Clay, Little Sand and Gravel	(3.5-3.75)				
2		13	M	4			(2.25-2.75)				
3		12	M	42		Dense, Tan Fine to Medium SAND, Little to Some Gravel, Trace Silt (SP)					
4		13	M	30							
5		16	M	32							
6		10	M	36		Medium Dense to Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
7		8	M	29							
End of Boring at 25 ft											
Borehole Backfilled with Bentonite Chips											
WATER LEVEL OBSERVATIONS						GENERAL NOTES					
While Drilling <input checked="" type="checkbox"/> NW						Start 9/2/21 End 9/2/21					
Time After Drilling						Driller SE Chief Tim Rig Geoprobe					
Depth to Water						Logger Tim Editor TFG 7822DT					
Depth to Cave in 11.2'						Drill Method 2.25" HSA; Autohammer					
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.											



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
200 US Highway 14  
Location **Janesville, Wisconsin**

Boring No. **B-08**  
Surface Elevation (ft) **888.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						12± in. TOPSOIL					
1		12	M	7		FILL: Very Stiff, Brown Lean Clay, Trace Sand and Gravel, Intermixed with Topsoil	(3.0-3.5)	23.3			
2		2	M	5							
					5						
3		16	M	40		Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		15	M	49							
					10						
5		13	M	34							
					15						
6		12	M	65							
					20						
7		8	M	39							
					25						
End of Boring at 25 ft											
Borehole Backfilled with Bentonite Chips											

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ 8.2'

Start 9/3/21 End 9/3/21  
Driller SE Chief Tim Rig Geoprobe  
Logger Tim Editor TFG 7822DT  
Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-09**  
Surface Elevation (ft) **888.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		14	M	8			Loose, Dark Gray SILT, Trace Sand and Organics (ML; Possible Buried Topsoil)					
2		11	M	6			Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.5)				
					5							
3		12	M/W	6			Loose, Light Brown Sandy SILT, Little Gravel (ML)					
4		14	M	46			Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
					10							
5		5	M	26								
					15							
6		13	M	66								
					20							
7		8	M	44								
					25							
End of Boring at 25 ft												
Borehole Backfilled with Bentonite Chips												

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **10.2'**

Start **9/3/21** End **9/3/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
200 US Highway 14  
Location **Janesville, Wisconsin**

Boring No. **B-10**  
Surface Elevation (ft) **887.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						12± in. TOPSOIL					
1		14	M	4		Hard, Brown Silty CLAY, Trace Sand (CL-ML)	(4.0-4.5)	19.9			
2		12	M	8		Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.0-3.25)				
					5						
3		12	M/W	7		Loose, Light Brown/Light Gray (Laminated) Sandy SILT, Trace Gravel (ML)					
4		12	M	44		Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt, Scattered Silt Seams (SP/SP-SM)					
					10						
5		6	M	99/5"							
					15						
6		12	M	47							
					20						
7		12	M	50							
					25						
						End of Boring at 25 ft					
						Borehole Backfilled with Bentonite Chips					

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **12.2'**

Start **9/3/21** End **9/3/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.








## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-11**  
Surface Elevation (ft) **888.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		12	M	6			Very Stiff to Hard/Loose to Medium Dense, Light Brown Silty CLAY to SILT, Trace to Little Sand (CL-ML/ML)	(4.5+)				
2		13	M	11				(2.0-2.25)				
					5							
3		9	M	99/3"			Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		12	M	33								
					10							
5		13	M	59								
					15							
6		10	M	28								
					20							
							Medium Dense, Tan Fine to Coarse SAND, Little Gravel, Trace Silt (SP)					
7		12	M	25								
					25							
						End of Boring at 25 ft						
						Borehole Backfilled with Bentonite Chips						

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_

Start 9/7/21 End 9/7/21  
Driller SE Chief Tim Rig Geoprobe  
Logger Tim Editor TFG 7822DT  
Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.










## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-12**  
Surface Elevation (ft) **889.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						 12± in. TOPSOIL					
1		13	M	7		 Hard, Brown to Dark Gray Lean to Silty CLAY, Trace Sand and Organics (CL/CL-ML; Possible Fill)	(4.25-4.5)	21.8			
2		13	M	9		 Loose, Brown Fine to Coarse SAND, Some Silt, Little Gravel (SM)					
3		12	M	28		 Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		13	M	23							
5		10	M	53							
6		12	M	36							
7		11	M	44							
End of Boring at 25 ft											
Borehole Backfilled with Bentonite Chips											

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **9.9'**

Start **9/7/21** End **9/7/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-13**  
Surface Elevation (ft) **890.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		13	M	6			Hard, Brown Silty CLAY, Trace Sand (CL-ML)	(4.5+)				
2		13	M	7			Medium Stiff, Brown Lean CLAY, Trace Sand (CL)	(0.75-1.0)				
					5							
3		12	M	51			Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		11	M	31								
					10							
5		12	M	31								
					15							
6		11	M	34								
					20							
7		12	M	47								
					25							
End of Boring at 25 ft												
Borehole Backfilled with Bentonite Chips												

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **9.9'**

Start **9/7/21** End **9/7/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.








## LOG OF TEST BORING

Project **Rock County Jail and LES**  
200 US Highway 14  
Location **Janesville, Wisconsin**

Boring No. **B-14**  
Surface Elevation (ft) **888.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		13	M	6			Hard, Brown Silty CLAY, Trace Sand (CL-ML)	(4.5+)	19.4			
2		10	M	11			Medium Dense, Brown Fine SAND, Some Silt (SM)					
					5		Medium Dense, Tan Fine to Coarse SAND, Little Gravel, Trace to Little Silt (SP/SP-SM)					
3		13	M	54			Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		12	M	48								
					10							
5		12	M	25								
					15							
6		12	M	24								
					20							
7		12	M	34								
					25							
						End of Boring at 25 ft						
						Borehole Backfilled with Bentonite Chips						

### WATER LEVEL OBSERVATIONS

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ 10.2'

### GENERAL NOTES

Start 9/7/21 End 9/7/21  
Driller SE Chief Tim Rig Geoprobe  
Logger Tim Editor TFG 7822DT  
Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.







## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-15**  
Surface Elevation (ft) **888.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		8	M	33			FILL: Dense, Brown Gravelly Fine to Coarse Sand, Little to Some Silt					
2		16	M	8			Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(1.75-2.25)	24.0			
3		12	M	44			Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		13	M	59								
5		10	M	41								
6		6	M	35								
7		8	M	42								
							End of Boring at 25 ft					
							Borehole Backfilled with Bentonite Chips					

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **9.2'**

Start **9/7/21** End **9/7/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
200 US Highway 14  
Location **Janesville, Wisconsin**

Boring No. **B-16**  
Surface Elevation (ft) **890.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
						<div>10± in. TOPSOIL</div>						
1		11	M	10		<div>Very Stiff/Loose to Medium Dense, Brown Sandy Lean CLAY to Clayey Fine to Medium SAND, Some Gravel (CL/SC; Possible Fill)</div> <div>Loose to Medium Dense, Brown to Tan Fine to Coarse SAND, Little to Some Gravel, Trace Silt (SP)</div>	(3.25)					
2		8	M	7								
3		10	M	7								
4		12	M	7								
5		12	M	28								
6		12	M	30								
7		8	M	30								
End of Boring at 25 ft												
Borehole Backfilled with Bentonite Chips												

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ 8.2'

Start 9/7/21 End 9/7/21  
Driller SE Chief Tim Rig Geoprobe  
Logger Tim Editor TFG 7822DT  
Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.


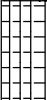



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
 Location **Janesville, Wisconsin**

Boring No. **B-17**  
 Surface Elevation (ft) **888.0±**  
 Job No. **C21424**  
 Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							6± in. Asphalt Pavement / 4± in. Base Course					
1		13	M	23			FILL: Medium Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt, and Brown Fine to Coarse Sand, Some Silt and Gravel					
2		6	M	4			Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL)	(2.25-3.0)	27.4			
					5							
3		12	M	27			Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		12	M	48								
					10							
5		10	M	40								
					15							
6		10	M	68								
					20							
7		10	M	62								
					25							
End of Boring at 25 ft												
Borehole Backfilled with Bentonite Chips and Asphalt Cold Patch												

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
 Time After Drilling \_\_\_\_\_  
 Depth to Water \_\_\_\_\_  
 Depth to Cave in \_\_\_\_\_ **10.8'**

Start **8/31/21** End **8/31/21**  
 Driller **SE** Chief **Tim** Rig **Geoprobe**  
 Logger **Tim** Editor **TFG** **7822DT**  
 Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-18**  
Surface Elevation (ft) **888.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							10± in. TOPSOIL					
1		12	M	16			FILL: Hard, Brown Lean Clay, Little Sand and Gravel	(4.5+)	13.7			
2		3	M	5			Loose to Dense, Tan Sandy Fine to Coarse GRAVEL, Trace Silt, Scattered Sandy Silt Seams (GP; Possible Fill)					
					5							
3		4	M	31								
4		13	M	38			Medium Dense to Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
					10							
5		12	M	35								
					15							
6		11	M	25								
					20							
7		12	M	28								
					25							
End of Boring at 25 ft												
Borehole Backfilled with Bentonite Chips												

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **11.9'**

Start **9/1/21** End **9/1/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

















## LOG OF TEST BORING

Project **Rock County Jail and LES**  
200 US Highway 14  
Location **Janesville, Wisconsin**

Boring No. **B-19**  
Surface Elevation (ft) **887.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						 12± in. TOPSOIL					
1		10	M	4		 Hard, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL)	(4.5)				
2		12	M	7		 Very Stiff to Hard, Light Brown/Gray (Mottled) Lean to Silty CLAY, Trace to Little Sand (CL/CL-ML)	(4.25-4.5)	18.1			
3		16	M	7		 Loose to Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)	(2.0-3.0)				
4		13	M	30							
											
5		4	M	25							
											
6		10	M	40							
											
7		6	M	31							
											
End of Boring at 25 ft											
Borehole Backfilled with Bentonite Chips											

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ 12.7'

Start 9/2/21 End 9/2/21  
Driller SE Chief Tim Rig Geoprobe  
Logger Tim Editor TFG 7822DT  
Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.






## LOG OF TEST BORING

Project **Rock County Jail and LES**  
200 US Highway 14  
Location **Janesville, Wisconsin**

Boring No. **B-20**  
Surface Elevation (ft) **887.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		12	M	6			Hard, Light Brown/Gray (Mottled) Lean to Silty CLAY, Trace to Little Sand (CL/CL-ML)	(4.5+)	18.4			
2		12	M	56								
					5		Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
3		12	M	99/7"								
4		11	M	99/9"								
					10							
5		12	M	37								
					15							
6		12	M	99/1"								
					20							
7		13	M	71								
					25							
End of Boring at 25 ft												
Borehole Backfilled with Bentonite Chips												

### WATER LEVEL OBSERVATIONS

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ 12.1'

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

### GENERAL NOTES

Start 8/30/21 End 8/30/21  
Driller SE Chief Tim Rig Geoprobe  
Logger Tim Editor TFG 7822DT  
Drill Method 2.25" HSA; Autohammer














## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-21**  
Surface Elevation (ft) **882.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		12	M	4			Very Stiff, Light Brown Lean CLAY, Little to Some Sand, Trace Gravel (CL)	(2.75-3.25)				
2		15	M	22			Loose to Medium Dense, Tan Fine SAND, Trace Silt and Gravel (SP)					
3		16	M	9			Medium Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		16	M	19								
												
5		10	M	20								
												
6		12	M	17								
												
7		10	M	25								
					25	End of Boring at 25 ft						
						Borehole Backfilled with Bentonite Chips						

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **12.9'**

Start **9/2/21** End **9/2/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.





## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-22**  
Surface Elevation (ft) **881.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		8	M	4			Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL)	(3.0-3.75)	26.1			
2		12	M	18			Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
					5							
3		3	M	99/3"								
4		12	M	22								
					10							
5		4	M	26								
					15							
6		10	M	22								
					20							
7		12	M	36								
					25							
End of Boring at 25 ft												
Borehole Backfilled with Bentonite Chips												

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **11.2'**

Start **9/2/21** End **9/2/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.





# LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
 Location **Janesville, Wisconsin**

Boring No. **B-23**  
 Surface Elevation (ft) **886.5±**  
 Job No. **C21424**  
 Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		10	M	7			Very Stiff, Brown Lean CLAY, Trace to Little Sand and Gravel (CL)	(2.5-2.75)				
2		12	M	31			Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
					5							
3		16	M	25								
4		12	M	27								
					10							
5		14	M	49								
					15							
6		12	M	50								
					20							
7		12	M	52								
					25							
							End of Boring at 25 ft					
							Borehole Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS						GENERAL NOTES			
While Drilling	∇	NW	Upon Completion of Drilling	NW		Start	9/2/21	End	9/2/21
Time After Drilling						Driller	SE	Chief	Tim
Depth to Water					▼	Logger	Tim	Editor	TFG
Depth to Cave in					12.5'	Drill Method	2.25" HSA; Autohammer		7822DT
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.									



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-24**  
Surface Elevation (ft) **887.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
						12± in. TOPSOIL					
1		7	M	3		Stiff to Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL)	(1.25-3.25)	38.1			
2		10	M	15		Medium Dense, Tan Fine SAND, Trace Silt and Gravel (SP)					
3		12	M	49		Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		11	M	65							
5		13	M	19							
6		11	M	34							
7		10	M	35							
End of Boring at 25 ft											
Borehole Backfilled with Bentonite Chips											
WATER LEVEL OBSERVATIONS						GENERAL NOTES					
While Drilling <input checked="" type="checkbox"/> NW Upon Completion of Drilling <input checked="" type="checkbox"/> NW						Start <b>8/30/21</b> End <b>8/30/21</b>					
Time After Drilling _____						Driller <b>SE</b> Chief <b>Tim</b> Rig <b>Geoprobe</b>					
Depth to Water _____						Logger <b>Tim</b> Editor <b>TFG</b> <b>7822DT</b>					
Depth to Cave in _____ <b>6.1'</b>						Drill Method <b>2.25" HSA; Autohammer</b>					
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.											





## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
 Location **Janesville, Wisconsin**

Boring No. **B-25**  
 Surface Elevation (ft) **887.0±**  
 Job No. **C21424**  
 Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						10± in. TOPSOIL					
1		12	M	5		Stiff to Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand, Scattered Sand/Gravel Seams (CL; Possible Fill)	(2.5-2.75)				
2		8	M	5			(1.5-1.75)	22.9			
3		10	M	23			(1.75-2.25)				
4		10	M	32		Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
5		10	M	70							
6		10	M	34							
						Dense, Grayish Brown Fine to Coarse SAND, Trace Silt and Gravel (SP)					
7		10	M	41							
End of Boring at 25 ft											
Borehole Backfilled with Bentonite Chips											

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
 Time After Drilling \_\_\_\_\_  
 Depth to Water \_\_\_\_\_  
 Depth to Cave in \_\_\_\_\_ **7.1'**

Start **8/30/21** End **8/30/21**  
 Driller **SE** Chief **Tim** Rig **Geoprobe**  
 Logger **Tim** Editor **TFG** **7822DT**  
 Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-26**  
Surface Elevation (ft) **887.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						10± in. TOPSOIL					
1		12	M	11		FILL: Hard, Brown to Dark Grayish Brown Lean to Silty Clay, Little to Some Sand, Trace Gravel and Organics	(4.5+)	16.5			
2		12	M	4		Stiff, Brown/Gray (Mottled) Lean CLAY, Trace Sand (CL)	(1.5-1.75)	28.0			
3		12	M	34		Very Stiff/Loose to Dense, Dark Brown Sandy Lean CLAY to Clayey Fine to Coarse SAND, Little Gravel (CL/SC)	(2.0-2.25)				
4		14	M	30		Medium Dense to Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
5		12	M	18							
6		12	M	32							
7		10	M	26							
End of Boring at 25 ft											
Borehole Backfilled with Bentonite Chips											

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_

Start 9/1/21 End 9/1/21  
Driller SE Chief Tim Rig Geoprobe  
Logger Tim Editor TFG 7822DT  
Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.












## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-27**  
Surface Elevation (ft) **887.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							6± in. Asphalt Pavement / 4± in. Base Course					
1		12	M	13			FILL: Medium Dense, Brown Fine to Coarse Sand, Some Silt and Gravel, Scattered Organic Seams					
2		6	M	9			FILL: Very Loose to Loose, Tan Gravelly Fine to Coarse Sand, Trace to Little Silt, Intermixed with Stiff, Brown Lean Clay, Trace Sand, Scattered Brick Fragments					
					5							
3		8	M	2				(1.0-1.25)				
4		12	M	29			Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
					10							
5		12	M	25								
					15							
6		7	M	99/1"								
					20							
7		2	M	99/7"								
					25							
End of Boring at 25 ft												
Borehole Backfilled with Bentonite Chips and Asphalt Cold Patch												

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **8.1'**

Start **8/31/21** End **8/31/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-28**  
Surface Elevation (ft) **889.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887






SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
						6± in. Asphalt Pavement / 4± in. Base Course					
1		13	M	21		Loose to Medium Dense, Tan Gravelly Fine to Coarse SAND, Some Silt (SM; Possible Fill)					
2		1	M	7							
3		12	M	4							
4		10	M	19		Loose to Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt, Scattered Clay/Silty Sand Seams in Upper Part of Layer (SP/SP-SM)					
5		13	M	25							
6		10	M	32							
7		10	M	33							
End of Boring at 25 ft											
Borehole Backfilled with Bentonite Chips and Asphalt Cold Patch											
WATER LEVEL OBSERVATIONS						GENERAL NOTES					
While Drilling <input checked="" type="checkbox"/> NW Upon Completion of Drilling <input checked="" type="checkbox"/> NW						Start 8/31/21 End 8/31/21					
Time After Drilling						Driller SE Chief Tim Rig Geoprobe					
Depth to Water						Logger Tim Editor TFG 7822DT					
Depth to Cave in 13.2'						Drill Method 2.25" HSA; Autohammer					
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.											

# LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
 Location **Janesville, Wisconsin**

Boring No. **B-29**  
 Surface Elevation (ft) **889.5±**  
 Job No. **C21424**  
 Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						 6± in. Asphalt Pavement / 4± in. Base Course					
1		10	M	10		FILL: Loose to Medium Dense, Tan Gravelly Fine to Coarse Sand, Trace to Little Silt					
2		12	M	4							
					5	 Stiff to Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL)	(1.75-2.25)	30.3			
3		11	M/W	5		 Stiff/Loose, Light Brown/Gray (Lightly Mottled) Silty CLAY to SILT, Trace to Little Sand (CL-ML/ML)	(1.25-2.0)	15.3			
4		13	M	24		 Medium Dense, Tan Fine SAND, Trace to Little Silt (SP/SP-SM)					
					10						
						 Medium Dense to Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
5		13	M	24							
					15						
6		8	M	26							
					20						
7		8	M	34							
					25						
						End of Boring at 25 ft					
						Borehole Backfilled with Bentonite Chips and Asphalt Cold Patch					

## WATER LEVEL OBSERVATIONS

While Drilling	<u>  </u> NW	Upon Completion of Drilling			<u>  </u> NW
Time After Drilling	_____	_____	_____	_____	_____
Depth to Water	_____	_____	_____	_____	_____
Depth to Cave in	_____	_____	_____	_____	<b>7.5'</b>

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start	<b>8/31/21</b>	End	<b>8/31/21</b>	
Driller	<b>SE</b>	Chief	<b>Tim</b>	Rig <b>Geoprobe</b>
Logger	<b>Tim</b>	Editor	<b>TFG</b>	<b>7822DT</b>
Drill Method	<b>2.25" HSA; Autohammer</b>			




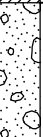






## LOG OF TEST BORING

Project **Rock County Jail and LES**  
200 US Highway 14  
Location **Janesville, Wisconsin**

Boring No. **B-30**  
Surface Elevation (ft) **889.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		14	M	5			Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.0-2.25)	26.1			
2		16	M/W	4			Soft to Medium Stiff, Brown Lean to Silty CLAY, Little Sand, Trace Gravel (CL/CL-ML)	(0.5)	20.1			
					5							
3		13	M	36			Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		13	M	46								
					10							
5		13	M	45								
					15							
6		11	M	30								
					20							
7		10	M	35								
					25							
End of Boring at 25 ft												
Borehole Backfilled with Bentonite Chips												

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **9.2'**

Start **9/7/21** End **9/7/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-31**  
Surface Elevation (ft) **889.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
					12± in. TOPSOIL					
1		13	M	6	Very Stiff, Brown to Dark Gray Lean to Silty CLAY, Trace Sand and Organics (CL/CL-ML; Possible Fill)	(2.25-3.75)				
2		13	M	35	Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
3		12	M	41						
4		14	M	51						
5		12	M	33						
6		12	M	39						
7		10	M	40						
					End of Boring at 25 ft					
					Borehole Backfilled with Bentonite Chips					

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **8.2'**

Start **9/7/21** End **9/7/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.






## LOG OF TEST BORING

Project **Rock County Jail and LES**  
200 US Highway 14  
Location **Janesville, Wisconsin**

Boring No. **B-32**  
Surface Elevation (ft) **890.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		12	M	8			Hard/Loose, Light Brown Silty CLAY to SILT, Trace to Little Sand, Trace Gravel (CL-ML/ML)	(4.5+)	15.8			
2		11	M	39			Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
					5							
3		13	M	28								
4		14	M	44								
					10							
5		12	M	24								
					15							
6		12	M	32								
					20							
7		11	M	51								
					25							
End of Boring at 25 ft												
Borehole Backfilled with Bentonite Chips												

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **11.1'**

Start **9/7/21** End **9/7/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-33**  
Surface Elevation (ft) **889.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						12± in. TOPSOIL					
1		6	M	7		Hard, Brown to Dark Gray Lean to Silty CLAY, Trace Sand and Organics (CL/CL-ML; Possible Fill)	(4.5+)				
2		14	M	15		Very Stiff, Brown Silty CLAY, Little Sand, Trace Gravel (CL-ML)	(2.0-2.5)	14.8			
3		13	M	49		Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		12	M	46							
5		1	M	99/3"		End of Boring/Auger and Split-Spoon Refusal on Probable Cobble/Boulderat 13.8 ft					
						Borehole Backfilled with Bentonite Chips					

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **6.1'**

Start **9/3/21** End **9/3/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
200 US Highway 14  
Location **Janesville, Wisconsin**

Boring No. **B-34**  
Surface Elevation (ft) **888.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
					12± in. TOPSOIL					
1		13	M	8	Hard/Loose, Light Brown Silty CLAY to SILT, Trace to Little Sand (CL-ML/ML)	(4.5+)	16.3			
2		16	M	11	Medium Dense, Tan Fine SAND, Trace Silt and Gravel (SP)					
3		14	M	43	Medium Dense to Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		12	M	42						
5		14	M	28						
6		10	M	49						
7		10	M	48						
					End of Boring at 25 ft					
					Borehole Backfilled with Bentonite Chips					

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **12.9'**

Start **9/2/21** End **9/2/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.








## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-35**  
Surface Elevation (ft) **886.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							6± in. Asphalt Pavement / 4± in. Base Course					
1		13	M	7			Stiff to Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL)	(2.25-3.25)				
2		7	M	6				(1.75-2.5)	28.7			
					5		Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
3		10	M	24								
4		6	M	62								
					10							
5		12	M	99/5"								
					15							
6		7	M	99/7"								
					20							
7		12	M	48								
					25							
End of Boring at 25 ft												
Borehole Backfilled with Bentonite Chips and Asphalt Cold Patch												

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **11.2'**

Start **9/1/21** End **9/1/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **B-36**  
Surface Elevation (ft) **887.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
					6± in. Asphalt Pavement / 4± in. Base Course					
1		8	M	23	FILL: Medium Dense, Tan Fine to Coarse Gravel, Some Silt and Sand					
2		12	M	5	Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL)	(2.25-3.0)	24.5			
3		13	M/W	11	Medium Dense, Grayish Brown Fine to Medium SAND, Some Silt and Gravel (SM)					
4		12	M	26	Medium Dense, Tan Fine SAND, Trace Silt and Gravel (SP)					
					Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
5		12	M	35	Medium Dense to Dense, Grayish Brown Fine to Coarse SAND, Trace Silt and Gravel (SP)					
6		10	M	31						
7		9	M	29						
					End of Boring at 25 ft					
					Borehole Backfilled with Bentonite Chips and Asphalt Cold Patch					

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **9.9'**

Start **9/1/21** End **9/1/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.







## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **P-01**  
Surface Elevation (ft) **889.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						 12± in. TOPSOIL					
1		10	M	4		 Hard, Brown Lean CLAY, Trace Sand (CL)	(4.0-4.5+)	19.7			
2		12	M	23		 Loose to Medium Dense, Light Brown Sandy SILT, Trace Gravel (ML)					
					5	 Medium Dense to Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
3		12	M	22							
4		12	M	40							
					10	End of Boring at 10 ft					
						Borehole Backfilled with Bentonite Chips					
					15						
					20						
					25						

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **6.1'**

Start **9/8/21** End **9/8/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.







## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **P-02**  
Surface Elevation (ft) **888.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						 12± in. TOPSOIL					
1		10	M	4		 Very Stiff to Hard, Brown to Dark Gray Lean to Silty CLAY, Trace Sand and Organics (CL/CL-ML; Possible Fill)	(3.5-4.5)	17.7			
2		13	M	26		 Loose to Medium Dense, Brown Fine SAND, Some Silt (SM)					
					5	 Medium Dense to Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
3		11	M	22							
4		12	M	41							
					10						
						End of Boring at 10 ft					
						Borehole Backfilled with Bentonite Chips					
					15						
					20						
					25						

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **6.1'**

Start **9/8/21** End **9/8/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



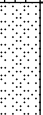
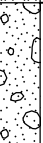


## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **P-03**  
Surface Elevation (ft) **888.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						 12± in. TOPSOIL					
1		12	M	5		 FILL: Hard, Brown to Dark Brown Lean Clay, Little Sand and Gravel, Trace Organics	(4.0-4.25)				
2		12	M	13		 Medium Dense, Tan Fine to Medium SAND, Little Gravel, Trace Silt (SP)					
					5						
3		12	M	29		 Medium Dense to Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		11	M	44							
					10						
						End of Boring at 10 ft					
						Borehole Backfilled with Bentonite Chips					
											</

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **6.2'**

Start **9/8/21** End **9/8/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.








## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
 Location **Janesville, Wisconsin**

Boring No. **P-04**  
 Surface Elevation (ft) **892.5±**  
 Job No. **C21424**  
 Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							6± in. Asphalt Pavement / 4± in. Base Course					
1		10	M	99/5"			FILL: Very Dense, Tan Gravelly Fine to Coarse Sand, Trace to Little Silt, and Dark Brown Fine to Coarse Sand, Some Silt and Gravel					
							Loose, Dark Brown Fine to Coarse SAND, Some Silt, Little Gravel, Trace Organics (SM; Possible Buried Topsoil)					
2		2	M	6			Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand and Gravel (CL)	(1.5-2.0)				
3		12	M	6								
4		10	M	55			Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
							End of Boring at 10 ft					
							Borehole Backfilled with Bentonite Chips and Asphalt Cold Patch					

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling NW  
 Time After Drilling \_\_\_\_\_  
 Depth to Water \_\_\_\_\_  
 Depth to Cave in \_\_\_\_\_ **5.1'**

Start **8/31/21** End **8/31/21**  
 Driller **SE** Chief **Tim** Rig **Geoprobe**  
 Logger **Tim** Editor **TFG** **7822DT**  
 Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.







## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **P-05**  
Surface Elevation (ft) **889.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							6± in. Asphalt Pavement / 4± in. Base Course					
1		14	M	43			FILL: Dense, Gray Sandy Fine to Coarse Gravel, Little to Some Silt, Scattered Silty Sand Seams					
2		13	M	3			Medium Stiff to Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL)	(1.75-2.5)				
					5							
3		12	M	4				(0.75-1.25)				
4		10	M	26			Medium Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
					10							
End of Boring at 10 ft												
Borehole Backfilled with Bentonite Chips and Asphalt Cold Patch												
					15							
					20							
					25							

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **5.2'**

Start **8/31/21** End **8/31/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.








## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **P-06**  
Surface Elevation (ft) **891.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						 6± in. Asphalt Pavement / 4± in. Base Course					
1		13	M	17		 FILL: Medium Dense, Tan Fine to Coarse Sand, Some Silt and Gravel (Dense Graded Base)	(2.5-3.5)				
						 Very Stiff, Black Organic CLAY, Trace to Little Sand (OL; Probable Buried Topsoil)					
2		3	M	4		 Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Little Sand (CL)	(2.0-2.25)				
					5						
3		13	M	32		 Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		12	M	41							
					10						
End of Boring at 10 ft											
Borehole Backfilled with Bentonite Chips and Asphalt Cold Patch											
					15						
					20						
					25						

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **5.1'**

Start **8/31/21** End **8/31/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.






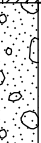



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **P-07**  
Surface Elevation (ft) **891.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		14	M	5			Very Stiff to Hard, Brown Lean CLAY, Trace Sand (CL)	(3.75-4.25)	22.8			
2		13	M	7			Stiff/Loose, Light Brown Silty CLAY to SILT, Little Sand (CL-ML/ML)	(1.25-1.5)				
					5							
3		12	M	26			Medium Dense to Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		13	M	42								
					10							
End of Boring at 10 ft												
Borehole Backfilled with Bentonite Chips												

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ 6.1'

Start 9/7/21 End 9/7/21  
Driller SE Chief Tim Rig Geoprobe  
Logger Tim Editor TFG 7822DT  
Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.









## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **P-08**  
Surface Elevation (ft) **888.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							6± in. Asphalt Pavement / 4± in. Base Course					
1		11	M	11			FILL: Medium Dense, Tan Fine to Coarse Sand, Some Silt and Gravel (Dense Graded Base)	(1.5-2.25)				
							Stiff to Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL)					
2		1	M/W	2			Soft, Brown Lean CLAY, Little Sand, Trace Gravel (CL)	(0.25-0.5)				
					5							
3		13	M	39			Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt, Scattered Clay Seams (SP/SP-SM)					
4		6	M	56								
					10							
End of Boring at 10 ft												
Borehole Backfilled with Bentonite Chips and Asphalt Cold Patch												
					15							
					20							
					25							

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ 6.1'

Start **8/30/21** End **8/30/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **P-09**  
Surface Elevation (ft) **887.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N		qu (qa) (tsf)	W	LL	PL	LI
					6± in. Asphalt Pavement / 4± in. Base Course					
1		10	M	7	FILL: Loose, Tan Gravelly Fine to Coarse Sand, Trace to Little Silt, Intermixed with Very Stiff, Grayish Brown Lean Clay, Some Sand, Little Gravel	(2.0-2.5)				
2		8	M	4	Very Loose to Loose, Dark Brown to Black SILT, Little Sand, Trace Organics (ML; Probable Buried Topsoil)					
3		12	M	5	Stiff, Brown Lean CLAY, Little Sand, Trace Gravel (CL)	(1.75-2.0)				
4		9	M	14	Medium Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt, Scattered Clay Seams (SP/SP-SM)					
					End of Boring at 10 ft					
					Borehole Backfilled with Bentonite Chips and Asphalt Cold Patch					

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **6.1'**

Start **8/30/21** End **8/30/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **P-10**  
Surface Elevation (ft) **887.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N		qu (qa) (tsf)	W	LL	PL	LI
					6± in. Asphalt Pavement / 4± in. Base Course					
1		10	M	9	FILL: Loose, Tan Gravelly Fine to Coarse Sand, Some Silt					
2		8	M	4	Stiff to Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL)	(1.75-2.25)				
3		10	M/W	5	Stiff, Brown Lean CLAY, Little Sand, Trace Gravel (CL)	(1.0-1.25)				
4		13	M	36	Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
					End of Boring at 10 ft					
					Borehole Backfilled with Bentonite Chips and Asphalt Cold Patch					

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **5.1'**

Start **8/30/21** End **8/30/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **P-11**  
Surface Elevation (ft) **886.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
					6± in. Asphalt Pavement / 4± in. Base Course					
1		10	W	7	FILL: Loose, Tan Fine to Coarse Sand, Some Silt and Gravel (Dense Graded Base)					
2		4	M	5	Stiff to Very Stiff, Brown Lean CLAY, Little Sand, Trace Gravel (CL)	(1.25-1.5)				
3		12	M	20	Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)	(2.0-2.75)				
4		12	M	68						
					End of Boring at 10 ft					
					Borehole Backfilled with Bentonite Chips and Asphalt Cold Patch					

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **5.0'**

Start **8/30/21** End **8/30/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.










## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **P-12**  
Surface Elevation (ft) **881.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		7	M	6			FILL: Loose, Brown to Dark Brown Sandy Silt, Some Gravel					
2		10	M	26			Medium Dense to Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
					5							
3		12	M	32								
												
4		10	M	41								
					10		End of Boring at 10 ft					
							Borehole Backfilled with Bentonite Chips					
					15							
					20							
					25							
					</							

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **5.1'**

Start **9/8/21** End **9/8/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.







## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **P-13**  
Surface Elevation (ft) **881.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL
						 12± in. TOPSOIL					
1		7	M	5		 FILL: Stiff to Very Stiff, Brown to Dark Brown Lean Clay, Little to Some Sand, Trace Gravel and Organics	(1.5-3.0)	24.4			
2		12	M	18		 Medium Dense, Brown to Tan Fine to Coarse GRAVEL, Some Silt and Sand (GM)					
					5						
3		10	M	27		 Medium Dense to Very Dense, Tan Gravelly Fine to Coarse SAND, Trace to Little Silt (SP/SP-SM)					
4		11	M	54							
					10						
						End of Boring at 10 ft					
						Borehole Backfilled with Bentonite Chips					

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **6.1'**

Start **9/8/21** End **9/8/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.






## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
 Location **Janesville, Wisconsin**

Boring No. **SW-1**  
 Surface Elevation (ft) **882.0±**  
 Job No. **C21424**  
 Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES						
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI	
							12± in. TOPSOIL						
1		13	M/W	5			Medium Stiff, Dark Brown Sandy Lean CLAY, Trace Gravel (CL) <i>USDA: 10YR 3/4 Sandy Clay Loam</i>	(0.5-0.75)					
2		10	M	22			Medium Dense to Very Dense, Light Brown Fine to Coarse SAND and GRAVEL, Trace to Little Silt (SP/SP-SM/GP/GP-GM) <i>USDA: 10YR 6/3 Extremely Gravelly Loamy Sand</i> P200 - Samples 2 and 3: 11.1% (composite)						
					5								
3		12	M	33						4.3			
4		12	M	33									
					10								
5		12	M	49									
6		11	M	99/9"									
					15	End of Boring at 15 ft							
						Borehole Backfilled with Bentonite Chips							
					20								
					25								

### WATER LEVEL OBSERVATIONS

While Drilling ☒ **NW** Upon Completion of Drilling **NW**  
 Time After Drilling \_\_\_\_\_  
 Depth to Water \_\_\_\_\_  
 Depth to Cave in \_\_\_\_\_ **7.1'**

### GENERAL NOTES

Start **9/7/21** End **9/7/21**  
 Driller **SE** Chief **Tim** Rig **Geoprobe**  
 Logger **Tim** Editor **TFG** **7822DT**  
 Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.





## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **SW-2**  
Surface Elevation (ft) **883.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE						VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N	Depth (ft)			qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		13	M	7			Loose, Brown SILT, Trace to Little Sand (ML) USDA: 10YR 5/3 Silt Loam					
2		12	M	52								
					5		Very Dense, Tan Fine to Coarse GRAVEL, Some Silt and Sand, Scattered Silt Seams (GM) USDA: 10YR 7/2 Extremely Gravelly Sandy Loam, Scattered Silt Loam Seams					
3		10	M	22			Medium Dense to Dense, Light Brown Fine to Coarse SAND and GRAVEL, Trace to Little Silt (SP/SP-SM/GP/GP-GM) USDA: 10YR 6/3 Extremely Gravelly Loamy Sand P200 - Samples 4 and 5: 7.7% (composite)					
4		8	M	37								
					10							
								2.4				
5		5	M	27								
6		6	M	44								
					15		End of Boring at 15 ft					
							Borehole Backfilled with Bentonite Chips					
					20							
					25							

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ 6.9'

Start 9/8/21 End 9/8/21  
Driller SE Chief Tim Rig Geoprobe  
Logger Tim Editor TFG 7822DT  
Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.








## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **SW-3**  
Surface Elevation (ft) **880.0±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		12	M	7			Hard, Brown/Gray (Lightly Mottled) Lean to Silty CLAY, Trace to Little Sand (CL/CL-ML) USDA: 10YR 5/3 (Redox: c1f 10YR 6/1) Silty Clay Loam	(4.5+)				
2		13	M	39								
					5		Dense, Light Brown Fine to Coarse SAND and GRAVEL, Trace to Little Silt, Scattered Silt Seams (SP/SP-SM/GP/GP-GM) USDA: 10YR 6/3 Extremely Gravelly Loamy Sand, Scattered Silt Loam Seams					
3		14	M	39								
4		10	M	25			Medium Dense to Dense, Dark Grayish Brown Fine to Coarse SAND and GRAVEL, Some Silt, Scattered Lean Clay Seams (SM/GM) USDA: 10YR 4/2 Extremely Gravelly Sandy Loam, Scattered Silty Clay Loam Seams					
					10							
5		10	M	40								
6		10	M	34			Dense, Light Brown Fine to Coarse SAND and GRAVEL, Some Silt (SM/GM) USDA: 10YR 6/3 Extremely Gravelly Sandy Loam					
					15							
						End of Boring at 15 ft						
						Borehole Backfilled with Bentonite Chips						
					20							
					25							

### WATER LEVEL OBSERVATIONS

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ 7.1'

### GENERAL NOTES

Start 9/8/21 End 9/8/21  
Driller SE Chief Tim Rig Geoprobe  
Logger Tim Editor TFG 7822DT  
Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



## LOG OF TEST BORING

Project **Rock County Jail and LES**  
**200 US Highway 14**  
Location **Janesville, Wisconsin**

Boring No. **SW-4**  
Surface Elevation (ft) **883.5±**  
Job No. **C21424**  
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N			Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
							12± in. TOPSOIL					
1		13	M	14			FILL: Hard, Dark Brown Sandy Lean Clay, Little Gravel	(4.5+)				
							USDA: 10YR 3/3 Sandy Clay Loam (Fill)					
2		12	M	52			Very Dense, Light Brown Fine to Coarse SAND and GRAVEL, Little to Some Silt (SM/GM)		3.1			
							USDA: 10YR 6/3 Extremely Gravelly Loamy Sand					
					5		P200 - Sample 2: 11.3%					
3		10	M	53								
4		8	M	30			Medium Dense to Dense, Brown Fine to Coarse SAND, Some Gravel, Trace to Little Silt (SP/SP-SM)		2.8			
							USDA: 10YR 5/4 Very Gravelly Sand					
					10		P200 - Sample 4: 6.5%					
5		10	M	29								
6		10	M	31								
					15		End of Boring at 15 ft					
							Borehole Backfilled with Bentonite Chips					
					20							

### WATER LEVEL OBSERVATIONS

While Drilling ☒ NW Upon Completion of Drilling ☒ NW  
Time After Drilling \_\_\_\_\_  
Depth to Water \_\_\_\_\_  
Depth to Cave in \_\_\_\_\_ **7.2'**

### GENERAL NOTES

Start **9/8/21** End **9/8/21**  
Driller **SE** Chief **Tim** Rig **Geoprobe**  
Logger **Tim** Editor **TFG** **7822DT**  
Drill Method **2.25" HSA; Autohammer**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	23.3	28.1	10.1	13.0	14.4	11.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.25	100.0		
1	88.6		
3/4	76.7		
1/2	65.1		
3/8	60.6		
#4	48.6		
#8	40.2		
#10	38.5		
#16	34.3		
#30	29.2		
#40	25.5		
#50	20.9		
#80	16.1		
#100	15.1		
#200	11.1		

\* (no specification provided)

## Material Description

Brown Sandy Fine to Coarse Gravel, Little Silt

## Atterberg Limits

PL=

LL=

PI=

## Coefficients

D<sub>90</sub>= 26.1297

D<sub>85</sub>= 23.4572

D<sub>60</sub>= 9.1650

D<sub>50</sub>= 5.1905

D<sub>30</sub>= 0.6535

D<sub>15</sub>= 0.1470

D<sub>10</sub>=

C<sub>u</sub>=

C<sub>c</sub>=

## Classification

USCS= GP-GM

AASHTO=

## Remarks

Sample Number: SW-1: S2 + S3

Date: 9/14/21

CGC, Inc.

Client: Venture Architects

Project: Rock Co. Jail

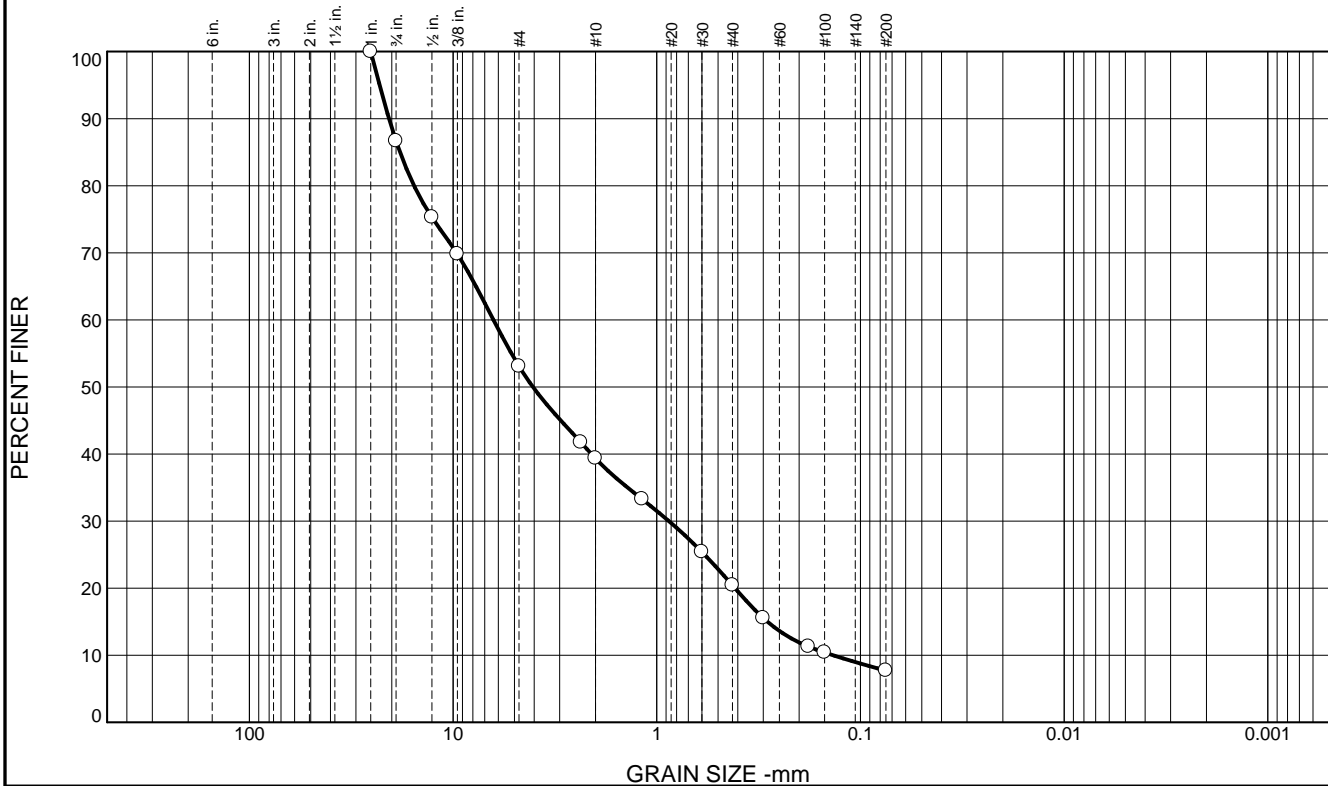
Project No: C21424

Figure

Tested By: DRW

Checked By: TFG

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	13.3	33.6	13.8	18.9	12.7	7.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
3/4	86.7		
1/2	75.3		
3/8	69.8		
#4	53.1		
#8	41.8		
#10	39.3		
#16	33.3		
#30	25.4		
#40	20.4		
#50	15.5		
#80	11.3		
#100	10.4		
#200	7.7		

\* (no specification provided)

**Material Description**  
Brown Sandy Fine to Coarse Gravel, Little Silt

**Atterberg Limits**  
PL= LL= PI=

**Coefficients**  
D<sub>90</sub>= 20.6286 D<sub>85</sub>= 18.2364 D<sub>60</sub>= 6.3376  
D<sub>50</sub>= 4.0575 D<sub>30</sub>= 0.8727 D<sub>15</sub>= 0.2863  
D<sub>10</sub>= 0.1365 C<sub>u</sub>= 46.45 C<sub>c</sub>= 0.88

**Classification**  
USCS= GP-GM AASHTO=

**Remarks**

Sample Number: SW-2: S4 + S5

Date: 9/14/21

**CGC, Inc.**

Client: Venture Architects

Project: Rock Co. Jail

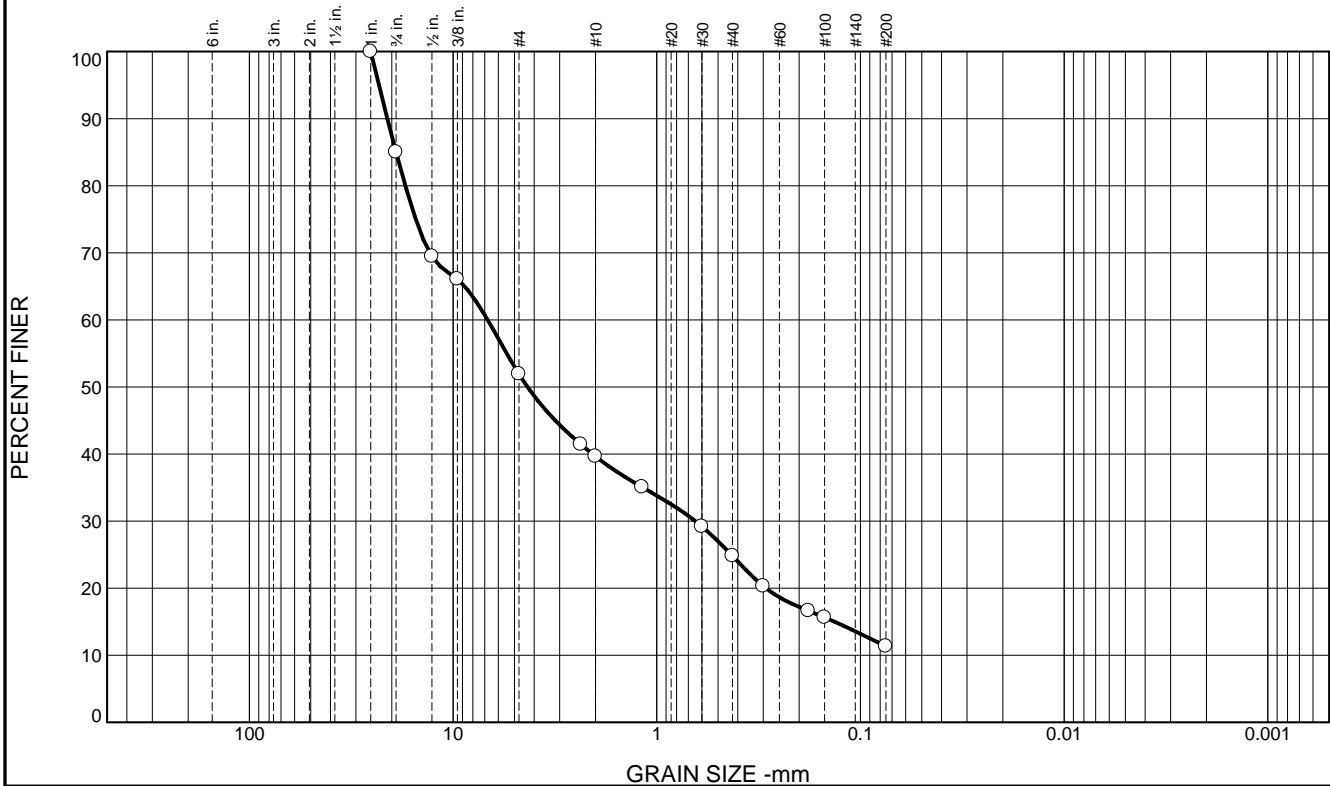
Project No: C21424

Figure

Tested By: DRW

Checked By: TFG

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	15.0	33.1	12.3	14.8	13.5	11.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
3/4	85.0		
1/2	69.5		
3/8	66.1		
#4	51.9		
#8	41.4		
#10	39.6		
#16	35.1		
#30	29.2		
#40	24.8		
#50	20.3		
#80	16.6		
#100	15.6		
#200	11.3		

\* (no specification provided)

Sample Number: SW-4: S2

Date: 9/14/21

## Material Description

Brown Sandy Fine to Coarse Gravel, Little Silt

## Atterberg Limits

PL=

LL=

PI=

## Coefficients

D<sub>90</sub>= 21.0203

D<sub>85</sub>= 19.0507

D<sub>60</sub>= 6.7694

D<sub>50</sub>= 4.3106

D<sub>30</sub>= 0.6470

D<sub>15</sub>= 0.1342

D<sub>10</sub>=

C<sub>u</sub>=

C<sub>c</sub>=

## Classification

USCS= GP-GM

AASHTO=

## Remarks

CGC, Inc.

Client: Venture Architects

Project: Rock Co. Jail

Project No: C21424

Figure

Tested By: DRW

Checked By: TFG

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.6	27.0	13.8	26.5	21.6	6.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
3/4	95.4		
1/2	85.5		
3/8	82.2		
#4	68.4		
#8	56.9		
#10	54.6		
#16	48.2		
#30	37.8		
#40	28.1		
#50	17.4		
#80	10.3		
#100	9.3		
#200	6.5		

\* (no specification provided)

Sample Number: SW-4: S4

Date: 9/14/21

## Material Description

Brown Fine to Coarse Sand, Some Gravel, Little Silt

## Atterberg Limits

PL=

LL=

PI=

## Coefficients

D<sub>90</sub>= 15.4071

D<sub>85</sub>= 12.2847

D<sub>60</sub>= 2.9342

D<sub>50</sub>= 1.3751

D<sub>30</sub>= 0.4517

D<sub>15</sub>= 0.2688

D<sub>10</sub>= 0.1716

C<sub>u</sub>= 17.09

C<sub>c</sub>= 0.41

## Classification

USCS= SP-SM

AASHTO=

## Remarks

CGC, Inc.

Client: Venture Architects

Project: Rock Co. Jail

Project No: C21424

Figure

Tested By: DRW

Checked By: TFG

## LOG OF TEST BORING General Notes

### DESCRIPTIVE SOIL CLASSIFICATION

#### Grain Size Terminology

Soil Fraction	Particle Size	U.S. Standard Sieve Size
Boulders .....	Larger than 12" .....	Larger than 12"
Cobbles .....	3" to 12" .....	3" to 12"
Gravel: Coarse.....	3/4" to 3" .....	3/4" to 3"
Fine.....	4.76 mm to 3/4" .....	#4 to 3/4"
Sand: Coarse.....	2.00 mm to 4.76 mm.....	#10 to #4
Medium .....	0.42 to mm to 2.00 mm .....	#40 to #10
Fine .....	0.074 mm to 0.42 mm.....	#200 to #40
Silt.....	0.005 mm to 0.074 mm.....	Smaller than #200
Clay.....	Smaller than 0.005 mm.....	Smaller than #200

Plasticity characteristics differentiate between silt and clay.

#### General Terminology

Physical Characteristics  
Color, moisture, grain shape, fineness, etc.  
Major Constituents  
Clay, silt, sand, gravel  
Structure  
Laminated, varved, fibrous, stratified,  
cemented, fissured, etc.  
Geologic Origin  
Glacial, alluvial, eolian, residual, etc.

#### Relative Density

Term	"N" Value
Very Loose.....	0 - 4
Loose.....	4 - 10
Medium Dense.....	10 - 30
Dense.....	30 - 50
Very Dense.....	Over 50

#### Relative Proportions Of Cohesionless Soils

Proportional Term	Defining Range by Percentage of Weight
Trace.....	0% - 5%
Little.....	5% - 12%
Some.....	12% - 35%
And .....	35% - 50%

#### Consistency

Term	q <sub>u</sub> -tons/sq. ft
Very Soft.....	0.0 to 0.25
Soft.....	0.25 to 0.50
Medium.....	0.50 to 1.0
Stiff.....	1.0 to 2.0
Very Stiff.....	2.0 to 4.0
Hard.....	Over 4.0

#### Organic Content by Combustion Method

Soil Description	Loss on Ignition
Non Organic.....	Less than 4%
Organic Silt/Clay.....	4 - 12%
Sedimentary Peat.....	12% - 50%
Fibrous and Woody Peat...	More than 50%

#### Plasticity

Term	Plastic Index
None to Slight.....	0 - 4
Slight.....	5 - 7
Medium.....	8 - 22
High to Very High ..	Over 22

The penetration resistance, N, is the summation of the number of blows required to effect two successive 6" penetrations of the 2" split-barrel sampler. The sampler is driven with a 140 lb. weight falling 30" and is seated to a depth of 6" before commencing the standard penetration test.

## SYMBOLS

### Drilling and Sampling

CS – Continuous Sampling  
RC – Rock Coring: Size AW, BW, NW, 2"W  
RQD – Rock Quality Designation  
RB – Rock Bit/Roller Bit  
FT – Fish Tail  
DC – Drove Casing  
C – Casing: Size 2 1/2", NW, 4", HW  
CW – Clear Water  
DM – Drilling Mud  
HSA – Hollow Stem Auger  
FA – Flight Auger  
HA – Hand Auger  
COA – Clean-Out Auger  
SS – 2" Dia. Split-Barrel Sample  
2ST – 2" Dia. Thin-Walled Tube Sample  
3ST – 3" Dia. Thin-Walled Tube Sample  
PT – 3" Dia. Piston Tube Sample  
AS – Auger Sample  
WS – Wash Sample  
PTS – Peat Sample  
PS – Pitcher Sample  
NR – No Recovery  
S – Sounding  
PMT – Borehole Pressuremeter Test  
VS – Vane Shear Test  
WPT – Water Pressure Test

### Laboratory Tests

q<sub>a</sub> – Penetrometer Reading, tons/sq ft  
q<sub>a</sub> – Unconfined Strength, tons/sq ft  
W – Moisture Content, %  
LL – Liquid Limit, %  
PL – Plastic Limit, %  
SL – Shrinkage Limit, %  
LI – Loss on Ignition  
D – Dry Unit Weight, lbs/cu ft  
pH – Measure of Soil Alkalinity or Acidity  
FS – Free Swell, %

### Water Level Measurement

▽ – Water Level at Time Shown  
NW – No Water Encountered  
WD – While Drilling  
BCR – Before Casing Removal  
ACR – After Casing Removal  
CW – Cave and Wet  
CM – Caved and Moist

Note: Water level measurements shown on the boring logs represent conditions at the time indicated and may not reflect static levels, especially in cohesive soils.



# CGC, Inc.

Madison - Milwaukee

## Unified Soil Classification System

### UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

#### COARSE-GRAINED SOILS

(more than 50% of material is larger than No. 200 sieve size)

##### Clean Gravels (Less than 5% fines)



GW

Well-graded gravels, gravel-sand mixtures, little or no fines



GP

Poorly-graded gravels, gravel-sand mixtures, little or no fines

##### Gravels with fines (More than 12% fines)



GM

Silty gravels, gravel-sand-silt mixtures



GC

Clayey gravels, gravel-sand-clay mixtures

##### Clean Sands (Less than 5% fines)



SW

Well-graded sands, gravelly sands, little or no fines



SP

Poorly graded sands, gravelly sands, little or no fines

##### Sands with fines (More than 12% fines)



SM

Silty sands, sand-silt mixtures



SC

Clayey sands, sand-clay mixtures

#### FINE-GRAINED SOILS

(50% or more of material is smaller than No. 200 sieve size.)



ML

Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity



CL

Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays



OL

Organic silts and organic silty clays of low plasticity



MH

Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts



CH

Inorganic clays of high plasticity, fat clays



OH

Organic clays of medium to high plasticity, organic silts



PT

Peat and other highly organic soils

### LABORATORY CLASSIFICATION CRITERIA

GW  $C_u = \frac{D_{60}}{D_{10}}$  greater than 4;  $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$  between 1 and 3

GP Not meeting all gradation requirements for GW

GM Atterberg limits below "A" line or P.I. less than 4  
 GC Atterberg limits above "A" line or P.I. greater than 7  
 Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols

SW  $C_u = \frac{D_{60}}{D_{10}}$  greater than 4;  $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$  between 1 and 3

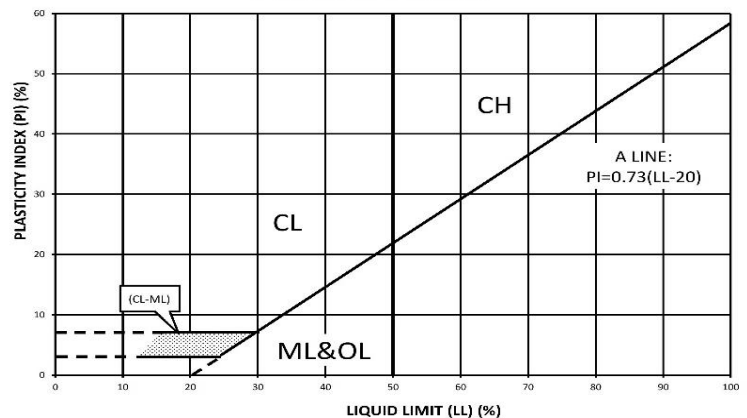
SP Not meeting all gradation requirements for GW

SM Atterberg limits below "A" line or P.I. less than 4  
 SC Atterberg limits above "A" line with P.I. greater than 7  
 Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent ..... GW, GP, SW, SP  
 More than 12 percent ..... GM, GC, SM, SC  
 5 to 12 percent ..... Borderline cases requiring dual symbols

### PLASTICITY CHART



## **APPENDIX C**

### **DOCUMENT QUALIFICATIONS**

## APPENDIX C

### DOCUMENT QUALIFICATIONS

---

#### I. GENERAL RECOMMENDATIONS/LIMITATIONS

---

CGC, Inc. should be provided the opportunity for a general review of the final design and specifications to confirm that earthwork and foundation requirements have been properly interpreted in the design and specifications. CGC should be retained to provide soil engineering services during excavation and subgrade preparation. This will allow us to observe that construction proceeds in compliance with the design concepts, specifications and recommendations, and also will allow design changes to be made in the event that subsurface conditions differ from those anticipated prior to the start of construction. CGC does not assume responsibility for compliance with the recommendations in this report unless we are retained to provide construction testing and observation services.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices and no other warranties are expressed or implied. The opinions and recommendations submitted in this report are based on interpretation of the subsurface information revealed by the test borings indicated on the location plan. The report does not reflect potential variations in subsurface conditions between or beyond these borings. Therefore, variations in soil conditions can be expected between the boring locations and fluctuations of groundwater levels may occur with time. The nature and extent of the variations may not become evident until construction.

---

#### II. IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT

---

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes. While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. *No one except you* should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

##### READ THE FULL REPORT

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

##### A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, *do not rely on a geotechnical engineering report* that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes - even minor ones - and request an assessment of their impact. *CGC cannot accept responsibility or liability for problems that occur because our reports do not consider developments of which we were not informed.*

##### SUBSURFACE CONDITIONS CAN CHANGE

A geotechnical engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

##### MOST GEOTECHNICAL FINDINGS ARE PROFESSIONAL OPINION

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgement to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ - sometimes significantly - from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most

effective method of managing the risks associated with unanticipated conditions.

#### **A REPORT'S RECOMMENDATIONS ARE NOT FINAL**

Do not over-rely on the confirmation-dependent recommendations included in your report. *Those confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgement and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *CGC cannot assume responsibility or liability for the report's confirmation-dependent recommendations if we do not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

#### **A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION**

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical engineering report. Confront that risk by having CGC participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

#### **DO NOT REDRAW THE ENGINEER'S LOGS**

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

#### **GIVE CONSTRUCTORS A COMPLETE REPORT AND GUIDANCE**

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

#### **READ RESPONSIBILITY PROVISIONS CLOSELY**

Some clients, design professionals, and constructors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic

expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineer's responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

#### **ENVIRONMENTAL CONCERNS ARE NOT COVERED**

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

#### **OBTAIN PROFESSIONAL ASSISTANCE TO DEAL WITH MOLD**

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention.* *Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

#### **RELY ON YOUR GEOTECHNICAL ENGINEER FOR ADDITIONAL ASSISTANCE**

Membership in the Geotechnical Business Council (GBC) of Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with CGC, a member of GBC, for more information.

Modified and reprinted with permission from:

Geotechnical Business Council  
of the Geoprofessional Business Association  
8811 Colesville Road, Suite G 106  
Silver Spring, MD 20910

## **APPENDIX D**

### **RECOMMENDED COMPACTED FILL SPECIFICATIONS**

## **APPENDIX D**

### **CGC, INC.**

#### **RECOMMENDED COMPACTED FILL SPECIFICATIONS**

##### **General Fill Materials**

Proposed fill shall contain no vegetation, roots, topsoil, peat, ash, wood or any other non-soil material which by decomposition might cause settlement. Also, fill shall never be placed while frozen or on frozen surfaces. Rock, stone or broken concrete greater than 6 in. in the largest dimension shall not be placed within 10 ft of the building area. Fill used greater than 10 ft beyond the building limits shall not contain rock, boulders or concrete pieces greater than a 2 sq ft area and shall not be placed within the final 2 ft of finish subgrade or in designated utility construction areas. Fill containing rock, boulders or concrete pieces should include sufficient finer material to fill voids among the larger fragments.

##### **Special Fill Materials**

In certain cases, special fill materials may be required for specific purposes, such as stabilizing subgrades, backfilling undercut excavations or filling behind retaining walls. For reference, WisDOT gradation specifications for various types of granular fill are attached in Table 1.

##### **Placement Method**

The approved fill shall be placed, spread and leveled in layers generally not exceeding 10 in. in thickness before compaction. The fill shall be placed at moisture content capable of achieving the desired compaction level. For clay soils or granular soils containing an appreciable amount of cohesive fines, moisture conditioning will likely be required.

It is the Contractor's responsibility to provide all necessary compaction equipment and other grading equipment that may be required to attain the specified compaction. Hand-guided vibratory or tamping compactors will be required whenever fill is placed adjacent to walls, footings, columns or in confined areas.

##### **Compaction Specifications**

Maximum dry density and optimum moisture content of the fill soil shall be determined in accordance with modified Proctor methods (ASTM D1557). The recommended field compaction as a percentage of the maximum dry density is shown in Table 2. Note that these compaction guidelines would generally not apply to coarse gravel/stone fill. Instead, a method specification would apply (e.g., compact in thin lifts with a vibratory compactor until no further consolidation is evident).

##### **Testing Procedures**

Representative samples of proposed fill shall be submitted to CGC, Inc. for optimum moisture-maximum density determination (ASTM D1557) prior to the start of fill placement. The sample size should be approximately 50 lb.

CGC, Inc. shall be retained to perform field density tests to determine the level of compaction being achieved in the fill. The tests shall generally be conducted on each lift at the beginning of fill placement and at a frequency mutually agreed upon by the project team for the remainder of the project.

**Table 1**  
**Gradation of Special Fill Materials**

Material	WisDOT Section 311	WisDOT Section 312	WisDOT Section 305			WisDOT Section 209		WisDOT Section 210
	Breaker Run	Select Crushed Material	3-in. Dense Graded Base	1 1/4-in. Dense Graded Base	3/4-in. Dense Graded Base	Grade 1 Granular Backfill	Grade 2 Granular Backfill	Structure Backfill
Sieve Size	Percent Passing by Weight							
6 in.	100							
5 in.		90-100						
3 in.			90-100					100
1 1/2 in.		20-50	60-85					
1 1/4 in.				95-100				
1 in.					100			
3/4 in.			40-65	70-93	95-100			
3/8 in.				42-80	50-90			
No. 4			15-40	25-63	35-70	100 (2)	100 (2)	25-100
No. 10		0-10	10-30	16-48	15-55			
No. 40			5-20	8-28	10-35	75 (2)		
No. 100						15 (2)	30 (2)	
No. 200			2-12	2-12	5-15	8 (2)	15 (2)	15 (2)

**Notes:**

1. Reference: Wisconsin Department of Transportation *Standard Specifications for Highway and Structure Construction*.
2. Percentage applies to the material passing the No. 4 sieve, not the entire sample.
3. Per WisDOT specifications, both breaker run and select crushed material can include concrete that is 'substantially free of steel, building materials and other deleterious material'.

**Table 2**  
**Compaction Guidelines**

Area	Percent Compaction (1)	
	Clay/Silt	Sand/Gravel
<b><u>Within 10 ft of building lines</u></b>		
Footing bearing soils	93 - 95	95
Under floors, steps and walks		
- Lightly loaded floor slab	90	90
- Heavily loaded floor slab and thicker fill zones	92	95
<b><u>Beyond 10 ft of building lines</u></b>		
Under walks and pavements		
- Less than 2 ft below subgrade	92	95
- Greater than 2 ft below subgrade	90	90
Landscaping	85	90

**Notes:**

1. Based on Modified Proctor Dry Density (ASTM D 1557)

**APPENDIX E**

**SETTLEMENT PLATFORM**



## Settlement Platform Instructions

Settlement platforms will be placed as close to the bottom of the fill as is practical. The surface upon which the settlement platform should rest must be cleaned off to a flat compacted surface. The settlement platform should then be placed in this surface and backfill should be placed over the top of the settlement platform to a depth of at least two feet.

Initial elevations should be taken on the top of the first section of the pipe riser. These should be referenced to the elevation at the platform so that all future additional lengths of riser pipe can be referenced to the elevation of the platform.

The settlement platform locations should be guarded with tall stakes driven into the fill marked with red flags. No equipment should be permitted to operate closer than three feet from the riser pipes. As each layer of fill is being added to the area, fill should be carefully placed around the riser pipe to an elevation slightly above the surrounding area. The vibrating compactor then should be moved to within a foot or so of the riser pipe with care being taken so as to avoid disturbance of the riser pipe. If necessary, hand compacting equipment should be used to avoid damage to the riser pipe.

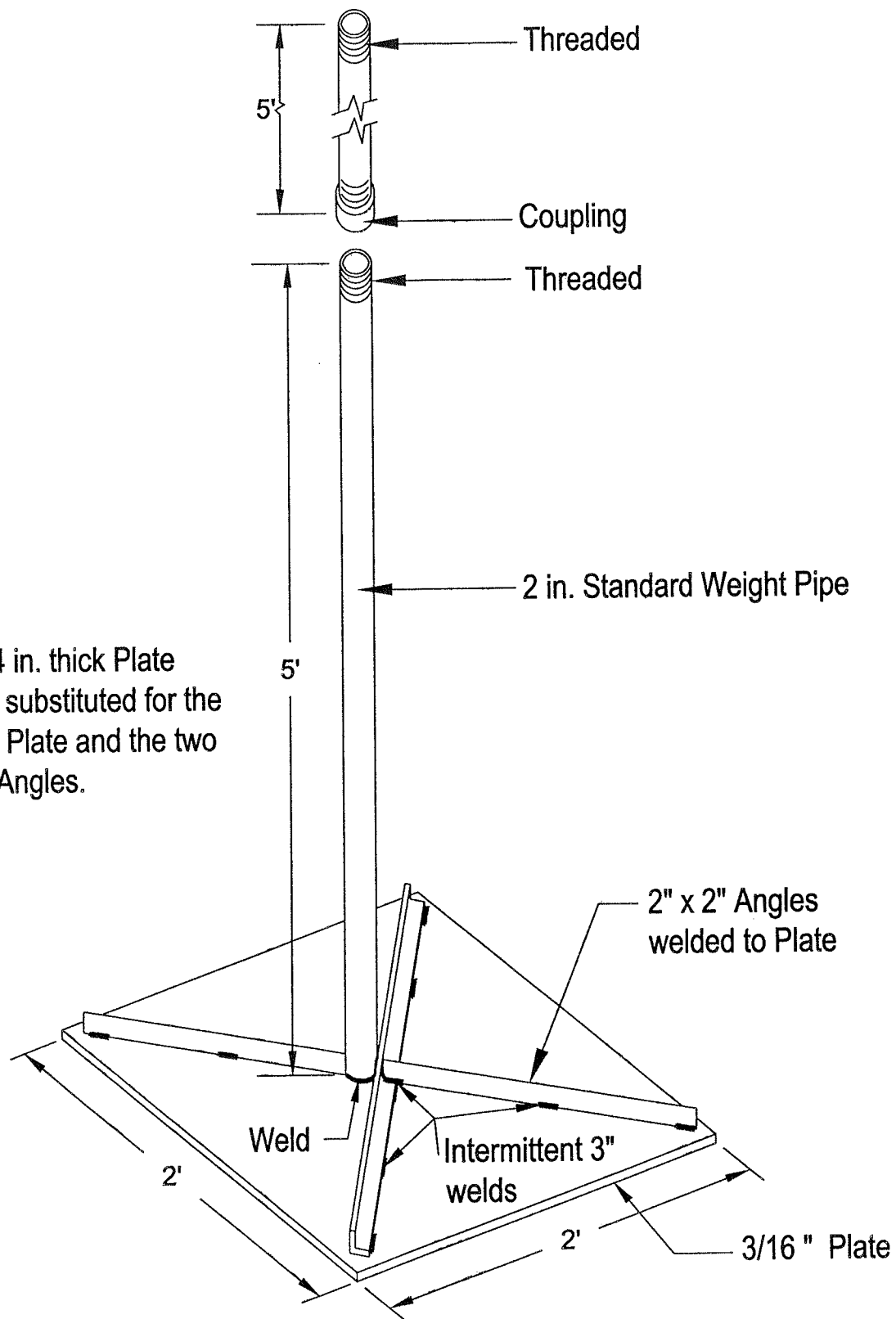
When settlement platform readings are taken, the elevation of nearby fill should also be taken.

The elevation at the settlement platform and the nearby fill should be observed at least once each week, and during the period that fill is being placed in the vicinity of the platform, these elevations should be obtained daily. All elevation data should be plotted according to time, with one graph prepared per settlement platform. The plotting should contain the time scale along the abscissa and the vertical scale should be height of fill shown going upward from the middle of the paper, and the settlement of the settlement platforms should be plotted downward from the middle of the paper. The time scale should include both the actual calendar date and also the number of days since the platform was installed.

The benchmark to be used in reading the various settlement platforms should be well away from the proposed excavation or filling areas.

If damage occurs to any settlement platform riser pipe, it is suggested that the pipe be repaired as quickly as possible and the readings continued. The adjustment of these readings can be made, considering that settlement rate during the period of damage was uniform.

One 3/4 in. thick Plate  
may be substituted for the  
3/16 in. Plate and the two  
2" x 2" Angles.



CGC, Inc.

Typical Detail  
Settlement Platform

**APPENDIX F**

**WISCONSIN DEPARTMENT OF SAFETY & PROFESSIONAL SERVICES**  
***SOIL AND SITE EVALUATION – STORM FORM***



Division of Industry Services

P.O. Box 2658

Madison, Wisconsin 53701

## Attachment 2:

## SOIL AND SITE EVALUATION - STORM

In accordance with SPS 382.365, 385, Wis. Adm. Code, and WDNR Standard 1002

Page 1 of 2

Attach a complete site plan on paper not less than 8 1/2 x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent of slope, scale or dimensions, north arrow, and BM referenced to nearest road  <b>Please print all information</b> Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04(1)(m)]	County	Rock
	Parcel I.D.	0113100501
	Reviewed by:	
		Date:

Property Owner	County of Rock			Property Location		
Property Owner's Mail Address			Govt. Lot	NW 1/4	NW 1/4	S 13 T 3 N R 12 E
51 South Main Street			Lot #	Block#	Subd. Name or CSM #	
City	State	Zip Code	Phone Number	<input checked="" type="checkbox"/> City <input type="checkbox"/> Village <input type="checkbox"/> Town		Nearest Road
Janesville	WI	53545		Janesville		3700 County Trunk F
Drainage area	<input type="checkbox"/> sq ft <input type="checkbox"/> acres		Hydraulic Application Test Method			Soil Moisture
Test site suitable for (check all that apply):			<input checked="" type="checkbox"/> Morphological Evaluation			Date of soil borings: _____
<input type="checkbox"/> Bioretention; <input type="checkbox"/> Subsurface Dispersal System;			<input type="checkbox"/> Double Ring Infiltrometer			USDA-NRCS WETS Value:
<input type="checkbox"/> Reuse; <input type="checkbox"/> Irrigation; <input type="checkbox"/> Other _____			<input type="checkbox"/> Other: (specify) _____			<input type="checkbox"/> Dry = 1; <input type="checkbox"/> Normal = 2; <input type="checkbox"/> Wet = 3.

SW-1	#OBS.	<input type="checkbox"/> Pit	<input checked="" type="checkbox"/> Boring	Ground surface elevation		882.0 ft.	Elevation of limiting factor		<867.0 ft.	
Horizon	Approx. Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines (P200)	Hydraulic App Rate Inches/Hr
1	0-12	Topsoil (not sampled)								
2	12-48	10YR 3/4	none	SCL	0m	mfi		<10		0.11
3	48-180	10YR 6/3	none	XGRSL	0sg	ml		62 <sup>(1)</sup>	11 <sup>(1)</sup>	1.63
Comments: Groundwater was not encountered during or upon the completion of drilling. <sup>(1)</sup> Based on Samples 2 and 3 (composite value).										

SW-2	#OBS.	<input type="checkbox"/> Pit	<input checked="" type="checkbox"/> Boring	Ground surface elevation		883.0 ft.	Elevation of limiting factor		<868.0 ft.	
Horizon	Approx. Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines (P200)	Hydraulic App Rate Inches/Hr
1	0-12	Topsoil (not sampled)								
2	12-48	10YR 5/3	none	SiL	2msbk	mfi		<5		0.13
3	48-72	10YR 7/2	none	XGRSL, SiL Seams	0sg	ml		70-80		0.13-0.50 <sup>(1)</sup>
4	72-180	10YR 6/3	none	XGRSL	0sg	ml		61 <sup>(2)</sup>	8 <sup>(2)</sup>	1.63
Comments: Groundwater was not encountered during or upon the completion of drilling. <sup>(1)</sup> Infiltration rate will be controlled by silt loam seams, but can likely be improved by excavating/turning over the granular deposit to break up the lower-permeability seams; samples should be collected during construction to check that the texture of the blended soil is consistent with the design infiltration rate. <sup>(2)</sup> Based on Samples 4 and 5 (composite value).										

Name (Please Print)	Tim F. Gassenheimer	Signature		Credential Number	SP-011900004
Address	129 Milky Way, Madison, WI 53718	Date Evaluation Conducted	September 9, 2021	Telephone Number	(608) 288-4100

SW-3	#OBS.	<input type="checkbox"/> Pit	<input checked="" type="checkbox"/> Boring	Ground surface elevation	880.0 ft.	Elevation of limiting factor	<865.0 ft.			
Horizon	Approx. Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines (P200)	Hydraulic App Rate Inches/Hr
1	0-12	Topsoil (not sampled)								
2	12-48	10YR 5/3	c1f 10YR 6/1	SiCL	0m	mvfi		<5		0.04
3	48-96	10YR 6/3	none	XGRSL, SiL Seams	0sg	ml		60-70		0.13-1.63 <sup>(1)</sup>
4	96-144	10YR 4/2	none	XGRSL, SiCL Sms	0sg	ml		60-70		0.13-0.50 <sup>(1)</sup>
5	144-180	10YR 6/3	none	XGRSL	0sg	ml		60-70		0.50
<u>Comments:</u> Groundwater was not encountered during or upon the completion of drilling; redox in Horizon 2 is assumed to result from periodically infiltrating surface water, that may become retained in the lower-permeability soils for prolonged periods of time. <sup>(1)</sup> Infiltration rate will be controlled by <i>silt loam/silty clay loam seams</i> , but can likely be improved by excavating/turning over the granular deposit to break up the lower-permeability seams; samples should be collected during construction to check that the texture of the blended soil is consistent with the design infiltration rate.										

SW-4	#OBS.	<input type="checkbox"/> Pit	<input checked="" type="checkbox"/> Boring	Ground surface elevation	883.5 ft.	Elevation of limiting factor	<868.5 ft.			
Horizon	Approx. Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines (P200)	Hydraulic App Rate Inches/Hr
1	0-12	Topsoil (not sampled)								
2	12-30	10YR 3/3	none	SCL (Fill)	0m	mvfi		5-15		0.11 <sup>(1)</sup>
3	30-96	10YR 6/3	none	XGRSL	0sg	ml		60 <sup>(2)</sup>	11 <sup>(2)</sup>	1.63
4	96-180	10YR 5/4	none	VGRS	0sg	ml		45 <sup>(3)</sup>	7 <sup>(3)</sup>	3.60
<u>Comments:</u> Groundwater was not encountered during or upon the completion of drilling. <sup>(1)</sup> Infiltration rate in <i>Fill</i> should be considered very approximate due to the potential for seams/layers of dissimilar material or variable composition. <sup>(2)</sup> Based on Sample 2. <sup>(3)</sup> Based on Sample 4.										

Overall Site Comments: See Comments above and Stormwater Infiltration Potential section in Geotechnical Exploration Report.

**THIS PAGE INTENTIONALLY BLANK**

**SECTION 00 41 00 BID FORM**

**ROCK COUNTY LES/JAIL  
Bid Package 1 – Footings & Foundations  
200 US-14, Janesville, Wisconsin 53545  
Rock County Project #2022-20**

\_\_\_\_\_, 2022  
(Date)

To: Shilo Titus, Purchasing Manager  
Rock County Courthouse, Purchasing Division  
51 South Main Street  
Janesville, WI 53545

From: \_\_\_\_\_  
(Name)  
\_\_\_\_\_  
(Address)  
\_\_\_\_\_  
(Email Address)  
\_\_\_\_\_  
(Phone Number)  
\_\_\_\_\_  
(Wisconsin Contractor Registration Number)

**(If addendum numbers are not filled in, it will be assumed that if an addendum was issued, it was not received and therefore the bid will be rejected as nonresponsive. If no addendum were issued please fill in NA in both blanks)**

Having carefully examined the Instructions to Bidders, General and Supplementary Conditions of the Contract, the Specifications, including Addenda Nos. \_\_\_\_\_ to \_\_\_\_\_ inclusive, (receipt of which is hereby acknowledged) and the Drawings and having visited the site and examined all conditions affecting the work, the Undersigned proposes to furnish all labor and materials called for by the said Documents for completion of the below identified Work Package for the Rock County LES/JAIL Project at 200 US-14 in Janesville Wisconsin for the sum constituting:

**WORK PACKAGE:**

Work Package #: \_\_\_\_\_

Work Package Name (i.e. Concrete): \_\_\_\_\_

**BASE BID:**

All labor and miscellaneous products, materials, equipment and allowances necessary to complete the Work Package identified above.

Total cost shall be:

\$ \_\_\_\_\_  
Written Words

\$ \_\_\_\_\_  
Numeric Amount

**SUBSTITUTE BIDS**

These Bids are to be used for consideration by the Owner for substitutes for materials, products, equipment and appliances specified, subject to requirements set forth in the Instructions to Bidders.

**Substitute Bid (A) - For Substituting:  
ADD or (DEDUCT)**

\$ \_\_\_\_\_  
Written Words

\$ \_\_\_\_\_  
Numeric Amount

Specified Manufacturer's Name: \_\_\_\_\_

Specified Product Name: \_\_\_\_\_

Substitute's Manufacturer's Name: \_\_\_\_\_

Substitute Product Name \_\_\_\_\_

**ALLOWANCES** NOTE: All General Allowance Prices shall be included in the Base Bid.

**Undercut Allowance (Specification Section 01 21 00 – Allowances)**

Include in Base Bid, an allowance for all labor, equipment, and materials (including trucking to and removal of spoils from the site) required for undercuts totaling 4,000 cubic yards. (Undercutting method and materials as described within specification section 31 05 00 – Common Work results for Earthwork - Outside Building Footprint and specification section 31 00 00 Earthwork for Building). Allowance shall be equal to the undercutting unit price provided times the quantity stated here. For approved quantities in excess of the Undercutting allowance, the Undercutting cost will be paid in accordance with the required Undercutting unit price. Any unused portion of the allowance shall be refunded to the owner as a credit at the end of the project.



**UNIT PRICES****Item No. 1**

Cost per Cubic Yard for Undercutting (as defined in 31 05 00 - Common Work Results for Earthwork (Outside Building Footprint) specifications, including removal and replacement, as well as all trucking to and removal of spoils from the site.

\$ \_\_\_\_\_  
Written Words

\$ \_\_\_\_\_  
Numeric Amount

**BIDDER'S QUALIFICATION STATEMENT AFFIDAVIT OF COMPLIANCE**

Contractor is required to fill out and submit the Bidder's Qualification Statement Affidavit of Compliance found in Specification Section 00 42 00 Affidavit of Compliance.

**PERFORMANCE AND PAYMENT BOND**

Per Section 00 61 00 Bonds, a bidding Contractor may be required to provide a performance and payment bond along with a Labor and Material Bond. Please confirm you are able to obtain referenced bonds for this project and indicate added cost to Base Bid to provide said bonds.

- ☐ Yes, bidder can provide referenced bonds and cost (to be added to Base Bid) to provide is

\$ \_\_\_\_\_ (Numeric Amount)

- ☐ No, bidder can not provide referenced bonds

**BID GUARANTEE**

Accompanying this Proposal is a (Certified Check) (Bid Bond) (Bank Draft) in the amount of not less than five percent (5%) of the total bid:

\$ \_\_\_\_\_  
Written Words

\$ \_\_\_\_\_  
Numeric Amount

payable to \_\_\_\_\_ of \_\_\_\_\_, WI. which will be forfeited if the Undersigned fails to enter into Contract for the Project.

Sworn and subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_, 2021

Notary Public \_\_\_\_\_

(Seal)

County \_\_\_\_\_

My Commission expires \_\_\_\_\_

**SUPPLEMENTAL INFORMATION**

In order for a bid to be complete a bidder is required to submit:

- Bid Form
- Bidder's Qualification Statement Affidavit of Compliance
- Bid Guarantee

**END OF DOCUMENT**

**REQUIRED  
BIDDER'S QUALIFICATION STATEMENT  
AFFIDAVIT OF COMPLIANCE**

**#2022-20  
INVITATION TO BID  
BP#1 ROCK COUNTY LES/JAIL  
REPLACEMENT  
FOR  
ROCK COUNTY FACILITIES MANAGEMENT**

**THIS FORM MUST BE COMPLETED AND SUBMITTED WITH BID TO BE CONSIDERED**

\_\_\_\_\_ ("Affiant"), as a potential contractor or subcontractor, on a project for the County of Rock, swears, under oath and penalty of perjury, as follows:

NAME OF FIRM	
FIRM CONTACT	
ADDRESS AND/OR PO BOX	
CITY-STATE-ZIP	
TELEPHONE NUMBER	
FAX NUMBER	
E-MAIL	
WHEN ORGANIZED	
WHERE INCORPORATED	

Has your firm ever defaulted on any contract or failed to complete any work awarded to you?	YES	NO
Have any of your contracts resulted in lawsuits?	YES	NO
Has your firm or any member thereof, while performing work of the nature to which is being bid, ever filed bankruptcy?	YES	NO
Does your firm possess all technical qualifications and resources, including equipment, personnel, and financial resources, necessary to perform the work required for this project?	YES	NO
Does your firm possess all valid, effective licenses, registrations or certificates required by federal, state, county or local law, but not limited to, those for any type of trade work or specialty work?	YES	NO
Does your firm maintain a substance abuse policy for employees?	YES	NO
Will all employees assigned to this work have been through a safety training program within the last year?	YES	NO
Has your firm committed a willful violation of federal, state, or local government safety laws determined by a final decision of a court or government agency authority?	YES	NO
All employees assigned to this work will have to pass a Rock County Law Enforcement Background Check. Will your firm pre-screen these employees before they are submitted for a County Law Enforcement Background Check?	YES	NO
Has your firm had any type of business contracting or trade license, certification or registration revoked or suspended?	YES	NO
Has your firm been debarred by any federal, state or local government agency?	YES	NO

**CURRENT CONTRACTS HELD:** List contracts your organization has in progress as of the date of this statement. If contract is as a sub, give the name of the prime contractor, amount of total contract and amount of sub contract.

To adequately describe the scope of work, please feel free to attach a separate sheet with relevant information.

CONTRACT AMOUNT	SCOPE OF WORK	COMPLETION DATE	OWNER PHONE #	ARCHITECT PHONE #

**LIST LAST FIVE CONTRACTS COMPLETED:**

CONTRACT AMOUNT	SCOPE OF WORK	COMPLETION DATE	OWNER PHONE #	ARCHITECT PHONE #

In order for a bidder to be considered for an award of Contract, the County shall be satisfied that the bidder meets the following requirements:

- **Has completed at least two (2) project of similar size and scope of work being bid.**
- Said project shall have been of the scope and type currently being bid as outlined in the Specifications of this Project Manual.

CONTRACT AMOUNT	SCOPE OF WORK	COMPLETION DATE	OWNER PHONE #	ARCHITECT PHONE #

To adequately describe the scope of work, please feel free to attach a separate sheet with relevant information.

Do you have any objection to our inquiring about any or all of the projects listed above? If yes, describe the circumstances: Yes ☐ No ☐

---



---



---

Will an on-site, skilled superintendent or foreman capable of executing the work under the Contract be assigned to this project? Yes ☐ No ☐

Will this skilled superintendent or foreman actually be entrusted with executing the work under the Contract? Yes ☐ No ☐

If no, please explain:

---



---

List the training and experience of the superintendent or foreman:

---



---



---

**EQUIPMENT:** List all major equipment to be used on this project.

DESCRIPTION	OWNED/LEASED	QTY	CONDITION

- Financing: Financial Statement must be provided upon request.
- List any additional information or references on company letterhead.

The person signing below has the authority to sign on behalf of, and bind, the Affiant.

Affiant understands that failing to submit the requited affidavit, or providing incorrect, false, or misleading information, shall automatically disqualify the Affiant from be awarded the public works contract and/or performing work on the project.

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**THIS PAGE INTENTIONALLY BLANK**



SECTION 00 50 00  
AGREEMENT FORMS

1.1 Form of Agreement

- A. Subcontract
  1. The standard the Construction Manager unmodified subcontract document will be used for all subcontract Agreements assigned to the Construction Manager, including any additional exhibits added at the discretion of the Construction Manager.
- C. Reference the following Agreement forms.
  1. The Standard the Construction Manager Subcontract Agreement form unmodified. Reference enclosed form.

1.2 Execution

- A. The Subcontract Agreement will be prepared in duplicate by the Construction Manager for signature by the Construction Manager and subcontractor or vendor.
  1. Two (2) original copies will be sent to the subcontractor or vendor for signature.
  2. The subcontractor or vendor will sign both contracts and forward both back to the Construction Manager.
  3. One (1) executed copy will be returned to the subcontractor or vendor and one (1) executed copy will be retained by the Construction Manager.

# **SUBCONTRACT AGREEMENT**



November 2, 2021

Name  
Company  
Address  
City, State Zip

RE: Job Name  
City, St

Dear Name:

**Please read this information and follow the instructions closely. Failure to do so will result in the return to you of improperly completed contracts, insurance certificates, invoices, etc.**

**CONTRACT**

Enclosed is a copy of our subcontract agreement.

Have the President of your company sign the agreement, scan, and return the signed copy to **Admin name (admin email)**.

**INSURANCE**

Enclosed is a sample insurance certificate to be completed and returned by your insurance carrier or agent. The amount of coverage must be met. Insurance certificates must include all additional insureds and state that all liability insurance afforded additional insureds is on a primary basis, as listed on the sample insurance certificate. **INSURANCE CERTIFICATES MUST BE ON FILE PRIOR TO ANY WORK AT THE JOB SITE. SEND COIs TO [insurancecerts@jpcullen.com](mailto:insurancecerts@jpcullen.com).**

**PAYMENT**

**Starting November 24, 2021 ALL Pay Apps should be sent to [payapps@jpcullen.com](mailto:payapps@jpcullen.com). The [invoices@jpcullen.com](mailto:invoices@jpcullen.com) email will no longer be monitored after 11/23/2021, please update your records to [payapps@jpcullen.com](mailto:payapps@jpcullen.com).**

Each invoice (draw) must be accompanied by a fully completed (all three pages) Application for Payment form (enclosed).

Each change order must be listed on page 3, individually, as issued.

All Applications for Payment must be in our Janesville office by the 23<sup>rd</sup> of each month.

**PLANS**

Advise this office if you require Architect/Engineer plans and specifications.

104 E. Pleasant Street | Milwaukee, Wisconsin 53212 | p: 414.988.0088 | f: 414.988.0089

**JPCULLEN.COM**

**JANESVILLE**  
**MADISON**  
**MILWAUKEE**

SAFETY DATA SHEETS (SDS)

The United States Occupational Safety and Health Administration (US OSHA) enacted the use of a Global Harmonization Standard (GHS) to aid in the labeling and identification of products in the Hazard Communication standard. It is a requirement of this contract that you furnish to J. P. Cullen & Sons, Inc. and any end user of this material a copy of any required SDS Sheets. Electronic copies are acceptable. If you, as a subcontractor, determine that a SDS Sheet is not required, a statement to that effect must be written on your letterhead and sent to this office.

JOB COORDINATION

Please advise us of the name of the person in your organization who will serve as the project manager responsible for this project.

Submit all above information electronically within 10 days of receiving.

Sincerely,

J. P. Cullen & Sons, Inc.

Project Manager Name, Project Manager

E-mail: PM Email

PM Initials/admin initials

Enc:





November 2, 2021

Name  
Company  
Address  
City, State Zip

PROJECT NAME: Name of Project

PROJECT MANAGER: Project Manager Name

PROJECT MANAGER PHONE NUMBER: PM Phone #

CORRESPONDENCE & SHOP DRAWINGS VIA EMAIL TO: Project Manager's Email

SHOP DRAWINGS & SAMPLES: Shop Dwgs Due Date

DELIVERY OR START DATE: Start Date

COMPLETION DATE: Completion Date

JOB PROGRESS MEETINGS: Will Advise

MATERIAL STORAGE: See Superintendent

PROJECT SUPERINTENDENT: Superintendent Name

PROJECT ADDRESS: Mailing: 104 East Pleasant Street, Milwaukee, WI 53212

Invoices: P.O. Box 5957, Janesville, WI 53547-5957

Shipping: Jobsite Address

PROJECT PHONE NUMBER: Supt. Phone #Superintendent Cell #

104 E. Pleasant Street | Milwaukee, Wisconsin 53212 | p: 414.988.0088 | f: 414.988.0089

JPCULLEN.COM

JANESVILLE  
MADISON  
MILWAUKEE

## SUBCONTRACT AGREEMENT

JPC Job #XXXX

This Agreement is effective as of this **day** of **Month**, 20XX by and between the Contractor and the Subcontractor:

**S#XXXX**

### Contracting Parties:

#### **Contractor**

J.P. Cullen & Sons, Inc.  
104 East Pleasant Street  
Milwaukee, WI 53212  
F.E.I.N. 39-1367756  
Phone: 414-988-0088  
FAX: 414-988-0089

#### **Subcontractor**

Company  
Address  
City, State Zip  
Phone: Phone Number  
Email: Email

**Project:** **Project Name**

**Owner:** **Owner Name**

**Architect/Engineer:** **Architect Name**

#### **Prime Contract:**

The Contractor and Owner have entered into a contract to construct the Project ("Prime Contract"). The Prime Contract is dated **Prime Contract Date** and described as follows:

**Insert Prime Contract Name and any relevant contract number**

#### **Subcontract:**

The Subcontract is comprised of the following documents: (a) the Subcontract Agreement and its exhibits; (b) the Subcontract General Conditions; and (c) the Prime Contract, excluding compensation and other confidential information, and including but not limited to its General, Supplementary, and other Conditions; the Drawings dated **Drawing Date** contained in Drawing Volumes **#s**; the Specifications dated **Spec Dates for the Specifications contained in the Project Manual dated Project Manual Date**; all addenda issued prior to execution of the Prime Contract (including the following: **Addendum Number with Dates**); and all modifications issued subsequent thereto. Each such document may be referred to as a Subcontract Document.

#### **Subcontract Work:**

Provide construction labor, materials, equipment, and services pursuant to this Subcontract for the completion of the work called for by the following:

#### **SCOPE**

Subcontractor acknowledges that the Prime Contract's Drawings and Specifications are incorporated in this Subcontract, and that Specification sections and Drawings that are not listed under Subcontract Work may pertain to the Subcontract Work.

**Schedule:**

Date for Shop Dwg./Samples: Shop Dwgs Due Date

Subcontractor shall perform and complete the Subcontract Work in compliance with the Schedule of Work for the Prime Contract, as such may be revised from time to time, and the schedule provisions of the Subcontract General Conditions, all in support of Contractor's performance and completion obligations to Owner.

**Subcontract Price:**

**(\$##,###.00) Dollar Amount Written and 00/100 Dollars** All state (Wisconsin), county, and local sales and use taxes are included in the Subcontract Price and are the responsibility of Subcontractor.

**Insurance Limits and  
Additional Insureds:**

The insurance coverages and limits required of the Subcontractor are set forth in the Subcontract General Conditions. The Additional Insureds to be named are specified on the sample Certificate of Insurance (Exhibit A) attached. Subcontractor must provide the duly issued Certificates of Insurance prior to commencement of the Subcontract Work, and Contractor will not pay Subcontractor without proper Certificates of Insurance on file.

**Other Terms and  
Conditions:**

1. TOBACCO FREE project.

---

The Subcontract includes the following exhibits to the Subcontract Agreement:

**Subcontract General Conditions (September 2014 edition)**  
**Exhibit A Sample Certificate of Insurance**

In witness whereof this Subcontract Agreement is entered into as of the date first written above.

**J.P. Cullen & Sons, Inc.**

**Company**

By: \_\_\_\_\_ \*

By: \_\_\_\_\_ \*

Printed Name: Shannon Metoxen

Printed Name: \_\_\_\_\_

Title: Division Manager – Milwaukee Division\*

Title: \_\_\_\_\_ \*

F.E.I.N.: \_\_\_\_\_  
(Federal Employer Identification Number)

\_\_\_\_\_  
Contractor License Number

- ☐ Wisconsin  
☐ Illinois

\* Each person signing this agreement for either party warrants that (s)he is duly authorized to do so and all consents have been obtained to make this Subcontract Agreement legally binding.

## AUTHORIZED REPRESENTATIVES

The Contractor hereby designates one or more persons who shall be the Contractor's authorized representative(s) on-site and off-site. Such authorized representative(s) shall be the only person(s) the Subcontractor shall look to for instructions, orders, and/or directions, except in an emergency. Contractor may supplement or modify the designation of authorized representative(s) in writing, at any time.

### Contractor's Authorized Representative (s)

Name: Name

Title: Title

Phone Number: Phone Number

E-Mail Address: Email Address

The Subcontractor hereby designates one or more persons who shall be the Subcontractor's authorized representative(s) on-site and off-site. Such authorized representative(s) shall be the only person(s) to whom the Contractor shall issue instructions, orders, or directions, except in emergency. Contractor may supplement or modify the designation of authorized representative(s) in writing, at any time.

### Subcontractor's Authorized Representative(s)

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Phone Number: \_\_\_\_\_

E-Mail Address: \_\_\_\_\_



## SUBCONTRACT GENERAL CONDITIONS

### TABLE OF ARTICLES

1. GENERAL PROVISIONS
2. CONTRACTOR'S OBLIGATIONS
3. PERFORMANCE OF THE SUBCONTRACT WORK
4. SCHEDULE AND DELAYS
5. TESTING, WARRANTY, AND CORRECTION OF SUBCONTRACT WORK
6. SAFETY OF PERSONS AND PROPERTY
7. LABOR RELATIONS
8. SURETY BONDING
9. INSURANCE
10. INDEMNIFICATION
11. CHANGES
12. PAYMENT
13. CLAIMS
14. DISPUTE RESOLUTION
15. TERMINATION AND SUSPENSION; BANKRUPTCY

### ARTICLE 1 GENERAL PROVISIONS

**1.1 MUTUAL AGREEMENT.** The Contractor and the Subcontractor hereby mutually agree to be bound by the terms and conditions contained in the Subcontract.

**1.2 ENTIRE AGREEMENT.** This Subcontract represents the entire and integrated agreement between Contractor and Subcontractor with respect to the Project, and, unless specifically referenced herein, supersedes all prior written and oral agreements, negotiations, price quotes, representations, bids, proposals, and bid or proposal exceptions, conditions, and qualifications.

**1.3 FLOWDOWN OF PRIME CONTRACT RIGHTS AND OBLIGATIONS.** The Subcontractor shall assume toward the Contractor all duties, obligations, and responsibilities which the Contractor, under the Prime Contract, assumes toward the Owner, to the extent of the Subcontract Work. The Contractor shall have the benefit of all rights, remedies, and redress against the Subcontractor that the Owner, under the Prime Contract, has against the Contractor. Subcontractor's sub-subcontractors and suppliers shall be similarly bound by the terms of the Subcontract to the extent of the work to be performed.

**1.4 NO THIRD PARTY BENEFICIARIES.** Nothing in the Subcontract shall be construed to create a contractual relationship between persons or entities other than the Contractor and Subcontractor.

**1.5 INDEPENDENT CONTRACTORS.** Contractor and Subcontractor are independent contractors and not joint-venturers, agents, representatives, or partners of each other.

**1.6 BUSINESS AND PROFESSIONAL LICENSES.** Subcontractor represents and warrants that it has obtained

all necessary licenses to perform its obligations under the Subcontract.

**1.7 PERMITS, FEES, AND LICENSES.** The Subcontractor shall give adequate notices to authorities pertaining to the Subcontract Work and secure and pay for all permits, fees, licenses, assessments, inspections, and taxes necessary to complete the Subcontract Work in accordance with the Subcontract.

**1.8 NO UNAUTHORIZED DELEGATION OR SUBCONTRACTING OF DUTIES.** The Subcontractor is prohibited from delegating, transferring, assigning, conveying, subcontracting, relinquishing, or otherwise disposing of the whole or a substantial part of its duties under this Subcontract without the prior written approval of the Contractor.

**1.9 ASSIGNMENT BY CONSENT ONLY.** Subcontractor shall not assign any rights under this Subcontract, including the right to any payment due or which may become due Subcontractor, without the express written consent of Contractor. Any assignment made without Contractor's written consent shall be void.

**1.10 COMPLIANCE WITH LAWS.** The Subcontractor agrees to be bound by, and at its own cost, comply with all federal, state, and local laws, ordinances, and regulations (hereinafter collectively referred to as "laws") applicable to the Subcontract Work including, but not limited to, equal employment opportunity, minority business enterprise, women's business enterprise, disadvantaged business enterprise, and all other laws with which the Subcontractor must comply according to the Subcontract. The Subcontractor shall be liable to the Contractor and the Owner for all loss, cost, and expense attributable to any acts of commission or omission by the Subcontractor, its employees, and agents resulting from the failure to comply therewith, including, but not limited to, any fines, penalties, or corrective measures, except as provided in Paragraph 6.2.2.

**1.11 CONTROLLING LAW.** This Subcontract shall be governed by the laws of the State of Wisconsin, unless the project is not located in Wisconsin and the state where the project is located requires by statute that its state law applies to the Subcontract.

**1.12 SUBCONTRACT GOVERNS.** Where a provision of the Prime Contract is inconsistent with a provision of the Subcontract Agreement or Subcontract General Conditions, the provision of the Subcontract Agreement or Subcontract General Conditions shall govern.

**1.13 PRIORITY OF SUBCONTRACT AGREEMENT.** In the case of a conflict between the express provisions of the

Subcontract Agreement and any other provision of the Subcontract, the provisions of the Subcontract Agreement shall govern.

**1.14 SEVERABILITY.** The partial or complete invalidity of any one or more provisions of this Subcontract shall not affect the validity or continuing force and effect of any other provision.

**1.15 WAIVER.** The failure of either party hereto to insist, in any one or more instances, upon the performance of any of the terms, covenants, or conditions of this Subcontract, or to exercise any right herein, shall not be construed as a waiver of relinquishment of such term, covenant, condition, or right as respects further performance.

**1.16 REQUIREMENT OF SIGNATURES.** Whenever there is a requirement for written authorization, such authorization must be signed by an authorized representative of Contractor and Subcontractor to be effective. Such signature is effective if it is transmitted to the other party by electronic facsimile or in portable document format (PDF).

**1.17 COPIES OF SUBCONTRACT.** The Contractor has furnished the Subcontractor with one (1) copy of the Subcontract Agreement and Subcontract General Conditions; one (1) copy of all other Subcontract Documents is available upon request. Additional copies will be furnished to the Subcontractor upon request at cost, or in electronic/digital format. The Subcontractor may make copies of applicable portions of the Subcontract available to its proposed subcontractors and suppliers.

**1.18 DEFINED TERMS.** Terms shall be defined as set forth in these Subcontract General Terms and Conditions and in the Subcontract Agreement; such defined terms shall be indicated with initial capital letters.

**1.19 TITLES.** The titles given to Articles and Paragraphs herein are for ease of reference only and shall not be relied upon or cited for any other purpose.

## **ARTICLE 2 CONTRACTOR'S OBLIGATIONS**

**2.1 PAYMENT.** As full compensation for satisfactory performance of the Subcontract, Contractor agrees to pay Subcontractor the Subcontract Price, subject to all applicable provisions of the Subcontract.

**2.2 TIMELY COMMUNICATIONS.** The Contractor, with reasonable promptness, shall transmit to the appropriate parties all submittals, transmittals, and written approvals relating to the Subcontract Work. Unless otherwise specified in the Subcontract or as necessary to protect safety or property, communications by and with the Subcontractor's subcontractors, material men, and suppliers shall be through the Subcontractor.

**2.3 LAYOUT RESPONSIBILITY AND LEVELS.** The Contractor shall establish principal axis lines of the building and site.

## **ARTICLE 3 PERFORMANCE OF THE SUBCONTRACT WORK**

**3.1 SUBCONTRACT WORK.** The Subcontractor shall, to the satisfaction of the Contractor and Owner, furnish all of the labor, materials, equipment, and services, including, but not limited to, competent supervision, shop drawings, samples, tools, and scaffolding as are necessary for or incidental to the proper performance of the work required by or reasonably inferable from this Subcontract. The Subcontractor shall provide to the Contractor a list of its proposed subcontractors and suppliers if requested, and be responsible for taking field dimensions, providing tests, ordering of materials, and all other actions as required to perform the Subcontract Work and to comply with the Schedule of Work.

**3.2 SITE VISITS.** The Subcontractor represents and acknowledges that it visited the Project site prior to formation of this Subcontract and visually inspected the general and local conditions that could affect the performance of the Subcontract Work. Any failure of the Subcontractor to reasonably ascertain from a visual inspection of the site the general and local conditions that could affect the Subcontract Work shall not relieve the Subcontractor from its responsibility to properly complete the Subcontract Work without additional expense to the Contractor.

**3.3 SUBCONTRACT WORK AT THE SITE.** A preliminary conference, to be scheduled by the Contractor, is required before beginning work at the job site. Attendance by the Subcontractor's project manager and job site foreman is mandatory.

**3.4 REPORTING DISCREPANCIES.** If, before or during the performance of the Subcontract Work, Subcontractor discovers any conflict, error, ambiguity, or discrepancy within the Subcontract (including but not limited to the Drawings and Specifications), or between the Subcontract and (a) any applicable law or regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any supplier, then Subcontractor shall promptly report it to Contractor in writing. Subcontractor shall not proceed with the Subcontract Work affected thereby (except in an emergency) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation furnished by Contractor, or by an amendment or supplement to the Subcontract. If the Subcontractor performs Subcontract Work knowing that a conflict, error, ambiguity, or discrepancy has not yet been resolved, then the Subcontractor shall assume full responsibility for such Subcontract Work and shall bear

all associated costs, charges, fees, damages, and expenses.

**3.5 ACCURACY OF SUBCONTRACT WORK.** After Contractor has established principal axis lines of the building and site, the Subcontractor shall lay out and be responsible for the accuracy of the Subcontract Work and for any loss or damage to the Contractor or others by reason of the Subcontractor's failure to set out or perform its Subcontract Work correctly. The Subcontractor shall exercise prudence so that the actual final conditions and details of its Subcontract Work shall result in alignment of finish surfaces.

**3.6 PERFORMANCE OF SUBCONTRACT WORK.** The Subcontractor shall use its best care, skill, and diligence in supervising, directing, and performing the Subcontract Work. The Subcontractor shall have responsibility and control over the performance of the Subcontract Work, including the construction methods, techniques, means, and sequences for coordinating and completing the various portions of the Subcontract Work, unless the Subcontract gives other specific instructions concerning these matters.

**3.7 MATERIALS FURNISHED BY OTHERS.** In the event the scope of the Subcontract Work includes installation of materials or equipment furnished by others, it shall be the responsibility of the Subcontractor to examine the items so provided and thereupon handle, store, and install the items, unless otherwise provided in the Subcontract, with such skill and care as to ensure a satisfactory and proper installation. Loss or damage due to acts of the Subcontractor shall be deducted from any amounts due or to become due the Subcontractor under this Subcontract.

**3.8 USE OF CONTRACTOR'S EQUIPMENT.** The Subcontractor, its agents, employees, subcontractors or suppliers may use the Contractor's equipment only with the express written permission of the Contractor's designated representative and in accordance with Contractor's terms and conditions for such use.

**3.9 STORAGE.** At the sole discretion of the Contractor's authorized representative, Subcontractor may be allowed to store materials on-site, at a location expressly designated by Contractor, if space is available. Contractor may at any time require that Subcontractor relocate or remove such stored materials.

**3.10 TEMPORARY SERVICES.** The Contractor will provide to the Subcontractor at the Project site those temporary services expressly identified in the Subcontract as Contractor-provided. Unless otherwise indicated such temporary services are provided at Contractor's expense. The Subcontractor shall provide, at its own expense, all other necessary temporary services for the completion of the Subcontract Work.

**3.11 CLEANUP.** The Subcontractor shall follow the Contractor's cleanup directions, and

- (a) at all times keep the building and premises free from debris resulting from the Subcontract Work; and
- (b) broom clean each work area prior to discontinuing work in each area.

If the Subcontractor fails to immediately commence compliance with cleanup duties within twenty-four (24) hours after written notification from the Contractor of noncompliance, the Contractor may implement appropriate cleanup measures without further notice and deduct the cost thereof from any amounts due or to become due the Subcontractor under this Subcontract. Unless expressly stated otherwise, Subcontractor shall furnish its own dumpsters.

### **3.12 COORDINATION AND COOPERATION**

The Subcontractor shall:

- (a) cooperate with the Contractor and all others whose work may interface with the Subcontract Work;
- (b) specifically note and immediately advise the Contractor of any interference with the Subcontract Work;
- (c) participate in the preparation of coordination drawings and work schedules involving the Subcontract Work; and
- (d) attend daily end-of-shift meetings as scheduled by Contractor's superintendent.

**3.13 COMMUNICATIONS.** Unless otherwise provided in the Subcontract, Subcontractor's communications by and with the Owner, Architect, separate contractors, and/or other subcontractors and suppliers of Contractor, regardless of tier, shall be through the Contractor.

**3.14 PATENTS.** Except as otherwise provided by the Subcontract, the Subcontractor shall pay all royalties and license fees that may be due on the inclusion of any patented materials in the Subcontract Work. The Subcontractor shall defend all suits brought against Contractor or Owner for infringement of any patent rights if such infringement arises out of the Subcontract Work, and Subcontractor shall be liable to the Contractor and Owner for all associated losses, including all costs, expenses, and attorneys' fees; but Subcontractor shall not be responsible for such defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Subcontract. However, if the Subcontractor has reason to believe that a particular

design, process, or product required by the Subcontract is an infringement of a patent, then the Subcontractor shall promptly furnish such information to the Contractor or be responsible to the Contractor and Owner for any loss sustained as a result thereof.

### **3.15 SHOP DRAWINGS, SAMPLES, PRODUCT DATA, AND MANUFACTURERS' LITERATURE**

**3.15.1** The Subcontractor promptly shall submit for approval to the Contractor, by the date(s) specified in the Subcontract Agreement or Schedule of Work, all shop drawings, samples, product data, manufacturers' literature, and similar submittals required by the Subcontract. If no specific date has been established, Subcontractor shall submit all such shop drawings and similar items within 30 days of the effective date of the Subcontract, and in such time and sequence so as not to delay the Contractor or others in the performance of the Prime Contract work.

**3.15.2** The Subcontractor shall be responsible to the Contractor for the accuracy and conformity of its submittals to the Subcontract's specific submittal requirements.

**3.15.3** In the event that the Subcontract does not contain submittal requirements pertaining to the Subcontract Work, the Subcontractor agrees upon Contractor's request to submit in a timely fashion to the Contractor for approval any shop drawings, samples, product data, manufacturers' literature or similar submittals as may reasonably be required by the Contractor, Owner, or Owner's architect or engineer, without any additional compensation to the Subcontractor.

**3.15.4** The approval of any Subcontractor submittal shall not be deemed to authorize deviations, substitutions, or changes in the requirements of the Subcontract unless express written approval is obtained from the Contractor authorizing such deviation, substitution, or change.

**3.16 PROFESSIONAL CERTIFICATIONS.** The Contractor, Owner, and Owner's architect or engineer are entitled to rely on the accuracy and completeness of any professional certifications required by the Subcontract, or contained in any submittal, concerning the performance criteria of systems, equipment, or materials, including all calculations relating thereto and any governing performance requirements.

### **3.17 DESIGN DELEGATION**

**3.17.1** If the Subcontract specifically requires the Subcontractor to (1) provide design services, and (2) specify all design and performance criteria, the Subcontractor shall provide those design services necessary to satisfactorily complete the Subcontract Work. Design services provided by the Subcontractor

shall be procured from licensed design professionals retained by the Subcontractor as permitted by the law of the place where the Project is located ("the Designer"). The Designer's signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by the Designer. Shop Drawings and other submittals related to the Subcontract Work designed or certified by the Designer, if prepared by others, shall bear the Subcontractor's and the Designer's written approvals when submitted to the Contractor. The Contractor shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by the Designer.

**3.17.2** If the Designer is an independent professional, the design services shall be procured pursuant to a separate agreement between the Subcontractor and the Designer, consistent with the terms of the Subcontract. The Subcontractor shall notify the Contractor in writing if it intends to terminate or replace any Designer. The Subcontractor shall be responsible for conformance of its design with the information given and the design concept expressed in the Subcontract. The Subcontractor shall not be responsible for the adequacy of the performance criteria or design criteria provided to Subcontractor in the Subcontract.

**3.18 PUNCH LIST.** The Contractor will schedule a punch list conference at or about the time of substantial completion of the Subcontract Work, or at Contractor's option at the time of substantial completion of the Prime Contract. Attendance by the Subcontractor's project manager and job site foreman is mandatory. Subcontractor shall proceed to complete all punch list tasks identified by Contractor, Owner, and Owner's architect or engineer, with regard to the Subcontract Work, within ten (10) working days of the conference.

## **ARTICLE 4 SCHEDULE AND DELAYS**

### **4.1 COMMENCEMENT OF SUBCONTRACT WORK.**

The Subcontractor shall commence the performance of the Subcontract Work at the site as of the date established in the Schedule of Work, as revised from time to time, or as authorized by Contractor. Subcontractor may begin necessary off-site preparatory work at any time after the effective date of the Subcontract.

**4.2 SCHEDULE OF WORK.** In a timely fashion, the Contractor shall provide the Subcontractor with the schedule proposed by the Contractor for the Subcontract Work. This schedule shall be incorporated as part of the schedule for performance of the Prime Contract ("Schedule of Work"). In consultation with the Subcontractor, the Contractor shall periodically review the Schedule of Work and shall revise and update such schedule (including the portion pertaining to the Subcontract Work), as necessary, as the work under the



Prime Contract progresses. The Schedule of Work and all subsequent changes and additional details thereto shall be submitted to the Subcontractor promptly and reasonably in advance of the required performance of the Subcontract Work. The Contractor shall have the right to determine and, if necessary, change the time, order, and priority in which the various portions of the Subcontract Work shall be performed in the Schedule of Work and all other matters relative to the timely and orderly conduct of the Subcontract Work. Subcontractor acknowledges that changes may be made in the Schedule of Work and agrees to comply with such changes without additional compensation. Contractor shall document all changes to the Schedule of Work in writing.

**4.3 SUBCONTRACT TIME.** The Subcontract Work shall be completed in accordance with the Schedule of Work ("Subcontract Time"). If the Subcontractor's progress or performance of the Subcontract Work or the procedures employed in completing the Subcontract Work is such that, in the Contractor's opinion, the Subcontract Work will not be completed within the required time, Subcontractor shall at its own expense work overtime, additional shifts, Saturdays and/or Sundays and/or holidays (if allowed by the Prime Contract), or hire additional employees, or revise its procedures as may be necessary to meet the Schedule of Work. If Subcontractor fails to take measures to meet the schedule, Contractor may invoke the measures in Article 15.

**4.4 TIME IS OF THE ESSENCE.** TIME IS OF THE ESSENCE WITH RESPECT TO SUBCONTRACTOR'S PERFORMANCE OF ITS OBLIGATIONS, and Subcontractor agrees to see to the performance of its respective Subcontract Work and the work of its subcontractors and suppliers so that the entire Project may be completed in accordance with the Prime Contract and the Schedule of Work. If Subcontractor shall fail to complete or diligently proceed with the Subcontract Work according to the Subcontract or Schedule of Work, Contractor may take over the Subcontract Work and complete or re-let the same to another subcontractor and deduct from the cost thereof from any amounts due or to become due the Subcontractor under this Subcontract Agreement. Subcontractor shall remain liable for damages, both liquidated and unliquidated, caused to Contractor or Owner by such failure or any other delays.

#### **4.5 DELAY**

**4.5.1** If Contractor, or a subcontractor of Contractor other than Subcontractor, delays, disrupts, or interferes with the performance or progress of the Subcontract Work, then Subcontractor shall be entitled to an equitable adjustment in the Subcontract Time. Revision of the Schedule of Work, as allowed by Paragraph 4.2, does not constitute delay, disruption, or interference by Contractor.

**4.5.2** Subcontractor shall not be entitled to an adjustment in Subcontract Price or Subcontract Time for delay, disruption, or interference caused by or within the control of Subcontractor. Delay, disruption, and interference attributable to and within the control of a sub-subcontractor or supplier of Subcontractor shall be deemed to be within the control of Subcontractor.

**4.5.3** If Owner, Owner's architect or engineer, or a contractor of Owner other than Contractor, delays, disrupts, or interferes with the performance or progress of the Subcontract Work, then Subcontractor shall be entitled to an equitable adjustment in Subcontract Time. In such a case Subcontractor also shall be entitled to an equitable adjustment of Subcontract Price if Contractor is entitled to and does in fact obtain such an adjustment, expressly attributable to the Subcontract Work, from Owner.

**4.5.4** If Subcontractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Subcontractor, its sub-subcontractors and suppliers, Owner, Owner's architect or engineer, a contractor of Owner other than Contractor, Contractor, or a subcontractor of Contractor other than Subcontractor, then Subcontractor shall be entitled to an equitable adjustment in Subcontract Time. Such an adjustment shall be Subcontractor's sole and exclusive remedy under this Subcontract for the delays, disruption, and interference described in this paragraph.

**4.5.5** Subcontractor shall not be entitled to an adjustment in Subcontract Price or Subcontract Time for any delay, disruption, or interference if such is concurrent with a delay, disruption, or interference caused by or within the control of Subcontractor.

**4.5.6** Any Subcontractor entitlement to an adjustment of the Subcontract Time under this article is conditioned on such adjustment being essential to Subcontractor's ability to complete the Subcontract Work within the Subcontract Time.

**4.5.7** Subcontractor is not entitled to damages or additional compensation based on delay, hindrance of work, impacts on progress, season changes, disruption, loss of productivity or efficiency, or schedule changes, except as expressly allowed under this Section 4.5.

**4.5.8** If Subcontractor delays, disrupts, or interferes with the performance or progress of Contractor's work, or the work of Owner or other contractors or subcontractors at the Site, then Contractor shall be entitled to recover from Subcontractor all associated costs, charges, fees, damages, and expenses (if any).

**4.6 LIQUIDATED DAMAGES.** If the Prime Contract provides for liquidated or other damages for delay beyond the completion date set forth in the Prime Contract, and such damages are assessed by the

Owner against the Contractor, then the Contractor may assess such damages against the Subcontractor in proportion to its share of the responsibility for such delay and damage, but no more. The amount of such assessment against the Subcontractor, if any, shall not exceed the Subcontractor's proportionate share of the responsibility for such delay and damage and shall never exceed the amount assessed against the Contractor by the Owner. Nothing in this paragraph shall limit the Contractor's right to recover all actual damages sustained by the Contractor as a result of the Subcontractor delay.

## **ARTICLE 5 TESTING, WARRANTY, AND CORRECTION OF SUBCONTRACT WORK**

**5.1 TESTS AND INSPECTIONS.** The Subcontractor shall schedule all required tests, approvals, and inspections of the Subcontract Work or portions thereof at appropriate times so as not to delay the progress of the Subcontract Work. The Subcontractor shall give proper written notice to all required parties of such tests, approvals, and inspections. The Subcontractor shall bear all expenses associated with tests, inspections, and approvals required of the Subcontractor by the Subcontract which, unless otherwise agreed to, shall be documented by an independent testing laboratory or entity approved by the Contractor and Owner. Required certificates of testing, approval or inspection shall, unless otherwise required by the Subcontract, be secured by the Subcontractor and promptly delivered to the Contractor.

### **5.2 UNCOVERING OF WORK**

**5.2.1** If required by the Contractor, the Subcontractor must uncover any portion of the Subcontract Work which has been covered by the Subcontractor in violation of the Subcontract or contrary to a directive issued to the Subcontractor by the Contractor. The Subcontractor shall promptly uncover such work for the Contractor's or Owner's inspection and then restore the uncovered work to its original condition at the Subcontractor's time and expense.

**5.2.2** The Contractor may direct the Subcontractor to uncover portions of the Subcontract Work for inspection by the Owner or Contractor at any time. The Subcontractor is required to uncover such work whether or not the Contractor or Owner had requested to inspect the work prior to it being covered. Except as provided in Paragraph 5.2.1, the Subcontract shall be adjusted by change order for the cost and time of uncovering and restoring any Subcontract Work which is uncovered for inspection and proved to have been installed in accordance with the Subcontract, provided the Contractor had not previously instructed the Subcontractor to leave the Subcontract Work uncovered. If the Subcontractor uncovers Subcontract Work pursuant to a directive issued by the Contractor,

and such Subcontract Work upon inspection is found not to comply with the Subcontract, then the Subcontractor shall be responsible for all costs and time of uncovering, correcting, and restoring the Subcontract Work so as to make it conform to the Subcontract. If the Contractor or some other entity for which the Subcontractor is not responsible caused the nonconforming condition, the Contractor shall adjust the Subcontract by change order for all such costs and time. Any reference to a change in Subcontract Time under this paragraph is subject to the provisions of Paragraph 4.5 above, concerning delays.

**5.3 WORKMANSHIP AND MATERIALS.** Every part of the Subcontract Work shall be executed in accordance with the Subcontract in a workmanlike and substantial manner. All materials used in the Subcontract Work shall be furnished in sufficient quantities to facilitate the proper and expeditious execution of the Subcontract Work. All materials and equipment shall be new except such materials and equipment as the Subcontract expressly allows or requires to be otherwise.

**5.4 NO SUBSTITUTIONS.** No substitutions shall be made in materials or equipment unless permitted in the Subcontract, and only then upon the Subcontractor first receiving all approvals required under the Subcontract for substitutions and written approval from Contractor.

**5.5 GENERAL WARRANTY.** Subcontractor warrants and guarantees to Contractor that all Subcontract Work will be in accordance with the requirements of the Subcontract and will not be deficient or defective. Subcontractor's warranty and guarantee hereunder excludes defects or damage caused by abuse, modification, or improper maintenance or operation by persons other than Subcontractor and its sub-subcontractors, suppliers, or any other individual or entity for whom Subcontractor is responsible; or normal wear and tear under normal usage. Subcontractor's obligation to perform and complete the Subcontract Work in accordance with the requirements of the Subcontract shall be absolute, and Subcontractor shall be fully responsible for the Subcontract Work under the Subcontract to at least the same extent that Contractor is responsible for the Subcontract Work to the Owner under the Prime Contract. This general warranty is in addition to all other warranties provided or required by law, contract, or otherwise.

**5.6 SPECIAL WARRANTIES.** The Subcontractor agrees to furnish any special warranties that are required by the Subcontract. Subcontractor shall submit such special warranties to Contractor no later than with Subcontractor's final payment application, or the start of the special warranty period if earlier than the submittal of the final payment application.

### **5.7 CORRECTION DUTY**

**5.7.1** While the Subcontract Work is in progress, Subcontractor shall correct the Subcontract Work to the same extent that Contractor is required to correct its work (including the Subcontract Work) under the Prime Contract. Subcontractor shall correct Subcontract Work whether or not installed or completed. If the Subcontract Work has been rejected, Subcontractor shall remove such rejected Subcontract Work from the Project at the direction of Contractor, and replace it with Subcontract Work that is not defective.

**5.7.2** For a period of one (1) year after final completion of the Subcontract Work, or no less than any period required under the Prime Contract relative to the Subcontract Work (whichever is longer), and promptly after receipt of written notice from Contractor, the Subcontractor shall correct all defective Subcontract Work as directed by Contractor. Subcontractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to any such correction or removal (including but not limited to all costs of repair or replacement of work of others).

**5.8 WARRANTY AND CORRECTION REMEDIES ARE NOT EXCLUSIVE.** Warranty and correction duties and obligations imposed by the Subcontract, 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 or contract.

## **ARTICLE 6 SAFETY**

### **6.1 SAFETY OF PERSONS AND PROPERTY**

**6.1.1** The Subcontractor is required to perform the Subcontract Work in a safe and reasonable manner. The Subcontractor shall seek to avoid injury, loss, or damage to persons or property by taking reasonable steps to protect:

- (a) employees and other persons at the site;
- (b) materials and equipment stored at the site or at off-site locations for use in performance of the Prime Contract or Subcontract Work; and
- (c) all property and structures located at the site and adjacent to work areas, whether or not said property or structures are part of the Project or involved in the Prime Contract or Subcontract Work.

**6.1.2** The Subcontractor shall give all required notices and comply with all applicable rules, laws, regulations, orders, and other lawful requirements established to prevent injury, loss, or damage to persons or property.

**6.1.3** The Subcontractor shall implement appropriate safety measures pertaining to the Subcontract Work and the Project, including establishing safety rules, posting appropriate warnings and notices, erecting safety barriers, and establishing proper notice procedures to protect persons and property at the site and adjacent thereto from injury, loss, or damage.

**6.1.4** Prevention of accidents in the performance of the Subcontract Work by the Subcontractor, its employees, persons, or entities performing work on behalf of the Subcontractor, is the responsibility of the Subcontractor. The Subcontractor shall establish its own safety program implementing safety measures, policies, and standards in accordance with industry practices and the requirements of governmental and quasi-governmental authorities having jurisdiction. The Subcontractor shall comply with Owner's safety requirements (if any) imposed by the Subcontract. If Contractor observes any unsafe practices Contractor may stop any part of the Subcontract Work that Contractor deems unsafe until Subcontractor takes corrective measures. The Contractor's failure to observe or stop Subcontractor's unsafe practices shall not relieve Subcontractor of the responsibility for such practices.

**6.1.5** The Subcontractor shall exercise extreme care in carrying out any Subcontract Work that involves explosives or other dangerous methods of construction or hazardous procedures, materials, or equipment.

**6.1.6** At all times relevant hereto, the Subcontractor shall use properly trained and qualified individuals or entities to carry out the Subcontract Work in a safe and reasonable manner so as to reduce the risk of personal injury or property damage.

**6.1.7** Subcontractor shall provide its workers with hard hats, safety glasses, and high visibility clothing, which shall be worn at all times. Subcontractor shall also furnish its workers any other personal protective clothing or other safety items required by the Subcontract or industry standards. If a Subcontractor worker is at the site without a required personal safety item, the worker must immediately leave the site. In some cases Contractor may have required items available for purchase by Subcontractor: Contractor-provided hard hats are \$25.00 each; safety glasses \$10.00 each; and high-visibility vests \$15.00 each. Contractor will deduct the cost through a deductive change order to the Subcontract Price. Once issued to a Subcontractor worker, a hard hat cannot be returned to Contractor for credit.

**6.1.8** To prevent distraction and promote awareness of surrounding conditions, Subcontractor shall not allow the use of radios, music players, headphones (except for hearing protection devices), or earbuds by its workforce at the site. Subcontractor shall limit the use of mobile

phones and similar communication devices to project-related matters.

## **6.2 DUTY TO REMEDY LOSSES**

**6.2.1** The Subcontractor is required to promptly remedy any loss or damage caused to the Subcontract Work, materials, equipment, and property referred to in clauses 6.1.1 (b) and 6.1.1 (c), if said loss or damage is not covered by builder's risk or other property insurance required under the Prime Contract, but only to the extent caused by the Subcontractor and/or persons or entities performing work for or on behalf of the Subcontractor, regardless of tier, who have furnished labor, materials, or services relating to the Subcontract and for whose acts the Subcontractor may be liable.

**6.2.2** The Subcontractor shall indemnify the Contractor for fines, or penalties imposed on the Contractor as a result of safety violations, but only to the extent that such fines, or penalties are caused by the Subcontractor's (or its subcontractor's or material supplier's) failure to comply with applicable safety requirements, and then only to the extent that such fines or penalties are determined to be the Subcontractor's (or its subcontractor's or material supplier's) responsibility based upon the particular failure of compliance cited, and not due to prior or repeated safety violations by the Contractor.

**6.3 SAFETY REPRESENTATIVE.** The Subcontractor is required to designate an individual at the site in the employ of the Subcontractor who shall act as the Subcontractor's designated safety representative with a duty to prevent accidents. Unless otherwise identified by the Subcontractor in writing to the Contractor, the designated safety representative shall be the Subcontractor's project superintendent.

**6.4 NO OVERLOADING.** The Subcontractor has an affirmative duty not to overload the structures or conditions at the site and shall take reasonable steps not to load any part of the structures or site so as to give rise to an unsafe condition or create an unreasonable risk of injury or property damage. Upon written request by Subcontractor, the Contractor shall provide loading information concerning the structures at the site.

**6.5 REPORTING ACCIDENTS AND NEAR MISSES.** The Subcontractor shall give prompt written notice to the Contractor of any accident involving personal injury requiring a physician's care, any property damage exceeding five hundred dollars (\$500.00) in value, or any failure that could have resulted in serious bodily injury, whether or not such an injury was sustained. Subcontractor shall furnish a detailed written report if requested by the Contractor.

**6.6 SAFE WORK AREAS.** Subcontractor is primarily responsible for (a) not creating and not allowing its sub-subcontractors to create an unsafe condition in the Subcontractor's work area or any other work area on the Project, (b) inspecting and identifying any unsafe conditions in the Subcontractor's work area, (c) protecting and safeguarding its employees and the employees of its sub-subcontractors from such unsafe conditions, (d) immediately notifying Contractor of such unsafe conditions, and (e) promptly correcting or eliminating such unsafe conditions. If an employee of the Subcontractor or an employee of a sub-subcontractor is injured by an unsafe condition in the Subcontractor's work area, the Subcontractor agrees that such any injury would constitute a breach of the Subcontractor's safety duties under the Subcontract.

## **6.7 MATERIALS SAFETY**

**6.7.1** If the Subcontractor encounters asbestos, polychlorinated biphenyl (PCB), or other hazardous substances at the site which potentially are harmful to persons or property, then the Subcontractor shall take all steps required by the Subcontract and by law to protect persons and property from injury or damage, including stopping the Subcontract Work in the affected areas and promptly advising the Contractor in writing of the conditions encountered at the site. If the Subcontractor stops work in any area of the Project as a result of hazardous substances located at the site, then the Subcontractor shall not resume its Subcontract Work in the affected area until (a) the hazardous substances have been removed or made harmless, (b) the Contractor and Subcontractor agree in writing to commence work in all or a portion of the area, (c) the Owner orders the work to proceed in the affected area and the parties agree, or (d) the matter is resolved through arbitration or litigation as provided for in this Subcontract. The Subcontractor shall not be required to perform work in areas containing asbestos, PCBs, or any other hazardous substances defined by the Subcontract, without the Subcontractor's consent.

**6.7.2** Safety Data Sheets ("SDS") as required by law and pertaining to materials or substances used or consumed in the performance of the Subcontract Work shall be submitted to the Contractor by the Subcontractor. SDS documents obtained by the Contractor from other subcontractors or sources shall be made available to the Subcontractor by the Contractor.

## **ARTICLE 7 LABOR RELATIONS**

**7.1 COLLECTIVE BARGAINING AGREEMENTS.** Contractor is signatory to collective bargaining agreements with the following unions: carpenters, cement finishers, ironworkers, laborers, masons, and operating engineers. The collective bargaining agreements contain subcontracting clauses that



prevent the Contractor from subcontracting work covered by the collective bargaining agreements to "non-union" subcontractors. For types of work covered by Contractor's collective bargaining agreements, Subcontractor (including its subcontractors) shall perform work at the Project site with workers covered by the appropriate collective bargaining agreement.

## **ARTICLE 8 SURETY BONDING**

### **8.1 SUBCONTRACTOR BONDS**

**8.1.1** If requested by Contractor, the Subcontractor shall furnish to the Contractor, as the named Obligor, appropriate surety bonds to secure the faithful performance of the Subcontract Work and to satisfy all Subcontractor payment obligations arising thereunder. The Subcontractor surety bond requirements, if any, applicable are contained in the Subcontract Agreement.

**8.1.2** If both a performance and payment bond are required of the Subcontractor under this Subcontract, then said bonds shall be in the full amount of the Subcontract Price, unless otherwise specified herein, and said bonds shall be in a form and by a surety mutually agreeable to the Contractor and Subcontractor.

**8.1.3** If not initially required by the Subcontract, the Subcontractor shall be reimbursed for the cost of any subsequently required performance and payment bonds. The reimbursement amount for the Subcontractor bonds shall not exceed the actual premium paid for the bonds, up to a maximum of 3% of Subcontract Price.

**8.1.4** In the event the Subcontractor shall fail to promptly provide any required bonds, the Contractor may terminate this Subcontract for cause and enter into a subcontract for the balance of the Subcontract Work with another subcontractor. All Contractor costs and expenses incurred by the Contractor as a result of said termination shall be paid by the Subcontractor.

## **ARTICLE 9 INSURANCE**

### **9.1 SUBCONTRACTOR'S INSURANCE.**

Subcontractor shall maintain the following minimum types and limits of insurance coverage with A.M. Best's A-; VII (or higher) rated insurer(s) that are lawfully licensed and authorized to do business in the jurisdiction in which the Project is located:

#### **(a) WORKERS' COMPENSATION AND EMPLOYERS LIABILITY**

1. Coverage A: Per State Statute
2. Coverage B: Each accident: \$100,000  
Disease:  
Policy Limit: \$500,000

Each Employee: \$100,000

3. Subcontractor waives all rights against Contractor and its employees for recovery of damages to the extent these damages are covered by the workers' compensation insurance obtained by Subcontractor pursuant to this Subcontract. Subcontractor shall obtain an endorsement equivalent to WC 00 03 13 to complement this waiver.

#### **(b) COMMERCIAL GENERAL LIABILITY**

1. Each Occurrence: \$1,000,000
2. General Aggregate: \$1,000,000
3. Products/Comp. Ops. Aggregate: \$1,000,000
4. Personal Injury: \$1,000,000
5. Coverage Requirements:

ISO occurrence form CG 00 01 (or equivalent coverage form) covering liability arising from premises, operations, independent contractors, products-completed operations, personal and advertising injury, liability assumed under an insured contract (including the tort liability of another assumed in a business contract) and contain a "per project" aggregate limits endorsement. There shall be no endorsement or modification of this policy limiting the scope of coverage for liability arising from explosion, collapse, underground property damage, damage to the named insured's work, or for any other type of operations or work being performed under this Subcontract Agreement.

#### **(c) COMMERCIAL AUTOMOBILE LIABILITY**

1. Combined Single Limit: \$1,000,000
2. Coverage Requirements:  
ISO accident form CA 00 01 (or equivalent coverage form) and shall cover liability arising out of any automobile.

#### **(d) PROFESSIONAL LIABILITY**

Required if the Subcontract Work includes engineering, design, or other professional services.

1. Each Claim: \$1,000,000
2. General Aggregate: \$1,000,000

#### **(e) UMBRELLA (EXCESS) LIABILITY**

1. Each Occurrence: \$1,000,000
2. General Aggregate: \$1,000,000
3. Coverage Requirements:

Provide excess liability over Commercial General Liability, Commercial Automobile Liability, and Employer's Liability policies.

## **9.2 ADEQUACY OF INSURANCE COVERAGE.**

Neither the Contractor nor the Owner warrants the adequacy of the types of insurance nor the limits of liability required. Minimum Subcontractor insurance requirements do not limit the Subcontractor's legal responsibilities and liabilities, or the limits of insurance required for the additional insured coverage.

## **9.3 ADDITIONAL INSURED COVERAGE.**

Subcontractor shall list the Contractor, Owner, and other entities listed on the sample certificate of insurance in Exhibit A as additional insureds under the Subcontractor's Commercial General Liability, Commercial Automobile Liability and Umbrella (Excess) Liability policies for the full policy limits available under each policy. Commercial General Liability and Umbrella (Excess) Liability additional insured coverage shall be provided by ISO forms CG 20101001 & CG 20371001 (or equivalent coverage forms). The Commercial Automobile Liability additional insured endorsement shall be provided by ISO form CA 20 48 (or equivalent coverage form). Any insurance coverage provided to the additional insureds under the Subcontractor's Commercial General Liability, Commercial Automobile Liability and Umbrella (Excess) Liability coverages shall be primary to and will not seek contribution from any other insurance available to the additional insureds where the additional insured is a named insured. The additional insured coverage shall apply to liability arising from any and all ongoing operations and products or completed operations of the Subcontractor. The additional insured coverage for the products/completed operations exposure shall continue to remain in force through the Statute of Repose or as long as this additional insured coverage is commercially available to the Subcontractor, but not less than three (3) years after the date of substantial completion of Subcontractor Work. Subcontractor shall require any sub-subcontractors to provide the same additional insured coverage in favor of the Contractor, Owner, and other entities as is required of the Subcontractor.

**9.4 CERTIFICATES OF INSURANCE.** Before starting any Subcontract Work under this Subcontract, Subcontractor shall deliver to Contractor a certificate of insurance evidencing all of the coverages that Subcontractor is required to maintain under this Subcontract and must contain all of the information listed on the sample certificate of insurance in Exhibit A, including (a) name & location of the project, (b) indication that the per project aggregate endorsement applies to Commercial General Liability limits, (c) Contractor, Owner, and other entities (as listed as additional insureds on sample certificate of insurance in Exhibit A) listed as additional insureds on all policies except workers compensation using ISO endorsements CG 20101001, CG 20371001 and CA 20 48, or

equivalent coverage forms, (d) copies of actual additional insured endorsements attached to certificate, (e) the following wording shall appear on the certificate: "Any coverage afforded the additional insureds under the above policies shall be primary to and will not seek contribution from any other insurance available to the additional insureds where the additional insured is a named insured" and (f) any other coverage or policy clarification as indicated on sample certificate of insurance in Exhibit A. Subcontractor shall furnish such certificate(s) as are necessary to confirm the required coverages and provisions through the completion of the Subcontract Work, and for one year after substantial completion of the Subcontract Work.

**9.5 WAIVER OF RIGHTS.** Subcontractor agrees to waive all rights (including but not limited to insurers' rights of subrogation) against the Contractor, Owner, the Owner's architect or engineer, the consultants, agents, and employees of any of them, separate contractors, and all other subcontractors for loss or damage to the extent covered by Builder's Risk or any other property insurance, except such rights as it may have to the proceeds of such insurance.

## **9.6 BUILDER'S RISK INSURANCE**

**9.6.1** It is the Subcontractor's responsibility to determine the extent of the property insurance coverage for the Subcontractor's Work as defined in the Prime Contract between the Owner and Contractor. Upon written request of the Subcontractor, the Contractor shall assist the Subcontractor in obtaining proof of property insurance or Builder's Risk coverage from the Owner or from any other party responsible for providing property insurance on the Subcontractor's Work.

**9.6.2** If the Owner or Contractor has not purchased Builder's Risk insurance required under the Prime Contract or Subcontract for the full insurable value of the Subcontract Work, then the Subcontractor may procure such insurance as shall protect the interests of the Subcontractor, its sub-subcontractors, and their subcontractors in the Subcontract Work. In such case the Contractor subsequently shall enter into an appropriate Subcontract change order reimbursing Subcontractor for the cost of such additional insurance.

**9.6.3** If not covered under the Builder's Risk policy of insurance or any other property or equipment insurance required by the Prime Contract or Subcontract Agreement, the Subcontractor shall procure and maintain at the Subcontractor's own expense property and equipment insurance for portions of the Subcontract Work stored off the site or in transit, when such portions of the Subcontract Work are to be included in an application for payment under Article 12.2.6.

**9.6.4** Any deductible amounts applicable within the property insurance on the Work shall be apportioned in

accordance with the terms and conditions of the Prime Contract between Owner and Contractor. In the absence of specific conditions, the deductible shall be borne by the Contractor, Subcontractor and supplier in direct proportion as their individual losses bear to the total loss in any one claim.

#### **ARTICLE 10 INDEMNIFICATION**

**10.1** To the fullest extent permitted by law, the Subcontractor shall defend, indemnify, and hold harmless the Contractor, Owner, and Architect/Engineer, and their agents, architects, engineers, consultants, directors, officers, and employees, from and against any claims, losses, costs, and damages arising from: (a) any negligent acts or omissions of the Subcontractor or its employees or anyone for whose acts the Subcontractor may be liable with respect to the Subcontract Work or any activities relating to the Subcontract Work or this Subcontract; or (b) a breach of this Subcontract by the Subcontractor. The duty to indemnify and hold harmless shall be limited to the extent of the negligence or breach of contract by Subcontractor and those for whose acts it may be liable with respect to the Subcontract Work.

**10.1.1** As a supplement to the foregoing indemnification provision, and to the fullest extent permitted by law, the Subcontractor also agrees to defend, indemnify, and hold harmless Contractor and Owner from any claims, losses, costs, and damages that either Contractor or Owner incurs as the result of (a) Contractor's or Owner's own negligent acts or omissions in failing to properly supervise, inspect, detect deficiencies in, or approve the Subcontractor Work, or Subcontractor's work area, or the work areas of anyone for whose acts the Subcontractor may be liable, or (b) any alleged violation of any Safe Place Statute duties required of the Owner or Contractor with respect to the Subcontractor's employees or employees of any sub-subcontractor to Subcontractor.

**10.2** In claims against Contractor, Owner, or Architect by an employee of the Subcontractor or anyone for whose acts the Subcontractor may be liable, the indemnification obligation in Paragraph 10.1 and 10.1.1 shall not be limited or reduced by a limitation on the amount or type of damages, compensation or other benefits payable by or for the Subcontractor, or any sub-subcontractor to Subcontractor, under workers' compensation acts or any other employee benefits acts.

#### **ARTICLE 11 CHANGES**

##### **11.1 CHANGES**

**11.1.1 SUBCONTRACT CHANGE.** A Subcontract Change is any change in the Subcontract Work within the general scope of the Subcontract including a

change in the drawings, specifications, or technical requirements of the Subcontract and an associated change in the Schedule of Work. When the Contractor orders a Subcontract Change in writing, the Subcontractor, without nullifying this Subcontract, shall perform such Subcontract Change. The change to the Subcontract and associated adjustments in the Subcontract Price and Subcontract Time, if any, resulting from such changes shall be set forth in a Subcontract Change Order or a Subcontract Construction Change Directive. No such adjustments shall be made for any changes performed by the Subcontractor that have not been ordered by the Contractor. Changes to Subcontract Time shall be set forth in the Schedule of Work, as indicated in Article 4 above.

**11.1.2 CHANGE ORDER.** A Subcontract Change Order is a written instrument prepared by Contractor to make a record of a Subcontract Change, including any associated adjustments in Subcontract Price and Subcontract Time.

**11.1.3 SUBCONTRACT CONSTRUCTION CHANGE DIRECTIVE.** A Subcontract Construction Change Directive is a written instrument prepared and signed by the Contractor directing a change in the Subcontract Work and stating a proposed associated adjustment, if any, in the Subcontract Price and Subcontract Time. A Subcontract Construction Change Directive shall be used in the absence of agreement on the terms of a Subcontract Change Order.

The Subcontractor shall comply with all Subcontract Construction Change Directives received from the Contractor and perform the required changes in the Subcontract Work in a prompt and expeditious manner. The Subcontractor shall evaluate the proposed adjustment in the Subcontract Price if any, as set forth in the Subcontract Construction Change Directive and respond, in writing, to the Contractor stating the Subcontractor's acceptance or rejection of the proposed adjustment and the reasons therefor.

The Subcontractor may agree to the Subcontract Construction Change Directive and the terms of the proposed adjustment, if any, by signing the Subcontract Construction Change Directive and returning it to the Contractor.

**11.1.4 ADJUSTMENT IN SUBCONTRACT PRICE.** Where the Contractor issues a Construction Change Directive, an adjustment in the Subcontract Price shall be the Subcontractor's net cost plus a 10% markup for both overhead and profit, unless the Prime Contract provides for a different price or method for compensation.

**11.1.5 SUBSTANTIATION OF ADJUSTMENT.** The Subcontractor's quote for the adjustment in the Subcontract Price shall be substantiated with

quantities, hours, hourly rates, material invoices, etc., in sufficient detail for the Contractor to determine the reasonableness of the amount requested.

**11.1.6 INCIDENTAL CHANGES IN THE SUBCONTRACT WORK.** The Contractor may direct the Subcontractor to perform incidental changes in the Subcontract Work that do not involve adjustments in the Subcontract Price or Subcontract Time. Incidental changes shall be consistent with the scope and intent of the Subcontract. The Contractor shall initiate an incidental change in the Subcontract Work by issuing a written Subcontract Work Order to the Subcontractor. Such written Subcontract Work Orders shall be carried out promptly and are binding on the parties.

## **ARTICLE 12 PAYMENT**

### **12.1 GENERAL PROVISIONS**

**12.1.1 SCHEDULE OF VALUES.** Within twenty (20) calendar days from the date of execution of the Subcontract Agreement, the Subcontractor shall prepare and submit to the Contractor a Schedule of Values apportioned to the various divisions or phases of the Subcontract Work. Each line item contained in the Schedule of Values shall be assigned a monetary price such that the total of all such items shall equal the Subcontract Price. Such Schedule of Values shall account for any reasonable instructions or guidance from Contractor regarding the apportionment, and shall be prepared in such detail as may be required by the Contractor and supported by such documents and proof as the Contractor may require.

**12.1.2 PAYMENT USE AND VERIFICATION.** The Subcontractor is required to pay for all labor, materials, and equipment used in the performance of the Subcontract Work through the most current period applicable to progress payments received from the Contractor. Reasonable evidence, satisfactory to the Contractor, may be required to show that all obligations relating to the Subcontract Work are current before releasing any payment due on the Subcontract Work. If required by the Contractor, before final payment is made for the Subcontract Work, the Subcontractor shall submit evidence satisfactory to the Contractor that all payrolls, bills for materials and equipment, and all known indebtedness connected with the Subcontract Work, have been paid or otherwise satisfied as set forth in Paragraph 12.3.2. The Contractor shall have the right at all times to contact the Subcontractor's subcontractors, suppliers, workforce representatives, fringe benefit funds, and other persons or entities entitled to payment from Subcontractor to insure that they are being paid by the Subcontractor for labor and materials furnished for use in performing the Subcontract Work.

**12.1.3 PAYMENT NOT ACCEPTANCE.** Payment to the Subcontractor does not constitute or imply acceptance of any portion of the Subcontract Work.

### **12.2. PROGRESS PAYMENTS**

**12.2.1 APPLICATIONS.** Subcontractor's applications for payment shall be itemized and supported by the Subcontractor's Schedule of Values. Subcontractor shall use the Application for Payment forms provided by the Contractor.

**12.2.2. PARTIAL LIEN WAIVERS AND AFFIDAVITS.** Contractor may provide partial lien waiver forms with each payment. Subcontractor is to sign lien waivers in a form acceptable to Contractor and Owner and return to Contractor in a timely manner. Upon request, Subcontractor shall provide lien waivers of its subcontractors and material suppliers prior to payment.

**12.2.3. REJECTION OF SUBCONTRACTOR'S PAYMENT APPLICATION.** The Contractor may reject a Subcontractor payment application or nullify a previously approved Subcontractor payment application, in whole or in part, as may reasonably be necessary to protect the Contractor from loss or damage based upon:

- (a) the Subcontractor's failure to perform the Subcontract Work as required by the Subcontract;
- (b) loss or damage arising out of or relating to the Subcontract and caused by the Subcontractor to the Owner, Contractor or others;
- (c) the Subcontractor's failure to properly pay for labor, materials, equipment, or supplies furnished in connection with the Subcontract Work;
- (d) rejected, nonconforming, or defective Subcontract Work that has not been corrected in a timely fashion;
- (e) reasonable evidence of delay in performance of the Subcontract Work such that the Subcontract Work shall not be completed within the Subcontract Time, and that the unpaid balance of the Subcontract Price is not sufficient to offset the liquidated damages or actual damages that may be sustained by the Contractor as a result of the anticipated delay caused by the Subcontractor;
- (f) reasonable evidence demonstrating that the unpaid balance of the Subcontract Price is insufficient to cover the cost to complete the Subcontract Work;



- (g) third party claims involving the Subcontractor or reasonable evidence demonstrating that third party claims are likely to be filed unless and until the Subcontractor furnishes the Contractor with adequate security in the form of a surety bond, letter of credit, or other collateral or commitment which are sufficient to discharge such claims if established.

The Contractor shall give notice to the Subcontractor, at the time of disapproving or nullifying an application for payment, of the specific reasons therefor. When the above reasons for disapproving or nullifying an application for payment are removed, payment shall be made for amounts previously withheld.

**12.2.4 RETAINAGE/SECURITY.** The rate of retainage shall be 10%.

**12.2.5 TIME OF APPLICATION.** For each progress payment period, the Subcontractor shall submit its progress payment application to the Contractor for the Subcontract Work performed to date no later than the 23<sup>rd</sup> of the month. To the extent allowed under Paragraph 12.2.6 of this Subcontract Agreement, the Subcontractor may include in its progress payment applications to the Contractor materials and equipment suitably stored at the site or elsewhere for incorporation into the Subcontract Work.

**12.2.6 STORED MATERIALS AND EQUIPMENT.** Unless otherwise provided in the Subcontract, applications for payment may include materials and equipment not incorporated into the Subcontract Work but delivered to and suitably stored at the site. Applications for payment may include materials and equipment delivered to and suitably stored off site, if allowed under the Prime Contract and properly approved. Approval of payment applications for materials and equipment stored on or off site shall be conditioned on submission by the Subcontractor of bills of sales, supplier invoices to support amount requested, and applicable insurance or such other procedures satisfactory to the Owner and Contractor to establish the proper valuation of the stored materials and equipment, the Owner's title to such materials and equipment, and to otherwise protect the Owner's and Contractor's interests herein, including transportation to the site.

**12.2.7 TIME OF PAYMENT.** Progress payments to the Subcontractor for satisfactory performance of the Subcontract Work may be delayed no later than seven (7) calendar days after receipt by the Contractor of payment from the Owner for the Subcontract Work (pay when paid).

## **12.3 FINAL PAYMENT**

**12.3.1 APPLICATION.** Upon acceptance of the Subcontract Work by the Contractor, and upon the

Subcontractor furnishing evidence of fulfillment of the Subcontractor's obligations in accordance with the Subcontract, the Contractor shall incorporate the Subcontractor's application for final payment into the Contractor's next application for payment to the Owner without delay, or notify the Subcontractor if there is delay and the reasons therefor.

**12.3.2 REQUIREMENTS.** Before the Contractor shall be required to incorporate the Subcontractor's application for final payment into the Contractor's next application for payment to the Owner, the Subcontractor shall furnish to the Contractor:

- (a) if required by the Subcontract, an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Subcontract Work for which the Owner or its property or the Contractor or the Contractor's surety might in any way be liable, have been paid or otherwise satisfied;
- (b) consent of the Subcontractor's surety to final payment, if required;
- (c) satisfaction of closeout procedures as may be required by the Subcontract;
- (d) certification that insurance required by the Subcontract remain in effect beyond final payment pursuant to this Subcontract Agreement is in effect and shall not be canceled or allowed to expire without at least thirty (30) calendar days written notice to the Contractor, unless a longer period is stipulated in the Subcontract; and
- (e) other data if required by the Contractor, such as receipts, releases, and waivers of liens effective upon payment to the extent and in such form as may be designated by the Contractor. Acceptance of final payment by the Subcontractor shall constitute a waiver of claims by the Subcontractor.

**12.3.3 TIME OF PAYMENT.** Final payment of the balance due of the Subcontract Price, may be delayed until seven (7) calendar days after receipt by the Contractor of final payment from the Owner for such Prime Contract Subcontract Work (pay when paid).

**12.4 BOND AND MECHANIC'S LIEN RIGHTS.** In the event that any applicable law, statute, regulation or bond requires Subcontractor to take any action prior to the expiration of the reasonable time for payment referenced in Paragraphs 12.2.7 and in order of preserve or protect the Subcontractor's rights, if any, with respect to mechanic's liens or bond claims, then the Subcontractor may take that action prior to the expiration of the reasonable time for payment and such action shall not be in violation of this Subcontract nor

considered premature for purposes of preserving and protecting the Subcontractor's rights.

**12.5 PAYMENT ADJUSTMENTS.** Subcontractor agrees that Contractor may withhold full or partial payment from the Subcontract Price, for any of the following reasons: (a) Subcontractor's failure to complete all punch list items, turnover packages and closeout documentation designated by Contractor or Owner, (b) defective Subcontract Work not immediately remedied by Subcontractor (including defects discovered by Contractor or Owner subsequent to final payment), (c) failure of Subcontractor to make payments properly to sub-subcontractors or for labor, materials or equipment, or the failure to obtain or deliver lien releases in recordable form, (d) damage to the Subcontract Work, or work or property of the Contractor, another contractor, subcontractor, or adjacent landowners, (e) failure to carry out the Subcontract Work in accordance with this Subcontract Agreement (f) any liens filed against the Project, (g) other breaches of this Subcontract by Subcontractor, (h) failure to promptly correct any warranty-related defects, (i) the suspension or termination for cause of Subcontractor, or (j) any claims by Contractor/Owner against the Subcontractor or its sub-subcontractors. Contractor may also withhold payment if the Owner does not accept Subcontractor's Subcontract Work. If Subcontract Work is deficient, Contractor may use its own forces to complete the Subcontract Work and backcharge Subcontractor for the cost of this Subcontract Work.

## **ARTICLE 13 CLAIMS**

### **13.1 CLAIMS**

**13.1.1 CLAIM.** A claim is a demand or assertion made in writing by the Contractor or the Subcontractor seeking an adjustment in the Subcontract Price and/or Subcontract Time, an adjustment or interpretation of the Subcontract terms, or other relief arising under or relating to this Subcontract, including the resolution of any matters in dispute between the Contractor and Subcontractor in connection with the Project.

**13.1.2. CLAIMS RELATING TO OWNER.** The Subcontractor agrees to make all claims against the Contractor for which the Owner is or may be liable in the same manner and within the time limits provided in the Prime Contract for like claims by the Contractor against the Owner and in sufficient time for the Contractor to make such claims against the Owner in accordance with the Contract. Contractor in its sole discretion may elect to submit such a claim to Owner. Subcontractor shall have no recourse against Contractor for any failure to submit or pursue such a claim against Owner. If Contractor does not submit such a claim to Owner, or if the disposition of such a claim by Owner is not acceptable to Subcontractor, then the claim shall be considered unresolved and

Subcontractor may pursue its rights (if any) with respect to the claim against Contractor, under the Dispute Resolution provisions of this Subcontract.

**13.1.3 CLAIMS RELATING TO CONTRACTOR.** The Subcontractor shall give the Contractor written notice of all claims within seven (7) calendar days of the date when the Subcontractor knew of the facts giving rise to the event for which claim is made; otherwise, such claims shall not be valid.

**13.1.4 UNRESOLVED CLAIMS, DISPUTES AND OTHER MATTERS.** All unresolved claims, disputes and other matters in question between the Contractor and Subcontractor, not relating to claims included in Paragraph 3.14, shall be resolved in the manner provided in Article 14 herein.

**13.2 ADDITIONAL SERVICES RENDERED OR MATERIALS FURNISHED BY CONTRACTOR.** The Contractor agrees that, except as otherwise provided in this Subcontract, no claim for additional services rendered or materials furnished to the Subcontractor shall be valid unless the Contractor gives the Subcontractor:

- (a) Notice prior to the furnishing of the services and/or materials, except in an emergency affecting the safety of persons or property; and
- (b) Written compilations of the charges relating to such services or materials within sixty (60) days after the services are rendered or materials furnished.

## **ARTICLE 14 DISPUTE RESOLUTION**

**14.1 INITIAL DISPUTE RESOLUTION.** If a dispute arises out of or relates to this Subcontract, or the breach thereof, the parties may endeavor to settle the dispute first through direct discussions. If the dispute cannot be settled through direct discussions, the parties may endeavor to settle the dispute by mediation, by a mediator agreeable to both parties, before recourse to arbitration. Unless the parties agree otherwise, the mediation shall be conducted in accordance with the Construction Mediation Rules of the American Arbitration Association. Mediation shall be commenced within the time limits for arbitration stipulated in the Subcontract. The time limits for initiating any subsequent arbitration shall be extended for the duration of the mediation process plus fourteen (14) calendar days, or as otherwise provided in the Subcontract. Issues to be mediated are subject to the exceptions in Paragraph 14.3 for arbitration. The location of the mediation shall be the same as the location for arbitration identified in Paragraph 14.2.

**14.2 AGREEMENT TO ARBITRATE.** All claims, disputes, and other matters in question arising out of, or

relating to this Subcontract Agreement or the breach thereof, shall be decided by arbitration in accordance with Construction Industry Arbitration Rules of the American Arbitration Association then in force or by legal action in Wisconsin State Court (Rock County), at the option of the Contractor to choose arbitration or legal action. For projects outside of Wisconsin, the parties agree that all claims, disputes and other matters in question arising out of, or relating to this Subcontract Agreement or the breach thereof, shall be decided by arbitration in accordance with Construction Industry Arbitration Rules of the American Arbitration Association then in force. If the parties cannot agree on the choice of an arbitrator, the parties shall use the American Arbitration Association to conduct any arbitration. Any arbitration shall be held in Rock County, Wisconsin. Any award rendered by the arbitrator(s) shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereto. The fee, if any, of the arbitrator(s), shall be shared equally by both parties. Notwithstanding other provisions in this Subcontract, or choice of law provisions to the contrary, any arbitration shall be governed by the Federal Arbitration Act, 9 U.S.C. § 1 et seq., which shall not be superseded or supplemented by any other arbitration act, statute or regulation.

**14.3. CONSOLIDATION.** The Subcontractor agrees that any arbitration instituted under this Article 14 may, at the Contractor's election, be consolidated with any other arbitration proceeding involving a common question of fact or law between the Contractor and any other subcontractor(s) performing work in connection with the Contract. In any dispute concerning the application of this Paragraph 14.3, the question of arbitrability shall be decided by the appropriate court and not by arbitration.

**14.4 NOTICE OF DEMAND.** Notice of demand for arbitration shall be filed in writing with the other party to this Subcontract. The demand for arbitration shall be made as required in the Subcontract or within a reasonable time after written notice of the claim, dispute or other matter in question has been given, but in no event shall it be made when institution of legal or equitable proceedings based on such claim, dispute or other matter in question would be barred by the applicable statutes of limitation.

**14.5 AWARD.** Any award rendered by the arbitrator(s) shall be final and judgment may be entered upon it in accordance with the Federal Arbitration Act in any court having jurisdiction.

**14.6 WORK CONTINUATION AND PAYMENT.** The Subcontractor shall carry on the Subcontract Work and maintain the Schedule of Work pending final resolution of a claim including arbitration or legal action, unless the Subcontract has been terminated or the Subcontract Work suspended as provided for in the Subcontract, or the parties otherwise agree in writing to

a partial or total suspension of the Subcontract Work. If the Subcontractor is continuing to perform in accordance with the Subcontract, the Contractor shall continue to make payments as required by the Subcontract.

**14.7 ATTORNEY'S FEES.** Should either party engage an attorney to institute suit or demand arbitration to enforce any of the provisions hereof, to protect its interest in any manner arising under this Subcontract, or to recover on a surety bond furnished by the Subcontractor, the prevailing party shall be entitled to recover reasonable attorneys' fees, costs, charges, and expenses expended or incurred therein.

## **TERMINATION AND SUSPENSION; BANKRUPTCY**

### **15.1 SUSPENSION BY CONTRACTOR**

**15.1.1** If Owner suspends the work of Contractor under the Prime Contract; Contractor may suspend the performance of the Subcontract or any portion thereof for a period of not more than 90 consecutive days, by giving notice in writing to Subcontractor of such suspension. Subcontractor shall resume the Subcontract Work when instructed by Contractor to do so. Subcontractor shall be granted an adjustment in the Subcontract Price or an extension of the Subcontract Time, or both, directly attributable to any such suspension only to the extent that Contractor receives an adjustment of the Prime Contract price or the Prime Contract time for the Subcontractor's proportionate share of work under the Prime Contract.

**15.1.2** Contractor may suspend the Subcontract Work for a period of not more than 90 days, or to the extent permitted by the progress schedule or any express provision of the Subcontract, for Contractor's own purposes.

### **15.2 TERMINATION BY CONTRACTOR FOR CAUSE**

**15.2.1** If Subcontractor is in material breach of the Subcontract, Contractor may terminate the Subcontract after giving Subcontractor three days written notice of Contractor's intent to terminate. Material breaches of the Subcontract include but are not limited to the following: Subcontractor's failure to perform the Subcontract Work in conformance with the requirements of the Subcontract Documents; Subcontractor's refusal or failure to supply enough properly skilled workers, proper materials, maintain progress according to the Schedule of Work, or meet the Subcontract Time requirements; Subcontractor's failure to make prompt payment to its workers (including fringe benefits and payroll taxes), its subcontractors, or its suppliers; and Subcontractor's disregard of laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction. Upon termination of the Subcontract, Contractor may:

- (a) Exclude Subcontractor from the site, and take possession of the Subcontract Work and of all Subcontractor's tools, appliances, construction equipment, and machinery at the site, and use the same to the full extent they could be used by Subcontractor.
- (b) Take possession of and incorporate in the Subcontract Work all materials and equipment for which Contractor has paid Subcontractor, whether at the site or stored elsewhere; and
- (c) Complete the Subcontract Work as Contractor may deem expedient.

**15.2.2** If Contractor has terminated the Subcontract for cause, Subcontractor shall not be entitled to receive any further payment until the Subcontract Work is completed. If the unpaid balance of the Subcontract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, all court or arbitration or other dispute resolution costs, and reasonable overhead and profit attributable to completion of the Subcontract Work) sustained by Contractor arising out of or relating to completing the Subcontract Work, such excess will be paid to Subcontractor. If such claims, costs, losses, and damages exceed such unpaid balance, Subcontractor shall pay the difference to Contractor. When exercising any rights or remedies under this paragraph, Contractor shall not be required to obtain the lowest price for the Subcontract Work performed.

**15.2.3** The Subcontract will not be terminated if Subcontractor corrects its failure to perform in the three days following receipt of the notice of Contractor's intent to terminate. If the Subcontractor fails to cure in the three days after receipt of said notice, the Subcontract shall be deemed terminated.

**15.2.4** Where Subcontractor's services have been terminated for cause by Contractor, the termination will not affect any rights or remedies of Contractor against Subcontractor then existing or which may thereafter accrue. Any retention or payment of money due Subcontractor by Contractor will not release Subcontractor from liability.

**15.2.5** If Subcontractor has provided a performance bond, the notice of intent, default, and termination procedures (if any) of that bond shall supersede any conflicting procedures in this Paragraph 15.2, and Contractor may satisfy its procedural obligations by complying with the superseding performance bond requirements.

**15.3 TERMINATION OR REJECTION OF SUBCONTRACT BY OWNER.** The Contractor may terminate the Subcontract if the Owner terminates the Prime Contract (or a part of the Prime Contract affecting

the Subcontract), or if Owner rejects the Subcontract in accordance with the terms of the Prime Contract. For purposes of payment of Subcontractor, such a termination shall be treated as a termination for convenience if it is not attributable to any default or breach by Subcontractor, and as a termination for cause if it is so attributable.

**15.4 TERMINATION BY CONTRACTOR FOR CONVENIENCE.** Upon seven days written notice to Subcontractor, Contractor may, without cause and without prejudice to any other right or remedy of Contractor, terminate the Subcontract. In such case, Subcontractor 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, and Subcontractor shall be paid for the following (without duplication of any items):

- (a) Completed and acceptable Subcontract Work executed in accordance with the Subcontract prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Subcontract Work;
- (b) Expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Subcontract in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
- (c) Reasonable expenses directly attributable to termination.

**15.5 TERMINATION BY SUBCONTRACTOR.** If Contractor fails to pay Subcontractor within 60 days after Owner has paid Contractor an amount due and owing to Subcontractor, or if more than 180 days have passed since Subcontractor's submittal of an uncontested pay application, then Subcontractor may terminate the Subcontract by giving notice to Contractor. Subcontractor shall be entitled to be paid all amounts due and owing, and, to the extent not already compensated, for the following (without duplication of any items):

- (a) completed and acceptable Subcontract Work executed in accordance with the Subcontract prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Subcontract Work;
- (b) expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Subcontract in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
- (c) reasonable expenses directly attributable to termination.



## **15.6 BANKRUPTCY**

**15.6.1 TERMINATION ABSENT CURE.** If Subcontractor files a petition under the Bankruptcy Code, has a petition filed against it under the Bankruptcy Code (or any state equivalent such as Chapter 128 of the Wisconsin Statutes), has or seeks the appointment of a receiver, or is insolvent, this Subcontract shall terminate if the Subcontractor or the Subcontractor's trustee rejects the Subcontract or, if there has been a default, the Subcontractor is unable to give adequate assurance that the Subcontractor will perform as required by this Subcontract or otherwise is unable to comply with the requirements for assuming this Subcontract.

**15.6.2 INTERIM REMEDIES.** If the Subcontractor is not performing in accordance with the Schedule of Work at the time a petition in bankruptcy (or any state equivalent such as Chapter 128 of the Wisconsin Statutes), or a request for receivership is filed or is filed against it, or at any subsequent time, the Contractor, while awaiting the decision of the Subcontractor, receiver, or its trustee to reject or to assume this Subcontract and provide adequate assurance of its ability to perform hereunder, may avail itself of such remedies under this Article as are reasonably necessary to maintain the Schedule of Work. The Contractor may offset against any sums due or to become due the Subcontractor under the Subcontract all costs incurred in pursuing any of the remedies provided hereunder, including, but not limited to, reasonable overhead, profit, and attorneys' fees. The Subcontractor shall be liable for the payment of any amount by which such expense may exceed the unpaid balance of the Subcontract Price.

**15.7 STOPPAGE OF WORK.** Should the Owner order the Contractor in writing to stop the performance of the Prime Contract or any portion which affects the Subcontract Work due to any act or omission of the Contractor, or any other person or entity for whose acts or omissions to the Contractor may be liable, then the Contractor shall so notify the Subcontract in writing and upon written notification the Subcontractor shall stop that portion of the Subcontract Work as ordered by the Contractor.

**15.8 CONTINGENT ASSIGNMENT OF SUBCONTRACT.** The Contractor may assign this Subcontract to the Owner if required to do so under the Prime Contract. The assignment shall be effective only when the Owner: (a) has terminated the Prime Contract for cause, and (b) has accepted the assignment by notifying the Subcontractor in writing. The contingent assignment is subject to the prior rights of a surety that may be obligated under the Contractor's bond, if any. Subcontractor hereby consents to such assignment and agrees to be bound to the Owner, as assignee, by the terms of this Subcontract.

**THIS PAGE INTENTIONALLY BLANK**

SECTION 00 61 00  
BONDS

1.1 Description

- A. If requested by Rock County or the Construction Manager, subcontractor shall furnish a 100% Performance and Payment Bond and a 100% Labor and Material Bond made in favor of the Construction Manager and Rock County for the awarded work categories at the time the subcontract is executed, excluding responsibility for materials purchased directly by the Owner. The cost of said bonds should be identified as a separate added cost on the bid form.

1.2 Procedure

- A. Subcontractor shall have its surety company execute the performance and payment bonds.
- B. The surety on the bonds shall be licensed to do business in the State of Wisconsin. The surety shall be listed by the U.S. Treasury Department as accepted for bonding Federal projects and the bond amount must be within the limit set by the Treasury Department as the maximum amount allowed on any single contract.
- C. The surety's attorney-in-fact signing the bonds shall attach a current and valid certified copy of his power of attorney to each of the bonds.
- D. Each bond shall be in a sum equal to 100% of the subcontract price.
- E. Each bond shall be dated the same date as the subcontract agreement.
- F. The subcontractor shall return three properly executed copies of the performance and payment bonds to the Construction Manager as stated in paragraph 1.1 titled description.
- G. Each subcontractor shall post the Construction Manager subcontract number on the upper right hand corner of the Performance Bond and the Labor and Material Payment Bond.

## **SUBCONTRACT PERFORMANCE BOND**

Any singular reference to Principal, Surety, Obligor or other party shall be considered plural where applicable:

**PRINCIPAL (SUBCONTRACTOR)**

Name and Address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SURETY**

Name and Address of Surety Company Office:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**OBLIGEE (CONTRACTOR)**

J.P. Cullen & Sons, Inc.  
PO Box 5957  
Janesville, WI 53547-5957

**SUBCONTRACT**

Date:

Amount:

Description of Project:

**BOND**

Date (Not earlier than Subcontract Date):

Penal Amount:

SUBCONTRACTOR AS PRINCIPAL:

Company: \_\_\_\_\_

SURETY:

Company: \_\_\_\_\_

(corporate seal)

(corporate seal)

Signature: \_\_\_\_\_

Name and Title: \_\_\_\_\_

Signature: \_\_\_\_\_

Name and Title: \_\_\_\_\_

Witness: \_\_\_\_\_

(Any additional signatures appear on page attached)

Witness: \_\_\_\_\_

**FOR INFORMATION ONLY**

AGENT or BROKER:

(Name, Address and Telephone)

## Articles

1. **SCOPE OF BOND.** The Principal and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Obligor for the performance of the Subcontract, which is incorporated in this bond by reference. The Surety's total obligation shall not exceed the penal amount of this bond, except if Surety fails to remedy the Principal's default in accordance with Paragraph 4. If Surety fails to remedy the Principal's default in accordance with Paragraph 4, then Surety shall pay Obligor all attorneys' fees and costs incurred by Obligor in enforcing surety's obligations hereunder, and such obligation shall be in addition to and not a part of the penal amount of this bond.
2. **EFFECT OF OBLIGATION.** If the Principal performs the Subcontract, then this bond shall be null and void; otherwise it shall remain in full force and effect.
3. **ALTERATION NOTICE WAIVER.** The Surety hereby waives notice of any alteration or extension of the Subcontract, including but not limited to the Subcontract price and/or time, made by the Obligor. This waiver shall not apply to the time for suit provided by paragraph 6 hereunder.
4. **PRINCIPAL DEFAULT.** Whenever the Principal shall be, and is declared by the Obligor to be, in default under the Subcontract for the Obligor not having performed its obligations in the Subcontract, the Surety shall meet with the Obligor not later than seven (7) calendar days after receiving the Obligor's written notice of default to discuss whether the Surety will timely and without delay to the project (i) remedy the default immediately, (ii) Complete the Subcontract Work, or (iii) pay Obligor the cost incurred and to be incurred for completing the Subcontract Work. If Surety has not remedied the default, within fifteen (15) calendar days following receipt of such written declaration of default, Surety shall:
  - 4.1 **COMPLETE THE SUBCONTRACT.** Complete the Subcontract in accordance with its terms and conditions; or
  - 4.2 **OBTAIN NEW CONTRACTOR(S).** Obtain a bid or bids formally, informally or negotiated for completing the Subcontract Work in accordance with the Subcontractor's terms and conditions, and upon determination by the Surety of the lowest responsible bidder, or negotiated proposal, or, if the Obligor elects, upon determination by the Obligor and the Surety jointly of the lowest responsible bidder, or negotiated proposal, arrange for a contract between such party and the Obligor. The Surety will make available as work progresses sufficient funds to pay the cost of completion less the balance of the contract price. The cost of completion includes responsibilities of the Principal for correction of defective work and completion of the Subcontract; the Obligor's legal and design professional costs resulting directly from the Principal's default, and; liquidated damages or actual damages if no liquidated damages are specified in the Subcontract. The term "balance of the contract price," as used in this paragraph, shall mean the total amount payable by the Obligor to the Principal under the Subcontract and any amendments to it, less the amount properly paid by the Obligor to the Principal; or

- 4.3 **PAY OBLIGEE.** Determine the amount for which it is liable to the Obligee and pay the Obligee that amount as soon as practicable; or
- 4.4 **DENY LIABILITY.** Deny its liability in whole or in part and notify and explain to the Obligee the reasons why the Surety believes it does not have responsibility for this liability.

During the period of Surety's investigation allowed in Paragraph 4, Obligee shall have the right, but not the obligation, to perform and/or correct Principal's Subcontract Work. Any costs incurred by Obligee shall be deducted from the balance of the Subcontract Price. Surety's liability under this Bond shall not exceed, in the aggregate, the penal amount of this Bond, as adjusted pursuant to Paragraph 2 above.

- 5. **TIME FOR SUIT.** Any suit under this bond must be instituted before the expiration of two (2) years from the date of substantial completion as established by the contract documents.
- 6. **RIGHT OF ACTION.** No right of action shall accrue on this bond to or for the use of any person or entity other than the Obligee named herein, its heirs, executors, administrators or successors.

THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA



---

## SUBCONTRACT PAYMENT BOND

---

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

---

PRINCIPAL (SUBCONTRACTOR)  
(Name and Address):

SURETY (Name and Address of Surety  
Company Office):

OBLIGEE (CONTRACTOR)  
(Name and Address):

SUBCONTRACT

Date:  
Amount: \$  
Description of Project (Name and Location):

BOND

Date (Not earlier than Subcontract Date):  
Penal Amount: \$

SUBCONTRACTOR AS PRINCIPAL  
Company:

(Corporate Seal)

SURETY  
Company:

(Corporate Seal)

Signature: \_\_\_\_\_  
Name and Title:

Signature: \_\_\_\_\_  
Name and Title:  
Attach Power of Attorney

Witness: \_\_\_\_\_  
(Any additional signatures appear on page attached)

Witness: \_\_\_\_\_

---

FOR INFORMATION ONLY  
AGENT or BROKER:  
(Name, Address and Telephone)

**THIS PAGE INTENTIONALLY BLANK**



SECTION 00 70 00  
GENERAL CONDITIONS

A. AIA Document A201-2017 – Attached



# AIA® Document A201® – 2017

## General Conditions of the Contract for Construction

for the following **PROJECT:**  
(Name and location or address)

Rock County Jail and Law Enforcement Services Expansion  
200 East U.W. Highway 14  
Janesville, WI 53545

**THE OWNER:**  
(Name, legal status and address)

Rock County Wisconsin  
51 S Main St  
Janesville WI 53546

**THE ARCHITECT:**  
(Name, legal status and address)

Venture Architects  
212 North 25<sup>th</sup> Street  
Milwaukee WI 53233

### ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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.

### TABLE OF ARTICLES

1	GENERAL PROVISIONS
2	OWNER
3	CONTRACTOR
4	ARCHITECT
5	SUBCONTRACTORS
6	CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
7	CHANGES IN THE WORK
8	TIME
9	PAYMENTS AND COMPLETION
10	PROTECTION OF PERSONS AND PROPERTY
11	INSURANCE AND BONDS
12	UNCOVERING AND CORRECTION OF WORK

Init. / AIA Document A201® – 2017. Copyright © 1911, 1915, 1916, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No. 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

- 13 MISCELLANEOUS PROVISIONS
- 14 TERMINATION OR SUSPENSION OF THE CONTRACT
- 15 CLAIMS AND DISPUTES

Init.

/

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No.2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335526)

2

## INDEX

(Topics and numbers in bold are Section headings.)

### Acceptance of Nonconforming Work

9.6.6, 9.9.3, **12.3**

### Acceptance of Work

9.6.6, 9.8.2, 9.9.3, 9.10.1, 9.10.3, **12.3**

### Access to Work

**3.16**, 6.2.1, **12.1**

### Accident Prevention

**10**

### Acts and Omissions

3.2, 3.3.2, 3.12.8, 3.18, 4.2.3, 8.3.1, 9.5.1, 10.2.5, 10.2.8, 13.3.2, 14.1, 15.1.2, 15.2

### Addenda

1.1.1

### Additional Costs, Claims for

3.7.4, 3.7.5, 10.3.2, 15.1.5

### Additional Inspections and Testing

9.4.2, 9.8.3, 12.2.1, **13.4**

### Additional Time, Claims for

3.2.4, 3.7.4, 3.7.5, 3.10.2, 8.3.2, **15.1.6**

### Administration of the Contract

3.1.3, **4.2**, 9.4, 9.5

### Advertisement or Invitation to Bid

1.1.1

### Aesthetic Effect

4.2.13

### Allowances

**3.8**

### Applications for Payment

4.2.5, 7.3.9, 9.2, **9.3**, 9.4, 9.5.1, 9.5.4, 9.6.3, 9.7, 9.10

### Approvals

2.1.1, 2.3.1, 2.5, 3.1.3, 3.10.2, 3.12.8, 3.12.9, 3.12.10.1, 4.2.7, 9.3.2, 13.4.1

### Arbitration

8.3.1, 15.3.2, **15.4**

## ARCHITECT

**4**

### Architect, Definition of

**4.1.1**

### Architect, Extent of Authority

2.5, 3.12.7, 4.1.2, 4.2, 5.2, 6.3, 7.1.2, 7.3.4, 7.4, 9.2, 9.3.1, 9.4, 9.5, 9.6.3, 9.8, 9.10.1, 9.10.3, 12.1, 12.2.1, 13.4.1, 13.4.2, 14.2.2, 14.2.4, 15.1.4, 15.2.1

### Architect, Limitations of Authority and Responsibility

2.1.1, 3.12.4, 3.12.8, 3.12.10, 4.1.2, 4.2.1, 4.2.2, 4.2.3, 4.2.6, 4.2.7, 4.2.10, 4.2.12, 4.2.13, 5.2.1, 7.4, 9.4.2, 9.5.4, 9.6.4, 15.1.4, 15.2

### Architect's Additional Services and Expenses

2.5, 12.2.1, 13.4.2, 13.4.3, 14.2.4

### Architect's Administration of the Contract

3.1.3, 3.7.4, 15.2, 9.4.1, 9.5

### Architect's Approvals

2.5, 3.1.3, 3.5, 3.10.2, 4.2.7

### Architect's Authority to Reject Work

3.5, 4.2.6, 12.1.2, 12.2.1

### Architect's Copyright

1.1.7, 1.5

### Architect's Decisions

3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 4.2.14, 6.3, 7.3.4, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4.1, 9.5, 9.8.4, 9.9.1, 13.4.2, 15.2

### Architect's Inspections

3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 13.4

### Architect's Instructions

3.2.4, 3.3.1, 4.2.6, 4.2.7, 13.4.2

### Architect's Interpretations

4.2.11, 4.2.12

### Architect's Project Representative

4.2.10

### Architect's Relationship with Contractor

1.1.2, 1.5, 2.3.3, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5, 3.7.4, 3.7.5, 3.9.2, 3.9.3, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.2, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3, 12, 13.3.2, 13.4, 15.2

### Architect's Relationship with Subcontractors

1.1.2, 4.2.3, 4.2.4, 4.2.6, 9.6.3, 9.6.4, 11.3

### Architect's Representations

9.4.2, 9.5.1, 9.10.1

### Architect's Site Visits

3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4

### Asbestos

10.3.1

### Attorneys' Fees

3.18.1, 9.6.8, 9.10.2, 10.3.3

### Award of Separate Contracts

6.1.1, 6.1.2

### Award of Subcontracts and Other Contracts for Portions of the Work

**5.2**

## Basic Definitions

**1.1**

### Bidding Requirements

1.1.1

### Binding Dispute Resolution

8.3.1, 9.7, 11.5, 13.1, 15.1.2, 15.1.3, 15.2.1, 15.2.5, 15.2.6.1, 15.3.1, 15.3.2, 15.3.3, 15.4.1

### Bonds, Lien

7.3.4.4, 9.6.8, 9.10.2, 9.10.3

### Bonds, Performance, and Payment

7.3.4.4, 9.6.7, 9.10.3, 11.1.2, 11.1.3, 11.5

### Building Information Models Use and Reliance

**1.8**

### Building Permit

3.7.1

### Capitalization

**1.3**

### Certificate of Substantial Completion

9.8.3, 9.8.4, 9.8.5

Init.

/

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No.2456323552 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

3

#### Certificates for Payment

4.2.1, 4.2.5, 4.2.9, 9.3.3, 9.4, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4, 15.1.4

Certificates of Inspection, Testing or Approval  
13.4.4

Certificates of Insurance  
9.10.2

#### Change Orders

1.1.1, 3.4.2, 3.7.4, 3.8.2.3, 3.11, 3.12.8, 4.2.8, 5.2.3, 7.1.2, 7.1.3, 7.2, 7.3.2, 7.3.7, 7.3.9, 7.3.10, 8.3.1, 9.3.1.1, 9.10.3, 10.3.2, 11.2, 11.5, 12.1.2

Change Orders, Definition of

7.2.1

#### CHANGES IN THE WORK

2.2.2, 3.11, 4.2.8, 7, 7.2.1, 7.3.1, 7.4, 8.3.1, 9.3.1.1, 11.5

Claims, Definition of

15.1.1

Claims, Notice of

1.6.2, 15.1.3

#### CLAIMS AND DISPUTES

3.2.4, 6.1.1, 6.3, 7.3.9, 9.3.3, 9.10.4, 10.3.3, 15, 15.4

Claims and Timely Assertion of Claims

15.4.1

#### Claims for Additional Cost

3.2.4, 3.3.1, 3.7.4, 7.3.9, 9.5.2, 10.2.5, 10.3.2, 15.1.5

#### Claims for Additional Time

3.2.4, 3.3.1, 3.7.4, 6.1.1, 8.3.2, 9.5.2, 10.3.2, 15.1.6

#### Concealed or Unknown Conditions, Claims for

3.7.4

Claims for Damages

3.2.4, 3.18, 8.3.3, 9.5.1, 9.6.7, 10.2.5, 10.3.3, 11.3, 11.3.2, 14.2.4, 15.1.7

Claims Subject to Arbitration

15.4.1

#### Cleaning Up

3.15, 6.3

Commencement of the Work, Conditions Relating to

2.2.1, 3.2.2, 3.4.1, 3.7.1, 3.10.1, 3.12.6, 5.2.1, 5.2.3, 6.2.2, 8.1.2, 8.2.2, 8.3.1, 11.1, 11.2, 15.1.5

Commencement of the Work, Definition of

8.1.2

#### Communications

3.9.1, 4.2.4

Completion, Conditions Relating to

3.4.1, 3.11, 3.15, 4.2.2, 4.2.9, 8.2, 9.4.2, 9.8, 9.9.1, 9.10, 12.2, 14.1.2, 15.1.2

#### COMPLETION, PAYMENTS AND

9

Completion, Substantial

3.10.1, 4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3, 12.2, 15.1.2

Compliance with Laws

2.3.2, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 10.2.2, 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14.1.1, 14.2.1.3, 15.2.8, 15.4.2, 15.4.3

#### Concealed or Unknown Conditions

3.7.4, 4.2.8, 8.3.1, 10.3

#### Conditions of the Contract

1.1.1, 6.1.1, 6.1.4

Consent, Written

3.4.2, 3.14.2, 4.1.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3, 13.2, 15.4.4.2

#### Consolidation or Joinder

15.4.4

#### CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

1.1.4, 6

Construction Change Directive, Definition of

7.3.1

#### Construction Change Directives

1.1.1, 3.4.2, 3.11, 3.12.8, 4.2.8, 7.1.1, 7.1.2, 7.1.3, 7.3, 9.3.1.1

Construction Schedules, Contractor's

3.10, 3.11, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2

#### Contingent Assignment of Subcontracts

5.4, 14.2.2.2

#### Continuing Contract Performance

15.1.4

Contract, Definition of

1.1.2

#### CONTRACT, TERMINATION OR SUSPENSION OF THE

5.4.1.1, 5.4.2, 11.5, 14

Contract Administration

3.1.3, 4, 9.4, 9.5

Contract Award and Execution, Conditions Relating to

3.7.1, 3.10, 5.2, 6.1

Contract Documents, Copies Furnished and Use of  
1.5.2, 2.3.6, 5.3

Contract Documents, Definition of

1.1.1

#### Contract Sum

2.2.2, 2.2.4, 3.7.4, 3.7.5, 3.8, 3.10.2, 5.2.3, 7.3, 7.4, 9.1, 9.2, 9.4.2, 9.5.1.4, 9.6.7, 9.7, 10.3.2, 11.5, 12.1.2, 12.3, 14.2.4, 14.3.2, 15.1.4.2, 15.1.5, 15.2.5

Contract Sum, Definition of

9.1

#### Contract Time

1.1.4, 2.2.1, 2.2.2, 3.7.4, 3.7.5, 3.10.2, 5.2.3, 6.1.5, 7.2.1.3, 7.3.1, 7.3.5, 7.3.6, 7, 7, 7.3.10, 7.4, 8.1.1, 8.2.1, 8.2.3, 8.3.1, 9.5.1, 9.7, 10.3.2, 12.1.1, 12.1.2, 14.3.2, 15.1.4.2, 15.1.6.1, 15.2.5

Contract Time, Definition of

8.1.1

#### CONTRACTOR

3

Contractor, Definition of

3.1, 6.1.2

#### Contractor's Construction and Submittal Schedules

3.10, 3.12.1, 3.12.2, 4.2.3, 6.1.3, 15.1.6.2

Init.

/

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No. 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

4

Contractor's Employees  
2.2.4, 3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3, 11.3, 14.1, 14.2.1.1

**Contractor's Liability Insurance**  
11.1

Contractor's Relationship with Separate Contractors and Owner's Forces  
3.12.5, 3.14.2, 4.2.4, 6, 11.3, 12.2.4

Contractor's Relationship with Subcontractors  
1.2.2, 2.2.4, 3.3.2, 3.18.1, 3.18.2, 4.2.4, 5, 9.6.2, 9.6.7, 9.10.2, 11.2, 11.3, 11.4

Contractor's Relationship with the Architect  
1.1.2, 1.5, 2.3.3, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5.1, 3.7.4, 3.10, 3.11, 3.12, 3.16, 3.18, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3, 12, 13.4, 15.1.3, 15.2.1

Contractor's Representations  
3.2.1, 3.2.2, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.8.2

Contractor's Responsibility for Those Performing the Work  
3.3.2, 3.18, 5.3, 6.1.3, 6.2, 9.5.1, 10.2.8

Contractor's Review of Contract Documents  
3.2

Contractor's Right to Stop the Work  
2.2.2, 9.7

Contractor's Right to Terminate the Contract  
14.1

Contractor's Submittals  
3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 9.2, 9.3, 9.8.2, 9.8.3, 9.9.1, 9.10.2, 9.10.3

Contractor's Superintendent  
3.9, 10.2.6

Contractor's Supervision and Construction Procedures  
1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.4, 7.3.6, 8.2, 10, 12, 14, 15.1.4

Coordination and Correlation  
1.2, 3.2.1, 3.3.1, 3.10, 3.12.6, 6.1.3, 6.2.1

Copies Furnished of Drawings and Specifications  
1.5, 2.3.6, 3.11

Copyrights  
1.5, 3.17

Correction of Work  
2.5, 3.7.3, 9.4.2, 9.8.2, 9.8.3, 9.9.1, 12.1.2, 12.2, 12.3, 15.1.3.1, 15.1.3.2, 15.2.1

**Correlation and Intent of the Contract Documents**  
1.2

**Cost, Definition of**  
7.3.4

**Costs**  
2.5, 3.2.4, 3.7.3, 3.8.2, 3.15.2, 5.4.2, 6.1.1, 6.2.3, 7.3.3.3, 7.3.4, 7.3.8, 7.3.9, 9.10.2, 10.3.2, 10.3.6, 11.2, 12.1.2, 12.2.1, 12.2.4, 13.4, 14

**Cutting and Patching**  
3.14, 6.2.5

**Damage to Construction of Owner or Separate Contractors**  
3.14.2, 6.2.4, 10.2.1.2, 10.2.5, 10.4, 12.2.4

**Damage to the Work**  
3.14.2, 9.9.1, 10.2.1.2, 10.2.5, 10.4, 12.2.4

**Damages, Claims for**  
3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.3.2, 11.3, 14.2.4, 15.1.7

**Damages for Delay**  
6.2.3, 8.3.3, 9.5.1.6, 9.7, 10.3.2, 14.3.2

**Date of Commencement of the Work, Definition of**  
8.1.2

**Date of Substantial Completion, Definition of**  
8.1.3

**Day, Definition of**  
8.1.4

**Decisions of the Architect**  
3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 6.3, 7.3.4, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4, 9.5.1, 9.8.4, 9.9.1, 13.4.2, 14.2.2, 14.2.4, 15.1, 15.2

**Decisions to Withhold Certification**  
9.4.1, 9.5, 9.7, 14.1.1.3

**Defective or Nonconforming Work, Acceptance, Rejection and Correction of**  
2.5, 3.5, 4.2.6, 6.2.3, 9.5.1, 9.5.3, 9.6.6, 9.8.2, 9.9.3, 9.10.4, 12.2.1

**Definitions**  
1.1, 2.1.1, 3.1.1, 3.5, 3.12.1, 3.12.2, 3.12.3, 4.1.1, 5.1, 6.1.2, 7.2.1, 7.3.1, 8.1, 9.1, 9.8.1, 15.1.1

**Delays and Extensions of Time**  
3.2, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, 8.3, 9.5.1, 9.7, 10.3.2, 10.4, 14.3.2, 15.1.6, 15.2.5

**Digital Data Use and Transmission**  
1.7

**Disputes**  
6.3, 7.3.9, 15.1, 15.2

**Documents and Samples at the Site**  
3.11

**Drawings, Definition of**  
1.1.5

**Drawings and Specifications, Use and Ownership of**  
3.11

**Effective Date of Insurance**  
8.2.2

**Emergencies**  
10.4, 14.1.1.2, 15.1.5

**Employees, Contractor's**  
3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3.3, 11.3, 14.1, 14.2.1.1

**Equipment, Labor, or Materials**  
1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2

**Execution and Progress of the Work**  
1.1.3, 1.2.1, 1.2.2, 2.3.4, 2.3.6, 3.1, 3.3.1, 3.4.1, 3.7.1, 3.10.1, 3.12, 3.14, 4.2, 6.2.2, 7.1.3, 7.3.6, 8.2, 9.5.1, 9.9.1, 10.2, 10.3, 12.1, 12.2, 14.2, 14.3.1, 15.1.4

Init.

/

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1968, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No. 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).

User Notes:

(913335626)

5

Extensions of Time  
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3, 7.4, 9.5.1, 9.7, 10.3.2,  
10.4, 14.3, 15.1.6, **15.2.5**

**Failure of Payment**  
9.5.1.3, **9.7**, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2

Faulty Work  
(See Defective or Nonconforming Work)

**Final Completion and Final Payment**  
4.2.1, 4.2.9, 9.8.2, **9.10**, 12.3, 14.2.4, 14.4.3

Financial Arrangements, Owner's  
2.2.1, 13.2.2, 14.1.1.4

**GENERAL PROVISIONS**

**I**

**Governing Law**  
**13.1**  
Guarantees (See Warranty)

**Hazardous Materials and Substances**  
**10.2.4, 10.3**

Identification of Subcontractors and Suppliers  
5.2.1

**Indemnification**  
3.17, **3.18**, 9.6.8, 9.10.2, 10.3.3, 11.3

**Information and Services Required of the Owner**  
2.1.2, 2.2, 2.3, 3.2.2, 3.12.10.1, 6.1.3, 6.1.4, 6.2.5,  
9.6.1, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4.1, 13.4.2,  
14.1.1.4, 14.1.4, 15.1.4

**Initial Decision**  
**15.2**

**Initial Decision Maker, Definition of**  
1.1.8

Initial Decision Maker, Decisions  
14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5

Initial Decision Maker, Extent of Authority  
14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5

**Injury or Damage to Person or Property**  
**10.2.8, 10.4**

Inspections  
3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3,  
9.9.2, 9.10.1, 12.2.1, 13.4

Instructions to Bidders  
1.1.1

Instructions to the Contractor  
3.2.4, 3.3.1, 3.8.1, 5.2.1, 7, 8.2.2, 12, 13.4.2

**Instruments of Service, Definition of**  
**1.1.7**

Insurance  
6.1.1, 7.3.4, 8.2.2, 9.3.2, 9.8.4, 9.9.1, 9.10.2, 10.2.5, **11**

Insurance, Notice of Cancellation or Expiration  
11.1.4, 11.2.3

**Insurance, Contractor's Liability**  
**11.1**  
Insurance, Effective Date of  
8.2.2, 14.4.2

**Insurance, Owner's Liability**  
**11.2**

**Insurance, Property**  
**10.2.5, 11.2, 11.4, 11.5**

Insurance, Stored Materials  
9.3.2

**INSURANCE AND BONDS**

**11**

Insurance Companies, Consent to Partial Occupancy  
9.9.1

Insured loss, Adjustment and Settlement of  
11.5

Intent of the Contract Documents  
1.2.1, 4.2.7, 4.2.12, 4.2.13

**Interest**  
**13.5**

**Interpretation**  
1.1.8, 1.2.3, **1.4**, 4.1.1, 5.1, 6.1.2, 15.1.1

Interpretations, Written  
4.2.11, 4.2.12

Judgment on Final Award  
15.4.2

**Labor and Materials, Equipment**  
1.1.3, 1.1.6, **3.4**, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1,  
5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1,  
10.2.4, 14.2.1.1, 14.2.1.2

Labor Disputes  
8.3.1

Laws and Regulations  
1.5, 2.3.2, 3.2.3, 3.2.4, 3.6, 3.7, 3.12.10, 3.13, 9.6.4,  
9.9.1, 10.2.2, 13.1, 13.3.1, 13.4.2, 13.5, 14, 15.2.8,  
15.4

Liens  
2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8

Limitations, Statutes of  
12.2.5, 15.1.2, 15.4.1.1

Limitations of Liability  
3.2.2, 3.5, 3.12.10, 3.12.10.1, 3.17, 3.18.1, 4.2.6,  
4.2.7, 6.2.2, 9.4.2, 9.6.4, 9.6.7, 9.6.8, 10.2.5, 10.3.3,  
11.3, 12.2.5, 13.3.1

Limitations of Time  
2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2.7,  
5.2, 5.3, 5.4.1, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3,  
9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14, 15,  
15.1.2, 15.1.3, 15.1.5

**Materials, Hazardous**  
**10.2.4, 10.3**

Materials, Labor, Equipment and  
1.1.3, 1.1.6, 3.4.1, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1,  
5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2,  
10.2.1.2, 10.2.4, 14.2.1.1, 14.2.1.2

Means, Methods, Techniques, Sequences and  
Procedures of Construction  
3.3.1, 3.12.10, 4.2.2, 4.2.7, 9.4.2

Mechanic's Lien  
2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8

**Mediation**  
8.3.1, 15.1.3.2, 15.2.1, 15.2.5, 15.2.6, **15.3**, 15.4.1,  
15.4.1.1

**Minor Changes in the Work**  
1.1.1, 3.4.2, 3.12.8, 4.2.8, 7.1, **7.4**

Init.

1

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No.2458323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.

User Notes:

(913335626)

6

## MISCELLANEOUS PROVISIONS

### 13

#### Modifications, Definition of

##### 1.1.1

#### Modifications to the Contract

1.1.1, 1.1.2, 2.5, 3.1.1, 4.1.2, 4.2.1, 5.2.3, 7, 8.3.1, 9.7, 10.3.2

#### Mutual Responsibility

##### 6.2

#### Nonconforming Work, Acceptance of

9.6.6, 9.9.3, 12.3

#### Nonconforming Work, Rejection and Correction of

2.4, 2.5, 3.5, 4.2.6, 6.2.4, 9.5.1, 9.8.2, 9.9.3, 9.10.4, 12.2

#### Notice

1.6, 1.6.1, 1.6.2, 2.1.2, 2.2.2, 2.2.3, 2.2.4, 2.5, 3.2.4, 3.3.1, 3.7.4, 3.7.5, 3.9.2, 3.12.9, 3.12.10, 5.2.1, 7.4, 8.2.2, 9.6.8, 9.7, 9.10.1, 10.2.8, 10.3.2, 11.5, 12.2.2.1, 13.4.1, 13.4.2, 14.1, 14.2.2, 14.4.2, 15.1.3, 15.1.5, 15.1.6, 15.4.1

#### Notice of Cancellation or Expiration of Insurance

11.1.4, 11.2.3

#### Notice of Claims

1.6.2, 2.1.2, 3.7.4, 9.6.8, 10.2.8, 15.1.3, 15.1.5, 15.1.6, 15.2.8, 15.3.2, 15.4.1

#### Notice of Testing and Inspections

13.4.1, 13.4.2

#### Observations, Contractor's

3.2, 3.7.4

#### Occupancy

2.3.1, 9.6.6, 9.8

#### Orders, Written

1.1.1, 2.4, 3.9.2, 7, 8.2.2, 11.5, 12.1, 12.2.2.1, 13.4.2, 14.3.1

## OWNER

### 2

#### Owner, Definition of

##### 2.1.1

#### Owner, Evidence of Financial Arrangements

2.2, 13.2.2, 14.1.1.4

#### Owner, Information and Services Required of the

2.1.2, 2.2, 2.3, 3.2.2, 3.12.10, 6.1.3, 6.1.4, 6.2.5, 9.3.2, 9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4.1, 13.4.2, 14.1.1.4, 14.1.4, 15.1.4

#### Owner's Authority

1.5, 2.1.1, 2.3.32.4, 2.5, 3.4.2, 3.8.1, 3.12.10, 3.14.2, 4.1.2, 4.2.4, 4.2.9, 5.2.1, 5.2.4, 5.4.1, 6.1, 6.3, 7.2.1, 7.3.1, 8.2.2, 8.3.1, 9.3.2, 9.5.1, 9.6.4, 9.9.1, 9.10.2, 10.3.2, 11.4, 11.5, 12.2.2, 12.3, 13.2.2, 14.3, 14.4, 15.2.7

#### Owner's Insurance

##### 11.2

#### Owner's Relationship with Subcontractors

1.1.2, 5.2, 5.3, 5.4, 9.6.4, 9.10.2, 14.2.2

#### Owner's Right to Carry Out the Work

2.5, 14.2.2

#### Owner's Right to Clean Up

##### 6.3

#### Owner's Right to Perform Construction and to Award Separate Contracts

##### 6.1

#### Owner's Right to Stop the Work

##### 2.4

#### Owner's Right to Suspend the Work

##### 14.3

#### Owner's Right to Terminate the Contract

14.2, 14.4

#### Ownership and Use of Drawings, Specifications and Other Instruments of Service

1.1.1, 1.1.6, 1.1.7, 1.5, 2.3.6, 3.2.2, 3.11, 3.17, 4.2.12, 5.3

#### Partial Occupancy or Use

9.6.6, 9.9

#### Patching, Cutting and

3.14, 6.2.5

#### Patents

3.17

#### Payment, Applications for

4.2.5, 7.3.9, 9.2, 9.3, 9.4, 9.5, 9.6.3, 9.7, 9.8.5, 9.10.1, 14.2.3, 14.2.4, 14.4.3

#### Payment, Certificates for

4.2.5, 4.2.9, 9.3.3, 9.4, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4

#### Payment, Failure of

9.5.1.3, 9.7, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2

#### Payment, Final

4.2.1, 4.2.9, 9.10, 12.3, 14.2.4, 14.4.3

#### Payment Bond, Performance Bond and

7.3.4.4, 9.6.7, 9.10.3, 11.1.2

#### Payments, Progress

9.3, 9.6, 9.8.5, 9.10.3, 14.2.3, 15.1.4

## PAYMENTS AND COMPLETION

### 9

#### Payments to Subcontractors

5.4.2, 9.5.1.3, 9.6.2, 9.6.3, 9.6.4, 9.6.7, 14.2.1.2

#### PCB

10.3.1

#### Performance Bond and Payment Bond

7.3.4.4, 9.6.7, 9.10.3, 11.1.2

#### Permits, Fees, Notices and Compliance with Laws

2.3.1, 3.7, 3.13, 7.3.4.4, 10.2.2

## PERSONS AND PROPERTY, PROTECTION OF

### 10

#### Polychlorinated Biphenyl

10.3.1

#### Product Data, Definition of

##### 3.12.2

#### Product Data and Samples, Shop Drawings

3.11, 3.12, 4.2.7

#### Progress and Completion

4.2.2, 8.2, 9.8, 9.9.1, 14.1.4, 15.1.4

#### Progress Payments

9.3, 9.6, 9.8.5, 9.10.3, 14.2.3, 15.1.4

Init.

/

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

7



**Project, Definition of**  
**1.1.4**  
 Project Representatives  
 4.2.10  
**Property Insurance**  
 10.2.5, 11.2  
**Proposal Requirements**  
 1.1.1  
**PROTECTION OF PERSONS AND PROPERTY**  
**10**  
 Regulations and Laws  
 1.5, 2.3.2, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 9.9.1,  
 10.2.2, 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14, 15.2.8, 15.4  
 Rejection of Work  
 4.2.6, 12.2.1  
 Releases and Waivers of Liens  
 9.3.1, 9.10.2  
 Representations  
 3.2.1, 3.5, 3.12.6, 8.2.1, 9.3.3, 9.4.2, 9.5.1, 9.10.1  
 Representatives  
 2.1.1, 3.1.1, 3.9, 4.1.1, 4.2.10, 13.2.1  
 Responsibility for Those Performing the Work  
 3.3.2, 3.18, 4.2.2, 4.2.3, 5.3, 6.1.3, 6.2, 6.3, 9.5.1, 10  
 Retainage  
 9.3.1, 9.6.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3  
**Review of Contract Documents and Field**  
**Conditions by Contractor**  
 3.2, 3.12.7, 6.1.3  
 Review of Contractor's Submittals by Owner and  
 Architect  
 3.10.1, 3.10.2, 3.11, 3.12, 4.2, 5.2, 6.1.3, 9.2, 9.8.2  
 Review of Shop Drawings, Product Data and Samples  
 by Contractor  
 3.12  
**Rights and Remedies**  
 1.1.2, 2.4, 2.5, 3.5, 3.7.4, 3.15.2, 4.2.6, 5.3, 5.4, 6.1,  
 6.3, 7.3.1, 8.3, 9.5.1, 9.7, 10.2.5, 10.3, 12.2.1, 12.2.2,  
 12.2.4, 13.3, 14, 15.4  
**Royalties, Patents and Copyrights**  
 3.17  
 Rules and Notices for Arbitration  
 15.4.1  
**Safety of Persons and Property**  
 10.2, 10.4  
**Safety Precautions and Programs**  
 3.3.1, 4.2.2, 4.2.7, 5.3, 10.1, 10.2, 10.4  
**Samples, Definition of**  
 3.12.3  
**Samples, Shop Drawings, Product Data and**  
 3.11, 3.12, 4.2.7  
**Samples at the Site, Documents and**  
 3.11  
**Schedule of Values**  
 9.2, 9.3.1  
 Schedules, Construction  
 3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2

Separate Contracts and Contractors  
 1.1.4, 3.12.5, 3.14.2, 4.2.4, 4.2.7, 6, 8.3.1, 12.1.2  
**Separate Contractors, Definition of**  
 6.1.1  
**Shop Drawings, Definition of**  
 3.12.1  
**Shop Drawings, Product Data and Samples**  
 3.11, 3.12, 4.2.7  
**Site, Use of**  
 3.13, 6.1.1, 6.2.1  
 Site Inspections  
 3.2.2, 3.3.3, 3.7.1, 3.7.4, 4.2, 9.9.2, 9.4.2, 9.10.1, 13.4  
 Site Visits, Architect's  
 3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4  
 Special Inspections and Testing  
 4.2.6, 12.2.1, 13.4  
**Specifications, Definition of**  
 1.1.6  
**Specifications**  
 1.1.1, 1.1.6, 1.2.2, 1.5, 3.12.10, 3.17, 4.2.14  
 Statute of Limitations  
 15.1.2, 15.4.1.1  
 Stopping the Work  
 2.2.2, 2.4, 9.7, 10.3, 14.1  
 Stored Materials  
 6.2.1, 9.3.2, 10.2.1.2, 10.2.4  
**Subcontractor, Definition of**  
 5.1.1  
**SUBCONTRACTORS**  
**5**  
 Subcontractors, Work by  
 1.2.2, 3.3.2, 3.12.1, 3.18, 4.2.3, 5.2.3, 5.3, 5.4, 9.3.1.2,  
 9.6.7  
**Subcontractual Relations**  
 5.3, 5.4, 9.3.1.2, 9.6, 9.10, 10.2.1, 14.1, 14.2.1  
 Submittals  
 3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 7.3.4, 9.2, 9.3, 9.8,  
 9.9.1, 9.10.2, 9.10.3  
 Submittal Schedule  
 3.10.2, 3.12.5, 4.2.7  
**Subrogation, Waivers of**  
 6.1.1, 11.3  
**Substances, Hazardous**  
 10.3  
**Substantial Completion**  
 4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3, 12.2,  
 15.1.2  
**Substantial Completion, Definition of**  
 9.8.1  
 Substitution of Subcontractors  
 5.2.3, 5.2.4  
 Substitution of Architect  
 2.3.3  
 Substitutions of Materials  
 3.4.2, 3.5, 7.3.8  
**Sub-subcontractor, Definition of**  
 5.1.2

Subsurface Conditions  
3.7.4  
**Successors and Assigns**  
**13.2**  
**Superintendent**  
3.9, 10.2.6  
**Supervision and Construction Procedures**  
1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3,  
7.3.4, 8.2, 8.3.1, 9.4.2, 10, 12, 14, 15.1.4  
Suppliers  
1.5, 3.12.1, 4.2.4, 4.2.6, 5.2.1, 9.3, 9.4.2, 9.5.4, 9.6,  
9.10.5, 14.2.1  
Surety  
5.4.1.2, 9.6.8, 9.8.5, 9.10.2, 9.10.3, 11.1.2, 14.2.2,  
15.2.7  
Surety, Consent of  
9.8.5, 9.10.2, 9.10.3  
Surveys  
1.1.7, 2.3.4  
**Suspension by the Owner for Convenience**  
**14.3**  
Suspension of the Work  
3.7.5, 5.4.2, 14.3  
Suspension or Termination of the Contract  
5.4.1.1, 14  
**Taxes**  
3.6, 3.8.2.1, 7.3.4.4  
**Termination by the Contractor**  
14.1, 15.1.7  
**Termination by the Owner for Cause**  
5.4.1.1, 14.2, 15.1.7  
**Termination by the Owner for Convenience**  
**14.4**  
Termination of the Architect  
2.3.3  
Termination of the Contractor Employment  
14.2.2

## **TERMINATION OR SUSPENSION OF THE CONTRACT**

### **14**

#### **Tests and Inspections**

3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3,  
9.9.2, 9.10.1, 10.3.2, 12.2.1, 13.4

#### **TIME**

### **8**

#### **Time, Delays and Extensions of**

3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, 8.3, 9.5.1, 9.7,  
10.3.2, 10.4, 14.3.2, 15.1.6, 15.2.5

#### **Time Limits**

2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2,  
5.2, 5.3, 5.4, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1,  
9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14, 15.1.2,  
15.1.3, 15.4

#### **Time Limits on Claims**

3.7.4, 10.2.8, 15.1.2, 15.1.3

#### **Title to Work**

9.3.2, 9.3.3

## **UNCOVERING AND CORRECTION OF WORK**

### **12**

#### **Uncovering of Work**

### **12.1**

#### **Unforeseen Conditions, Concealed or Unknown**

3.7.4, 8.3.1, 10.3

#### **Unit Prices**

7.3.3.2, 9.1.2

#### **Use of Documents**

1.1.1, 1.5, 2.3.6, 3.12.6, 5.3

#### **Use of Site**

3.13, 6.1.1, 6.2.1

#### **Values, Schedule of**

9.2, 9.3.1

#### **Waiver of Claims by the Architect**

13.3.2

#### **Waiver of Claims by the Contractor**

9.10.5, 13.3.2, 15.1.7

#### **Waiver of Claims by the Owner**

9.9.3, 9.10.3, 9.10.4, 12.2.2.1, 13.3.2, 14.2.4, 15.1.7

#### **Waiver of Consequential Damages**

14.2.4, 15.1.7

#### **Waiver of Liens**

9.3, 9.10.2, 9.10.4

#### **Waivers of Subrogation**

6.1.1, 11.3

#### **Warranty**

3.5, 4.2.9, 9.3.3, 9.8.4, 9.9.1, 9.10.2, 9.10.4, 12.2.2,  
15.1.2

#### **Weather Delays**

8.3, 15.1.6.2

#### **Work, Definition of**

1.1.3

#### **Written Consent**

1.5.2, 3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.10.3,  
13.2, 13.3.2, 15.4.4.2

#### **Written Interpretations**

4.2.11, 4.2.12

#### **Written Orders**

1.1.1, 2.4, 3.9, 7, 8.2.2, 12.1, 12.2, 13.4.2, 14.3.1

Init.

1

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No.2456323652 which expires on 03/18/2022. It is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).

User Notes:

(913335626)

9

## 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.

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No. 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

10

§ 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 forth in AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

Init.

AIA Document A201® - 2017, Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No.2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

11

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.

§ 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.

Init.

1

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No. 2456323652 which expires on 03/18/2022. It is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

12

§ 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.

#### § 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.

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No. 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

13

§ 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. **The Construction Manager is responsible to ensure all construction is in compliance with Drawings and Specifications.**

§ 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.

§ 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.

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No. 2456323552 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

14



§ 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 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.

**§ 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.

§ 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.

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1916, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes:

(913335626)

17

§ 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.

### § 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.

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No. 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

18

### § 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, willful or malicious 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 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.

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201" and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No. 2456323652 which expires on 03/18/2022. It is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

19

§ 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.

§ 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.

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No.2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

20

## 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 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.

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No. 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

21



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 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.

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

22

§ 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;
- .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:

Init.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No.2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).

User Notes:

(913335626)

23



- 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 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.

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No. 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

24

§ 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.

### § 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.

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No.2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes:

(913335626)

25

§ 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 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;

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No. 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

26

- .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.

§ 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.

Init.

AIA Document A201® - 2017, Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No.2456323852 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

27

#### § 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 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.

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No.2456323852 which expires on 03/18/2022. It is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

28

§ 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;
- .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

Init.

1

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335826)

29



- .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.

#### § 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

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No. 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

30

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, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance **which was present prior to commencement of Work** 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, **willful or malicious conduct** 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 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 (20) 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 (20) 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.

*(Paragraphs deleted)*

#### **§ 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

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No.2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

32

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.

### **§ 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

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

33

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 **Wisconsin**. 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 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.

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes:

(913335626)

34

§ 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.

### 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.

§ 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 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:

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No. 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

35

- .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, 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;

### 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 including Wis. Stat. Chapter 893, 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.

**§ 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.

*(Paragraphs deleted)*

**§ 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 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 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 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

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No. 2456323652 which expires on 03/18/2022. It is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).

User Notes:

(913335626)

37



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.

*(Paragraphs deleted)*

§ 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.

n shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association with three arbitrators; each party shall choose one arbitrator and the two chosen arbitrators mutually agree on a third. The Arbitration shall be conducted Janesville, Rock County Wisconsin. 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.

*(Paragraphs deleted)*

§ 15.4.1.1 A demand for arbitration 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.

Init.

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by the American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

38

§ 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 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.

Init.

/

AIA Document A201® - 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No.2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

39



## Additions and Deletions Report for

AIA® Document A201® – 2017

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 12:25:57 ET on 02/25/2022.

### PAGE 1

Rock County Jail and Law Enforcement Services Expansion  
200 East U.W. Highway 14  
Janesville, WI 53545

...

Rock County Wisconsin  
51 S Main St  
Janesville WI 53546

...

Venture Architects  
212 North 25<sup>th</sup> Street  
Milwaukee WI 53233  
PAGE 14

§ 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. **The Construction Manager is responsible to ensure all construction is in compliance with Drawings and Specifications.**

### PAGE 19

§ 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, willful or malicious 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.

### PAGE 31

§ 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 **which was present prior to commencement of Work** 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

Additions and Deletions Report for AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No.2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

1

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 or negligence, willful or malicious conduct of the party seeking indemnity.

...

**§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three ~~(3)~~ **(20)** 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.

PAGE 32

**§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three ~~(3)~~ **(20)** 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 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.

PAGE 34

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. Wisconsin. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

PAGE 35

Additions and Deletions Report for AIA Document A201® - 2017, Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No 2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

§ 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, executed.~~

...

- 3 ~~repeatedly~~ disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

PAGE 36

§ 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.~~

...

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~~, law including Wis. Stat. Chapter 893, 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.

PAGE 37

#### ~~§ 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.~~

§ 15.2.1 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.~~

PAGE 38

~~§ 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.~~

Additions and Deletions Report for AIA Document A201® - 2017, Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was produced by AIA software at 12:25:57 ET on 02/25/2022 under Order No.2456323652 which expires on 03/18/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail [copyright@aia.org](mailto:copyright@aia.org).  
User Notes: (913335626)

3

...  
n shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association with three arbitrators; each party shall choose one arbitrator and the two chosen arbitrators mutually agree on a third. The Arbitration shall be conducted Janesville, Rock County Wisconsin. 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.

#### **§ 15.3 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.

**§ 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.  
PAGE 39

§ 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.

**B. AIA Document A133-2019**

The AIA133-2019 is available for viewing at the J. P. Cullen & Sons, Inc. office upon written request with twenty-four (24) hour advance notice.

**END OF SECTION**

**SECTION 00 73 05**  
**SPECIAL CONDITIONS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. These Supplementary Conditions are hereby made a part of every section in this specification and shall be binding upon every Contractor, Sub Contractor and material supplier.
- B. SUMMARY
  - 1. Index:
    - a. Description
    - b. Commencement and Completion
    - c. Cooperation
    - d. Priority
    - e. Cooperation with Public Service Companies
    - f. Measurements
    - g. Substitute Materials
    - h. Design Clarifications
    - i. Warranty
    - j. Asbestos
    - k. Non Discrimination in Employment

**1.2 COMMENCEMENT AND COMPLETION**

- A. Successful bidder must agree to commence work within five (5) days of date specified in a written Notice to Proceed and fully complete Project on date indicated in this Manual.
- B. Should it be found impossible to complete Work on or before time specified for completion, a written request may be submitted for extension of time setting forth reasons believed to justify granting of such request. If Owner finds that Work was delayed because of conditions beyond control of Contractor, or that quantities of work done or to be done are in excess of estimated quantities by an amount sufficient to warrant additional time, Owner may grant an extension of time for completion as appears reasonable and proper. Extended time for completion shall then be considered as in full force and effect, as if it were original time for completion.
- C. Permitting Work or any part of it to continue after time fixed for its completion, or after date to which time for completion may have been extended, shall in no way operate as a waiver on part of Owner or any of Owner's rights under Contract.

**1.3 COOPERATION**

- A. General Contractor and all Sub Contractors shall coordinate their work with all adjacent work and shall cooperate with all other trades so as to facilitate general progress of Work. Each trade shall afford all other trades every reasonable opportunity for installation of their work and storage of their material.
- B. Inasmuch as building completion within time limit is dependent upon cooperation of those engaged therein, it is required that each Contractor lay out and install their work at a time and in such a manner not to delay or interfere with progress of other Contractors' work.
- C. If any Contractor's work is delayed due to lack of storage facilities or non cooperation of other Contractors, Contractor shall immediately notify Architect in writing who will then notify Contractors involved of their obligation under this Article.

#### **1.4 PRIORITY**

- A. In case of close quarters for installation of piping systems and in absence of instructions to contrary, following order of priority shall be followed:
  - 1. Lighting fixtures;
  - 2. Sheet metal ductwork
  - 3. Plumbing work;
  - 4. Mechanical work, including heating and air conditioning
  - 5. Piping
  - 6. Electrical work
  - 7. Control systems
- B. The above list, in descending order, is the precedence assigned the work items for space priority. Recessed light fixtures and space for their installation has first priority, sheet metal ductwork second priority, etc

#### **1.5 COOPERATION WITH PUBLIC SERVICE COMPANIES**

- A. When performing Work near public service lines, cables or pipes, Contractor shall notify companies owning same so that they may cooperate to avoid damage or accidents.

#### **1.6 MEASUREMENT**

- A. Before ordering materials or doing any work, each Contractor shall verify all measurements at building and shall be responsible for their correctness. No extra compensation will be allowed because of difference between actual dimensions and those indicated on Drawings. Any discovered difference which may be found shall be reported to Architect for consideration before proceeding with Work.

#### **1.7 SUBSTITUTE MATERIALS**

- A. When substitutions are bid, they shall be identified by manufacturer, stock number, and other descriptive information to establish equivalencies. Substitutions shall be requested prior to the question cut-off date.

#### **1.8 DESIGN CLARIFICATIONS**

- A. The Drawings and Specifications are representative and typical of the quality and type of construction for the Project.
- B. During the bidding process the Contractor shall assume the same quality and level of detail in areas of the building not specifically shown or detailed.
- C. The Contractor shall provide a complete and functional building and complete and functional building systems whether or not fully specified or detailed. If questions arise during construction relating to items not detailed on the architectural or engineering drawings, the Contractor shall submit a "Design Clarifications" document (drawing or statement) illustrating what the Contractor had anticipated in their bid for this particular detail. The "Design Clarification" shall be submitted to the Architect for review.

#### **1.9 WARRANTY (See Article 3.5 of General Conditions)**

- A. Contractor shall and hereby does warrant all work and materials called for in this specification, including all work performed by Sub Contractors, for a period of one (1) year from date of final completion of project.



- B. In case of work performed by Sub Contractors and where guarantees are required, secure warranties from said Sub Contractors addressed to and in favor of Owner. Deliver copies of same to Architect upon completion of work.
- C. Delivery of said warranties shall not relieve Contractor from any obligation assumed under any other provisions of Contract.
- D. Nothing herein intends or implies that warranty shall apply to work which has been abused or neglected by Owner or Owners successor in interest.

**1.10 ASBESTOS**

- A. If, during the construction of this project, work involving friable asbestos is suspected or encountered, the Owner or the Owner's representative shall be notified immediately and the Owner, with its own forces or by separate contract, shall be responsible for complete investigation, removal and disposition of the friable asbestos hazard in accordance with applicable laws and regulations.

**1.11 NON-DISCRIMINATION IN EMPLOYMENT**

- A. In connection with the performance of work under this Contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of race, religion, color or national origin. The aforesaid provision shall include, but not be limited to, the following: Employment, upgrading, demotion or transfer; recruitment or recruitment advertising; lay off or termination; rates of pay or other forms of compensation; and selection for training including apprenticeship. The Contractor agrees to post in conspicuous places, available for employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of the non discrimination clause.

**END OF SECTION**

**THIS PAGE INTENTIONALLY BLANK**

SECTION 00 83 00  
EQUAL EMPLOYMENT OPPORTUNITY PROGRAM

- 1.1 During performance of the work of the contract, the subcontractor will be required to follow an equal employment opportunity program complying with the current rules, regulations, and relevant orders of the Secretary of Labor.
- 1.2 The subcontractor's equal employment opportunity program should be based on the following stipulations, except as otherwise approved in advance by the appropriate governing agency.
  - A. There shall be no discrimination against any employee or applicant for employment because of race, creed, color, sex, age, religion, disability, or national origin. Affirmative action will be taken to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, sex, age, religion, disability, or national origin. Such action shall include, but not be limited to, the following:
    - (1) Employment, upgrading, demotion, or transfer
    - (2) Recruitment or recruitment advertising
    - (3) Layoffs or terminations
    - (4) Rates of pay or other forms of compensation
    - (5) Selection for training, including apprenticeship
  - B. Notices shall be posted in conspicuous places, available to employees and applicants for employment, setting forth the provisions of this nondiscrimination clause.
  - C. All solicitations or advertisement for employees shall state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex, age, religion, disability, or national origin.
  - D. Subcontractors shall furnish all information and reports required by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto as required by the Construction Manager, for purposes of investigation to ascertain compliance with such rules, regulations, and orders. The subcontractors shall furnish, as requested, copies of their certified payrolls indicating ethnic group of each employee.
  - E. In the event of subcontractors' noncompliance with the nondiscrimination clauses of their contracts, or with any of such rules, regulations, or orders, their contracts may be canceled, terminated, or suspended in whole or in part, and they may be declared ineligible for further contracts on governmentally assisted construction work. Other sanctions may be imposed and remedies invoked as provided by the rules, regulations, or order of the Secretary of Labor, or as otherwise provided by law.
  - F. The subcontractor shall include the provisions of paragraphs "A" through "E" in every subcontract or purchase order so that such provisions will be binding upon each subcontractor or vendor.

1.3 Other programs in satisfactory use may be substituted in lieu of the basic program delineated above, subject to the approval of all governmental agencies having jurisdiction.

END OF SECTION

SECTION 01 01 50  
USE OF THE PREMISES

1.1 Description

- A. Work included: This section applies to situations in which the subcontractor or his/her representatives including, but not limited to, suppliers, subcontractors, employees, and field engineers, enter the Owner's property.
- B. Related work:
  - 1. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Divisions 0 and I of these Specifications.

1.2 Site

- A. Truck and equipment access: Must be coordinated with Superintendent.
- B. Parking: Must be coordinated with Superintendent.
- C. Subcontractor's vehicles: Must be coordinated with Superintendent.
- D. Site: Must be coordinated with Superintendent.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

## SECTION 01 04 00 COORDINATION

### 1.1 Site and Construction Conditions

- A. Information pertaining to preliminary investigations appears on drawings. While such data has been collected with reasonable care, there is no expressed or implied guarantee that conditions so indicated are entirely representative of those actually existing or that unanticipated developments may not occur. Subcontractor must put his own interpretation on results of such investigation and shall satisfy himself as to materials to excavated and materials upon which fill or other work may be placed. Where underground services, utilities, structure, etc. are located on drawings or given at site, they are based on available records, but not guaranteed to complete or correct. They are merely given to assist each subcontractor in determining location.
- B. The Owner and their representatives reserve the right to enter the property or site on which the work herein described is to be constructed or installed to perform work as the Owner may desire. Such collateral work will be constructed or installed with as little hindrance or interference as possible and the subcontractors hereby agree not to interfere with, or prevent the performance of such collateral work authorized by the Owner or to claim any extra compensation or damages by delay or hindrance which may be caused by such construction or installation of such collateral work.
- C. Prior to starting construction, the Construction Manager, Architect, or his representative shall check existing curb, city walk, and access at site. Except for work shown to be repaired or replaced as part of contract price, any other work such as curbs, drives, sidewalk to be replaced at this check will be coordinated with the Construction Manager. Other than the above, found damage after this check will be repaired or replaced in accordance with Special Conditions Item E.
- D. Starting of work by the subcontractor implies his acceptance of the work by others. Removal and replacement of work applied to defective surfaces in order to correct defects shall be done at the expense of the Subcontractor who applied work to defective surfaces. The Subcontractor shall notify the Construction Manager and the Architect in writing of discrepancies between existing work and contract documents and defects in surfaces that are to receive this work.
- E. Each subcontractor shall give due notice and proper information to other subcontractors of any special provisions necessary for the placing and setting of his work coming in contact with work of other subcontractors. If the subcontractor fails to give proper notice, they shall be held responsible and shall pay for any and all alterations and repairs necessitated by such neglect.
- F. Subcontractors shall perform work in proper sequence and in relation to that of other subcontractors and as coordinated by the Construction Manager. Mechanical and electrical subcontractors shall fit their work into structure as job conditions may demand. Final decisions as to right-of-way and run of pipes, ducts, etc., shall be made by the Construction Manager at regularly prearranged

meetings with responsible representatives of Architect and subcontractors. Any costs caused by defective or ill-timed work shall be borne by the party responsible for that work.

- G. Each Subcontractor shall obtain complete data at the site and inspect surfaces and areas that are to receive his work before proceeding with his work; shall be solely responsible for accuracy of measurement and laying out of work; shall make good on errors or defects due to faulty measurement taken, information obtained, layout or due to failure to report deficiencies.
- H. Each subcontractor shall be responsible for any required street cleaning made necessary by their respective firms or their suppliers.

## 1.2 Jurisdictional Disputes

- A. The Construction Manager will endeavor to specify the work under the proper headings so that it will relate to the separate construction trades in accordance with accepted jurisdictional rulings. However, the Construction Manager shall not be responsible for any differences which may arise due to disputes between the trades in this respect. It shall be the responsibility of the subcontractor, working with the trades, to determine which of the trades is to perform any particular part of the work, and the inclusion of any branch under any particular heading in this specification is not to be construed as a directive in any way.

## 1.3 No Interruption of Occupancy

- A. All work requiring interruption of occupancy shall be approved by and coordinated with the Construction Manager and the Owner.

## 1.4 Disruption of Existing Services

- A. All work relating to the disruption of existing services shall be coordinated with the Construction Manager and the Owner.
- B. If the Owner should require that a portion of the Work be performed outside of normal working hours, reimbursement shall be made for premium time expenses only, without markup.

## 1.5 Communications

- A. All subcontractors shall forward all communications to the Construction Manager. Direction given directly to the subcontractor by the Architect and/or Owner will not be considered binding.

## 1.6 Coordination Drawings

- A. Subcontractors responsible for the items of work located in or above ceilings shall participate in preparation of coordination drawings if required by the Construction Manager



The following, in descending order, is the precedence assigned the work items for space priority. An exception to the precedence listing would be the gravity flow requirements for plumbing, waste and roof drainage.

1. Recessed light fixtures
  2. Ductwork and appurtenances
  3. Plumbing waste and roof drainage
  4. Fire protection (sprinkler system)
  5. HVAC piping
  6. Plumbing vent, water and medical gas piping
  7. Electrical conduit
- B. After award of contracts and prior to start of construction, the Construction Manager will schedule a meeting with the subcontractors responsible for the work items listed above. The purpose of the meeting is to introduce the coordination program and to determine its implementation in relation to the progress schedule.
- C. Prior to coordination meeting, the HVAC subcontractor will provide to the Construction Manager drawings showing column center lines, interior partition locations, and ceiling heights. The HVAC subcontractor, with reference and consideration to the structural mechanical, electrical, fire protection, plumbing and reflected ceiling plans, will draw, to scale, his proposed installation showing duct sizes, equipment layouts, and dimensions from column lines and from finished floors to bottom of ducts. Ductwork will be maintained as tight as possible to the underside of floor slabs and/or beams. In congested areas, the HVAC subcontractor will, in addition, prepare drawings in section view. During this phase of the program, it will be the electrical subcontractor's responsibility to furnish the HVAC subcontractor with recessed lighting installation and clearance requirements. This information will be outlined on the drawings by the HVAC subcontractor.
- D. The ductwork layouts will be produced in sequence as mandated by the project schedule. The earliest area indicated in the schedule will receive the first effort, etc.
- E. When the ductwork drawings for the earliest scheduled area have been completed (time limitation as determined at the initial coordination meeting), the HVAC subcontractor will provide the Construction Manager with one (1) set of sepias for each participant in the effort. the Construction Manager will distribute the sepias to the participating subcontractors for their use in drawing thereon the major components for their proposed installations using the general scheme shown on the contract drawings as a guide.

The major components to be indicated include (but are not limited to):

1. Roof drain leaders
2. Large (3 inches and over) waste piping

3. Sprinkler mains
4. Heating mains
5. Cooling mains
6. Conveying systems
7. Significant conduit runs
8. Cable trays
9. Duct mains and branches

Information delineated will be distance from column center lines, pipe/equipment size and distance from finished floor to bottom of pipe/equipment.

- F. Within a period not to exceed one (1) week after distribution of the drawings, the Construction Manager will schedule a meeting with the participating subcontractors at which time, the drawing will be overlaid to identify areas of conflict. All parties will then cooperate in resolving the conflicts. Records of the agreements will be entered on the HVAC subcontractor's drawings, acknowledged by all participants by signature in a space provided for this purpose, and two (2) blue line copies distributed to all involved parties. All drawing reproduction costs will be borne by the HVAC subcontractor. The above drawing, review and coordination process will be repeated until all areas on the project have been coordinated as determined by the Construction Manager.
- G. In the event a subcontractor fails to cooperate in the coordination program, he will be held responsible for all costs incurred for adjustments to the work of others made necessary to accommodate the uncooperative subcontractor's installations.
- H. When a change order request is issued, the affected subcontractors shall review the coordination drawings and bring to the attention of the Construction Manager any revisions necessary to the work of others not directly affected by the change order.

END OF SECTION

## SECTION 01 04 50 CUTTING AND PATCHING

### 1.1 Coordination

- A. Each subcontractor shall be responsible for the cutting and patching of all holes and openings through walls and partitions, and all holes and openings through floors, ceilings, and roofs necessary for the installation of their work. If the location for a hole or opening is through a new or existing joist, beam or column, the subcontractor shall notify the Construction Manager who, after consultation with the Architect, will instruct the subcontractor how to proceed.
- B. In the event of a conflict, precedence or priority in installing piping, duct work, conduit, etc., in close quarters shall be determined by the Construction Manager. Subcontractor shall confer and cooperate with other trades providing work in confined areas.
- C. Any costs caused by ill-timed work shall be assigned by the Construction Manager to the responsible subcontractor.

### 1.2 New or Existing Construction

- A. Each subcontractor shall furnish and install all sleeves, anchors, inserts, supports, caulking, fire safing and insulation required for their openings. Where lintels are required for openings but not shown on the drawings, they shall be provided by the subcontractor requiring the opening for their work.
- B. All cutting shall be carefully done to minimize repair.
- C. Core drill all holes six (6) inches in diameter or smaller, except for holes in post-tensioned slabs. The use of electrical or pneumatic hammers is not permitted unless approved by the Construction Manager. For larger openings, saw-cut outline and break out, exercise care to prevent spalling on reverse sides. Coring machines shall have warning devices indicating contact with steel or other metals. Subcontractor shall secure any local permits or approvals required for the use of cutting or burning torches.
- D. Patching of openings shall include both rough (substrate) and finish surfaces (where already existing). All patching shall be done in a neat and workman-like manner and shall match adjacent surfaces.
- E. Any sprayed fireproofing damaged by cutting or patching shall be repaired or replaced by the responsible subcontractor.
- F. The temporary removal and replacement of ceilings not scheduled for replacement shall be the responsibility of the Subcontractor requiring access.
- G. All removals, relocations, and restorations required for the execution of a subcontractor's work shall be the responsibility of that subcontractor, unless noted otherwise in a specific section of the specifications and/or on the drawings.

- H. Painting of patched areas shall not be required unless noted otherwise in the Room Finish Schedule or elsewhere in the contract documents.
- I. The subcontractor shall be responsible for the cutting and patching of all required beam pockets and slab recesses, for the installation of their work.
- J. Post-tensioned slabs - Written approval must be obtained from the Construction Manager prior to core drilling of post-tensioned slabs. Hole locations are to be laid out, indicating size of hole to be cored, distance from column center lines to center of hole.

END OF SECTION

SECTION 01 05 00  
FIELD ENGINEERING

1.1 Description

- A. Work included: Provide such field engineering services as are required for proper completion of the work including, but not necessarily limited to:

1. Establishing and maintaining lines and levels.
2. Similar items provided by the subcontractor as part of his means and methods of construction.

1.2 the Construction Manager Responsibilities

- A. Provide datum bench on each floor for use of all subcontractors.
- B. Establish periodic grid lines.

1.3 Subcontractor Responsibilities

- A. Each subcontractor, as it applies to his contract, shall verify grades, lines, levels, locations, and dimensions as shown on drawings and report any errors or inconsistencies to the Construction Manager before commencing work.
- B. Starting of work by subcontractor shall imply his acceptance. Each subcontractor shall be responsible for field measuring existing conditions prior to fabrication of materials and/or equipment, which fit into restrictive spaces.
- C. Each subcontractor will be responsible for his own layout.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

## **SECTION 01 11 00**

### **SUMMARY OF WORK**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Section includes:
  - 1. Project description
  - 2. Work sequence
  - 3. Contractor's use of site and premises
  - 4. Owner furnished products

##### **1.2 PROJECT DESCRIPTION**

- A. Work of this Project (LES/JAIL) is described as additions and renovations to the existing Rock County Jail:
  - 1. General construction: The Rock County Law Enforcement Services and Jail will be demolishing an existing four-story structure and replacing it with more efficient single-story additions. The existing structure to be demolished houses some jail function and some law enforcement services function. The addition for Law Enforcement Services will be constructed on the west end of the existing structure and the jail addition will be to the east. Because all functions need to be remain operational during construction, the additions must be built and occupied before the existing four story building can be demolished.
- B. J.P. Cullen and Sons, Inc. is the Construction Manager for the project.

##### **1.3 WORK SEQUENCE**

- A. Coordinate and relay construction schedule and operations updates to the Owner and Construction Manager.

##### **1.4 CONTRACTOR'S USE OF SITE AND PREMISES**

- A. Limit use of site and premises to allow for:
  - 1. Work by separate contractors.
  - 2. Work by Owner.
  - 3. Owner occupancy.
  - 4. Use of site and adjacent premises by the public.
- B. Move any stored products under Contractor's control that interfere with the operations of the Owner or separate contractors.
- C. Assume full responsibility for protection and safekeeping of products under this Contract stored on site.
- D. Obtain and pay for use of any additional storage or work areas needed for operations.
- E. Coordinate use of site and premises with the Owner:
  - 1. Employee parking: In designated areas.
  - 2. Access to site and premises: As directed by the Owner.
  - 3. Storage and staging areas: Established at the pre-construction meeting.
  - 4. Transport materials and equipment to and from construction area along routes approved by Owner.

- F. Confine operations to construction area unless otherwise approved by Owner.
- G. Prohibit smoking within interior spaces.

## **PART 2 - PRODUCTS**

Not Used

## **PART 3 - EXECUTION**

Not used

**END OF SECTION**



SECTION 01 15 20  
APPLICATION FOR PAYMENT

1.1 Description

- A. Work included: Comply with procedures described in this section when applying for progress payments and final payment under the contract.

1.2 Formal Submittal

- A. If the Construction Manager does not receive a Schedule of Values from the subcontractor within fifteen (15) days after notification, payment may not be made.
- B. The subcontractor Labor Amount shall include all estimated on-site installation costs (including labor, applicable taxes, insurance, fringe benefits, and overhead/profit). Amount shall include all estimated materials and manufactured equipment costs (including delivery costs, taxes, insurance, and overhead/profit). Tools and erection equipment shall be included under the materials/equipment amount and will equal the contract amount.
- C. In each work category, an amount of money shall be included in the Schedule of Values breakdown for warranties and manuals. Submission of these warranties and manuals is a requirement of the contract documents and payment in the assigned amounts identified in the Schedule of Values will not be made to the subcontractor until said warranties and manuals have been received and approved by the Owner, Architect, and the Construction Manager.
- D. The form of Application for Payment shall be a notarized Application for Payment form, supported by AIA documents G703, Continuation Sheet. the Construction Manager shall pay 90% of the amount due the subcontractor on all progress payments.
- E. On or before the 20th day of each calendar month, the subcontractor must submit to the Construction Manager an application for payment. The payment application shall be on typewritten Application for Payment forms that have had the schedule of values previously approved by the Construction Manager. Submit the original application for payment to the Construction Manager.
- F. Each subcontractor shall post the Construction Manager subcontract number in the upper right hand corner of the application for payment forms, lien waiver, invoices, etc. If the Construction Manager subcontract numbers are not included on the above documents, the subcontractor's application for payment may be rejected.
- G. Request for payment involving materials stored off the site will be considered conditional upon the submission of bills of sale, lien waivers, and proof of suitable, bonded storage by the subcontractor. A certificate of insurance for the material listing the Owner and the Construction Manager as additionally insured shall also be submitted with the request for payment.
- H. The material stored off site shall be available for inspection by the Construction

Manager and the Owner on a monthly basis.

- I. Each subcontractor shall pay each of its subcontractors, including material suppliers, for satisfactory performance under its subcontract not later than seven (7) days from receipt of payment out of such amounts as are paid to the subcontractor under this contract.
- J. Reference the following Pay Applications.

# **APPLICATION FOR PAYMENT**

## **IMPORTANT BILLING INFORMATION**

Please forward this information to your billing department.

### **BILLING DEPARTMENT**

Each invoice (draw) must be accompanied by a fully completed (all three pages) Application for Payment form (copy attached). Scanned copies are accepted, but the notary seal/stamp must be visible.

Each change order must be listed on page 3, individually, as issued. Include a brief description and our R.Q. number for each item.

Applications for Payment must be received by the 23<sup>rd</sup> of each month. Please email to Accounts Payable (payapps@jpcullen.com).

Following these procedures will ensure timely processing of your applications.

Thank you for your cooperation in this matter.

**\*\*\*\*Please make extra copies, even if you do not  
anticipate additional draws.  
Our intent is to NOT recreate these forms.\*\*\*\***

## APPLICATION FOR PAYMENT

1

TO: J. P. Cullen & Sons, Inc.  
 P.O. Box 5957  
 Janesville, WI 53547-5957  
 P: 608-754-6601  
 E: payapps@jpcullen.com

FOR: \_\_\_\_\_  
 (Project Name)

Contract/P.O.#: # \_\_\_\_\_ /S# \_\_\_\_\_

FROM: \_\_\_\_\_  
 (Subcontractor Name)

Our Application for Payment # \_\_\_\_\_

PH: \_\_\_\_\_

Application Date: \_\_\_\_\_

EMAIL: \_\_\_\_\_

Application Amount: \$ \_\_\_\_\_

INVOICE # \_\_\_\_\_

For Period Ending: \_\_\_\_\_

We apply for payment under the contract as follows:

Original Contract Sum:

(A) \_\_\_\_\_

Net Change by Change Order:

(B) \_\_\_\_\_

Contract Sum to Date:

(A+B) \_\_\_\_\_

Work Completed, in place: **(cumulative)**

(1) \_\_\_\_\_

Material Suitably Stored (if any)

(2) \_\_\_\_\_

Gross Amount Due

(3)= (1+2) \_\_\_\_\_

Less: \_\_\_\_\_ Retainage

(4)= (3) x retainage% \_\_\_\_\_

Amount Due to Date:

(5)= (3-4) \_\_\_\_\_

Less Previous Applications: **(net of retention)**

(6) \_\_\_\_\_

Amount Due this Application:

(7)= (5-6) \_\_\_\_\_

Vendor Number										Subcontract A/P Coding Slip									
Job #										Contract #									
Retention Release Y=Yes with amount shown as Invoice Amount.																			
Invoice Date										Due Date									
Invoice Number																			
Description																			
Invoice Amount																			
Retention																			
										Accounting									
										Approval									

**Do not write on the coding slip/for Cullen use only.**

The undersigned subcontractor hereby states under oath that all monies received for the performance of this contract, whether received previously or to be received now or in the future, shall be and have been used exclusively for labor and material entering into this work, and said monies shall not be and have not been diverted to satisfy obligations of this subcontractor on other contracts or for any other purpose unless and until all payments for labor and material entering into this work have been made, in full, through to the completion of the entire job covered by this contract.

This application accurately reflects the amounts due on date hereof to this subcontractor and accurately reflects all other information inserted on this form.

All previous progress payments received on this job on account of work performed or materials or services provided under the contract referred to above have been applied by the undersigned to discharge in full all obligations of the undersigned incurred in connection with work covered by prior applications for payment under said contract. Title and all rights and interest in the work, materials, and equipment covered by this application for payment, whether incorporated into the project or not, will pass to the owner upon receipt of such payment by the undersigned, free and clear of all liens, claims, security interests, and encumbrances.

All payrolls, wages, union benefits, withholding taxes, bills for materials and equipment, and all other indebtedness connected with subcontractor's work for which the owner or his property or J. P. Cullen & Sons, Inc. or surety might in any way be liable have been paid or otherwise satisfied.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

(Name of Subcontractor)

By: \_\_\_\_\_

Signature of: \_\_\_\_\_

Title: \_\_\_\_\_

STATE OF \_\_\_\_\_ )  
COUNTY OF \_\_\_\_\_ ) ss.

Before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, personally  
appeared \_\_\_\_\_, known to me, who is being duly sworn, did depose and say that  
he/she is the \_\_\_\_\_ (Office) of the contractor above-mentioned; that he/she  
executed the above Application for Payment and statement on behalf of said contractor; and that  
all of the statements contained herein are true, correct, and complete.

Notary Public

County of \_\_\_\_\_ State of \_\_\_\_\_

My Commission Expires: \_\_\_\_\_

**This 3-Page Form May Be Reproduced, But It Must Be Exact**



## **PARTIAL WAIVER OF LIEN**

Whereas, we the undersigned (Subcontractor Name) have contracted with J.P. Cullen & Sons, Inc. to furnish material and perform services, to enter into the erection, construction, alteration and repair of certain improvements, now in progress or about to be begun, upon the following described real estate, situated in the County of County Name, State of State Name, to-wit:

**Project Name**

**City, State**

Now, therefore, we the undersigned, for and in consideration of **Payment Amount Dollars and XX/100 – (\$XXX.XX)** acknowledged, do hereby waive and release any and all lien, or claim, or right of lien, on said above described real estate and on all buildings, improvements and appurtenances situated thereon or thereunto belonging, on account of labor, or materials, or both, furnished by the undersigned to or on account of the said J.P. Cullen & Sons, Inc. for said building or premises.

Given under our hand and seal on this DD<sup>nd</sup> day of Month, 20YY.

Company: **Subcontractor Name**

Signed: \_\_\_\_\_



## **FINAL WAIVER OF CONSTRUCTION LIEN**

For value received, the undersigned hereby waives all rights on or claims for a lien on the land hereafter described, for any and all work, materials, plans, and specifications made or furnished or to be made or furnished for the improvement of said lands, said improvements being done for Owners Name, Owner, by J.P. Cullen & Sons, Inc., prime contractor, said lands being situated in County Name County, State of State Name, and described as follows:

Project Name

City, State

Date of this Waiver:

Month DD, YYYY

Signed:

Subcontractors Name

\_\_\_\_\_

Lien waivers are to be returned as soon as possible to:

J.P. Cullen & Sons, Inc.  
333 East Delavan Drive  
Janesville, WI 53547

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

## SECTION 01 17 00 SAFETY REQUIREMENTS

### 1.1 Implementation

- A. Each subcontractor is responsible for his/her own safety program in accordance with applicable provisions of the Occupational Safety and Health Act.
- B. Each subcontractor shall be responsible for payment of all fines and/or claims for damages levied against the Construction Manager and/or the Owner for safety deficiencies relating to conduct of subcontractor's work.
- C. Every subcontractor shall comply with all applicable local, state and federal safety and health regulations.
- D. Safety Procedures for Contractors and/or Subcontractors

- 1. As a Subcontractor and employer, you are required by Federal and State Occupational Safety and Health Regulations, Standards, Codes, Rules and Regulations, to provide protection for customers, employees and the public who may come into contact with your operations.

- 2. Employee Safety Orientation and Safety Meetings

Each subcontractor or its subcontractor(s) shall follow OSHA Act 1926.21 (2) requirements that state, "Each employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to its work environment".

- 3. Accident Reports

In the case of an injury to an employee of the subcontractor or its subcontractor(s) requiring treatment in addition to first aid, the employer will furnish the Construction Manager the "First Report of Injury" and a Foreman's Accident Report within 24 hours after the occurrence.

In the case of an accident involving property damage or injury to a person who is not an employee of the contractor, the subcontractor or its subcontractor(s), the Construction Manager will be immediately notified and a Foreman's Accident Report will be submitted within 24 hours after the occurrence.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

SECTION 01 17 10  
FIRE PRECAUTION AND PROTECTION

1.1 Description

- A. Provide adequate fire protection during the construction process.

1.2 Fire Extinguishers

- A. The Construction Manager will provide and maintain in working order during the entire construction period, fire extinguishers as required and suitable for any possible class or type of fire.
- B. In addition, each subcontractor who maintains an enclosed shed on the premises for storage of materials or as a workshop, or for the convenience of workmen, shall provide and maintain one fire extinguisher for each shed.

1.3 Fire Protection of Construction Activities

Each subcontractor shall:

- A. Provide adequate protection and shielding of workers and materials during welding, flame cutting, sparking devices, etc.
- B. Provide the necessary personnel and fire fighting equipment to effectively control fires resulting from welding flame cutting or other operations involving the use of flame and sparking devices.
- C. Have their Superintendent in charge of the project meet with the Construction Manager to review the entire project on intervals as requested by the Construction Manager to make certain that they adhere to the conditions and requirements set forth herein.
- D. Take all necessary precautions to guard against and eliminate all possible fire hazards in accordance with all fire protection and prevention laws and codes. Also, all necessary precautions shall be taken to prevent damage to any construction work, building materials equipment, temporary field offices, storage sheds and all other property.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

SECTION 01 20 00  
MEETINGS

1.1 Description

- A. Work included: In order to enable orderly review during progress of the work and to provide for systematic discussion of problems, the Construction Manager will conduct project meetings throughout the construction period.

1.2 Meeting Schedule

- A. Project meetings will be held at times designated by the Construction Manager. Subcontractors shall attend all project meetings required by the Construction Manager and shall furnish regular progress reports on the work and the status of materials and equipment under their contracts. Subcontractors shall send a representative authorized to make binding decisions on behalf of the subcontractor's company to all required meetings.

1.3 Preconstruction Meeting

- A. A preconstruction meeting, if required, will be scheduled after verbal notice to proceed.
  - 1. Authorized representatives of the subcontractor shall attend.
  - 2. The Construction Manager will advise other interested parties, including the Owner and the Architect, and request their attendance.
- B. Minimum agenda: Data will be distributed and discussed on at least the following items.
  - 1. Organizational arrangement of subcontractor's forces and personnel, and those subcontractors, material suppliers, and Architect.
  - 2. Channels of and procedures for communication.
  - 3. Construction schedule, including sequence of critical work.
  - 4. Contract documents, including distribution of required copies of original documents and revisions.
  - 5. Processing of shop drawings and other data submitted to the Construction Manager for submittal to the Architect.
  - 6. Processing of field decisions and change orders.
  - 7. Rules and regulations governing performance of the work.
  - 8. Procedures for security, quality control, housekeeping, and related matters.

#### 1.4 Scheduling Meetings for Pre-Job Planning

#### 1.5 Bi-weekly Progress Meetings

- A. Bi-weekly shall be held at the job site. The Construction Manager shall update the CPM schedule to reflect the current status of the project. During the presentation the Construction Manager will specifically address those critical area(s) of concern as determined by the schedule update where immediate action by the subcontractors is required.

To the maximum extent practical, assign the same person or persons to represent the subcontractor at project meetings throughout the progress of the work. Subcontractors, material suppliers, and others may be invited to attend those project meetings in which their aspect of the work is involved.

- B. Agenda for progress meetings shall be as follows:

1. Additions/Corrections
2. Schedule
3. Safety
4. Shop drawing status
5. Changes
6. Past meeting business
7. New business
8. Meeting schedule

#### 1.6 Pre-installation Meetings

- A. Pre-installation meetings shall be held at the job site for all construction activities with on-site labor and for other activities as deemed necessary by the Construction Manager.
- B. Pre-installation meetings shall be attended by the Construction Manager's Superintendent, Project Manager, the subcontractor Superintendent and Project Manager and (when appropriate) the Owner and Architect's representative.

- C. Agenda for Pre-installation meetings shall be as follows:

1. Introduction
2. Review of specifications
3. Shop drawings/samples
4. Schedule and job mobilization
5. Coordination
6. Review anticipated punch list items
7. Recap

#### 1.7 Daily End of Shift Meeting

- A. Daily End of Shift Meetings shall be held at the job site for all subcontractor foremen working on the project.
- B. Agenda for the Daily End of Shift Meeting shall be as follows:



1. Safety
2. Progress Against that Day's Plan
3. Planned Activities for Next Day
4. Urgent Last Minute Needs
  - i. Information
  - ii. Tools
  - iii. Materials / Equipment
  - iv. Environment

#### 1.8 Project Meetings

- A. To be determined by on-site personnel.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

## **SECTION 01 21 00**

### **ALLOWANCES**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

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

##### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
  - 1. Lump-sum allowances.
  - 2. Unit-cost allowances.
  - 3. Quantity allowances.
  - 4. Contingency allowances.
  - 5. Testing and inspecting allowances.
- C. Related Requirements:
  - 1. Section 01 22 00 - Unit Prices, for procedures for using unit prices, including adjustment of quantity allowances when applicable.
  - 2. Section 01 40 00 - Quality Requirements, for procedures governing the use of allowances for field testing by an independent testing agency.

##### **1.3 DEFINITIONS**

- A. Allowance is a quantity of work or dollar amount established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

##### **1.4 SELECTION AND PURCHASE**

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

##### **1.5 ACTION SUBMITTALS**

- A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

## **1.6 INFORMATIONAL SUBMITTALS**

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

## **1.7 LUMP-SUM ALLOWANCES**

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
  - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

## **1.8 UNIT-COST ALLOWANCES**

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
  - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

## **1.9 QUANTITY ALLOWANCES**

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
  - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

#### **1.10 CONTINGENCY ALLOWANCES**

- A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

#### **1.11 TESTING AND INSPECTING ALLOWANCES**

- A. Testing and inspecting allowances include the cost of engaging testing agencies, actual tests and inspections, and reporting results.
- B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum.
- C. Costs of testing and inspection services not required by the Contract Documents are not included in the allowance.
- D. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

#### **1.12 ADJUSTMENT OF ALLOWANCES**

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
  - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
  - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
  - 3. Submit substantiation of a change in scope of Work, if any, claimed in Change Orders related to unit-cost allowances.
  - 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
  - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.
  - 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

## **PART 2 - PRODUCTS**

**NOT USED**

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

### **3.2 PREPARATION**

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

### **3.3 SCHEDULE OF ALLOWANCES**

#### **A. Allowance No. 1: Undercutting Allowance:**

Include in Base Bid, an allowance for all labor, equipment, and materials (including trucking to and removal of spoils from the site) required for undercuts totaling 4,000 cubic yards. (Undercutting method and materials as described within specification section 31 05 00 – Common Work results for Earthwork - Outside Building Footprint and specification section 31 00 00 Earthwork for Building). Allowance shall be equal to the undercutting unit price provided times the quantity stated here. For approved quantities in excess of the Undercutting allowance, the Undercutting cost will be paid in accordance with the required Undercutting unit price. Any unused portion of the allowance shall be refunded to the owner as a credit at the end of the project.

#### **Unit Price Number 1:**

Cost per Cubic Yard for Undercutting (as defined in 31 05 00 - Common Work Results for Earthwork (Outside Building Footprint) and specification section 31 00 00 Earthwork for Building specifications), including removal and replacement, as well as all trucking to and removal of spoils from the site.

**END OF SECTION**

## **SECTION 01 25 00**

### **SUBSTITUTION PROCEDURES**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Section includes:
  - 1. Substitution requests.

##### **1.2 GENERAL**

- A. Definition: Proposal by Contractor to use manufacturer, product, material, or system different from one required in Contract Documents.
- B. Do not substitute Products unless a substitution request has been approved by Architect.
- C. Substitutions only allowed during Bidding: Refer to Instructions to Bidders.
- D. In case of non-availability of a specified Product notify Architect in writing as soon as non-availability becomes apparent.

##### **1.3 SUBSTITUTION REQUESTS**

- A. Submit substitution requests on form provided by Architect.
- B. Document specified product and proposed substitution with complete data, including:
  - 1. Product identification, including name and address of manufacturer.
  - 2. Product description, performance and test data, and reference standards.
  - 3. Sample, if requested.
  - 4. Description of any anticipated effect that acceptance of proposed substitution will have on Progress Schedule, construction methods, or other items of Work.
  - 5. Description of any differences between specified product and proposed substitution.
  - 6. Difference in cost between specified product and proposed substitution.
- C. Burden of proof for substantiating compliance of proposed substitution with Contract Document requirements remains with Contractor.
- D. A request constitutes a representation that the Contractor:
  - 1. Has investigated the 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 for design services associated with re-approval by authorities or revisions to Contract Documents to accommodate the substitution.
- E. Substitutions will not be considered if:
  - 1. They are indicated or implied on Shop Drawings or other submittals without submittal of a substitution request.
  - 2. Approval will require substantial revision of Contract Documents without additional compensation to Architect.

- F. Submit electronically only in Adobe PDF format. No secondary format deliveries will be accepted.
- G. Architect will notify Contractor of approval or rejection of each Substitution Request.

#### **1.4 CONTRACTOR'S USE OF SITE AND PREMISES**

- A. Limit use of site and premises to allow for:
  - 1. Work by separate contractors.
  - 2. Work by Owner.
  - 3. Owner occupancy.
  - 4. Use of site and adjacent premises by the public.

**END OF SECTION**



**DOCUMENT 01 25 19**  
**SUBSTITUTION REQUEST FORM**

**DATE:** \_\_\_\_\_, \_\_\_\_\_, 2022

**TO:** \_\_\_\_\_

**ATTENTION:** \_\_\_\_\_

**PROJECT:** \_\_\_\_\_

**1.1 We submit for your consideration the following product as a substitution for the specified product:**

Section No.	Paragraph	Specified Product
-------------	-----------	-------------------

_____	_____	_____
-------	-------	-------

Proposed Substitution: \_\_\_\_\_

\_\_\_\_\_

Reason for Substitution: \_\_\_\_\_

\_\_\_\_\_

**1.2 Product Data:**

Attach complete technical data for both the specified product and the proposed substitution. Include information on changes to Contract Documents that the proposed substitution will require for its proper installation.

**1.3 Samples:**

\_\_\_ Attached \_\_\_ Will be furnished upon request

Does the substitution affect dimensions shown on Drawings?

\_\_\_ No                      \_\_\_ Yes (explain) \_\_\_\_\_

\_\_\_\_\_

Effects of proposed substitution on other Work:

\_\_\_\_\_

\_\_\_\_\_

Differences between proposed substitution and specified Product:

\_\_\_\_\_

Manufacturer's warranties of the proposed substitution are:

☐ Same ☐ Different (explain) \_\_\_\_\_

\_\_\_\_\_

Maintenance service and spare parts are available for proposed substitution from:

\_\_\_\_\_

\_\_\_\_\_

Previous installations where proposed substitution may be seen:

Project: \_\_\_\_\_ Project: \_\_\_\_\_

Owner: \_\_\_\_\_ Owner: \_\_\_\_\_

Architect: \_\_\_\_\_ Architect: \_\_\_\_\_

Date Installed: \_\_\_\_\_ Date Installed: \_\_\_\_\_

Cost savings to be realized by Owner, if proposed substitution is approved:

\_\_\_\_\_

Change to Contract Time, if proposed substitution is approved:

☐ No Change ☐ Add \_\_\_\_\_ days ☐ Deduct \_\_\_\_\_ days

**Submitted by Contractor:**

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Firm

**Architect Response:**

Based on the information supplied by the [Contractor,] [Construction Manager,] the Architect has reviewed the proposed substitution on the basis of design concept of the Work and conformance with information given in Contract Documents.

☐ Approved ☐ Approved as Noted ☐ Rejected

Submit Additional Information: \_\_\_\_\_

\_\_\_\_\_

By: \_\_\_\_\_ Date: \_\_\_\_\_

## **SECTION 01 26 00**

### **CONTRACT MODIFICATION PROCEDURES**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

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

##### **1.2 SUMMARY**

- A. Section includes:
  - 1. Supplemental Instructions.
  - 2. Proposal Requests.
  - 3. Contractor proposed changes.
  - 4. Construction Change Directives.
  - 5. Change Orders.

##### **1.3 CHANGE PROCEDURES**

- A. Architect's Supplemental Instructions:
  - 1. Format: AIA Document G710 - Architect's Supplemental Instructions.
  - 2. Architect will advise of minor changes in Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract.
- B. Proposal Requests:
  - 1. Format: AIA Document G709 - Proposal Request.
  - 2. Architect may issue a Proposal Request that includes a detailed description of a proposed change with supplemental or revised Drawings and specifications.
  - 3. Prepare and submit an estimate of any change to the Contract Sum or Contract Time within 7 days after receipt. Include:
    - a. Quantities and unit costs, with total cost or credit to Owner.
    - b. Regarding Contractor's proposal request, the following cost information is required to be provided for Architect's evaluation of the proposed changes:
      - 1) Labor
      - 2) Labor Fringes, Insurance and Taxes
      - 3) Materials
      - 4) Supplies
      - 5) Equipment – Owned
      - 6) Equipment – Rented
      - 7) Subcontractors
      - 8) Supervision
      - 9) General Conditions/Field Overhead
      - 10) Insurance
      - 11) Taxes
      - 12) Permits
      - 13) Bonds
  - 4. If change in Contract Time is involved, provide updated Progress Schedule.
  - 5. Do not stop work or initiate changes in response to a Proposal Request. If approved, Architect will prepare and issue a Change Order.
  - 6. Submit to Architect electronically in Adobe PDF format.
- C. Contractor Proposed Changes:
  - 1. Format: Contractor's standard.

2. Contractor may propose a change by submitting request for change to Architect.
  3. Describe proposed change, reason for change, its full effect on Work, and any change to Contract Sum or Contract Time. Include the following:
    - a. Quantities and unit costs, with total cost or credit to Owner. If requested, furnish documentation of quantities.
    - b. Regarding Contractor's proposed changes, the following cost information is required to be provided for Architect's evaluation of the proposed changes:
      - 1) Labor
      - 2) Labor Fringes, Insurance and Taxes
      - 3) Materials
      - 4) Supplies
      - 5) Equipment – Owned
      - 6) Equipment – Rented
      - 7) Subcontractors
      - 8) Supervision
      - 9) General Conditions/Field Overhead
      - 10) Insurance
      - 11) Taxes
      - 12) Permits
      - 13) Bonds
    - c. If change in Contract Time is involved, provide updated Progress Schedule.
  4. Document any required substitutions in accordance with Section 01 25 00 – Substitution Procedures.
  5. Submit electronically to Architect only in Adobe PDF format. Adobe product only.
- D. Construction Change Directive:
1. Architect may issue a directive, signed by Owner, instructing Contractor to proceed with a change for subsequent inclusion in a Change Order.
  2. Documentation will describe changes in Work and designate method of determining any change to Contract Sum or Contract Time. Promptly execute change.
- E. Change Orders:
1. Format: AIA Document G701 - Change Order.
  2. Execution: Architect will issue Change Orders for signature of parties as provided in Conditions of the Contract. Submit electronically in Adobe PDF format.
  3. Submit electronically in Adobe PDF format.

## **PART 2 - PRODUCTS – NOT USED**

## **PART 3 - EXECUTION – NOT USED**

**END OF SECTION**

## **SECTION 01 26 13**

### **REQUESTS FOR INFORMATION**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Section includes:
  - 1. Requests for Information (RFI's).
- B. Related Sections:
  - 1. Section 01 25 00 - Substitution Procedures.
  - 2. Section 01 26 00 - Contract Modification Procedures.
  - 3. Section 01 33 00 - Submittal Procedures.
  - 4. Section 01 77 00 - Closeout Procedures.

##### **1.2 GENERAL**

- A. Request for Information (RFI): Request from Contractor seeking interpretation or clarification of Contract Documents not involving Substitutions or changes to Contract Sum or Contract Time.
- B. RFI's constitute a request for information only.
- C. Do not submit RFI's:
  - 1. To request approval of Substitutions. Reference Section 01 25 00 – Substitution Procedures.
  - 2. To request changes known to include changes to Contract Sum or Contract Time. Reference Section 01 26 00 - Contract Modification Procedures.
  - 3. To request approval of submittals; Reference Section 01 33 00 – Submittal Procedures.
  - 4. To submit Project Record Documents; Reference Section 01 77 00 – Project Closeout.

##### **1.3 SUBMITTAL**

- A. Submit RFI's on Contractor's standard form, submit electronically in Adobe PDF format.
- B. All RFI's shall be sent to the Architect through email. It is at the discretion of the Architect if utilization of the Contractors project management software is an acceptable in lieu of email.
- C. Include on each RFI:
  - 1. Name of Contractor.
  - 2. Project name.
  - 3. Date submitted.
  - 4. Sequential RFI number.
  - 5. Applicable Drawing sheet and detail numbers or Specification Section numbers.
  - 6. Date when response information is required to avoid impact on Construction Schedule and Construction Cost.
- D. Review and sign RFI's submitted by Subcontractors, Sub-Subcontractors, or Suppliers prior to submittal to Architect.
- E. Maintain log of RFI's showing RFI number and current status of each RFI.
- F. When RFI's require submittal of drawings, follow submittal procedures specified for Shop Drawings in Section 01 33 00 – Submittal Procedures.
- G. Allow minimum fourteen (14) days for Architect's review and response to each RFI.

**END OF SECTION**

## SECTION 01 31 00 CONSTRUCTION SCHEDULE

### 1.1 Description

#### A. Work included:

1. To ensure adequate planning and execution of the work so that the work is completed within the number of calendar days allowed in the contract.
2. To assist the Construction Manager in appraising the reasonableness of the proposed schedule and in evaluating progress of the work.
3. To prepare and maintain the schedules and reports described in this section.

#### B. Related work:

1. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Divisions 0 and 1 of these Specifications.
2. Requirements for progress schedule: General Conditions.
3. Construction period: Form of Agreement.

#### C. Definitions:

1. "Day," as used throughout the contract unless otherwise stated, means "calendar day."

### 1.2 Scheduling Requirements

- A. Various Subcontractors will be required to collaborate with the Construction Manager shall develop a work schedule which integrates all the activities of the Subcontractors and suppliers, and which meets the requirements of the Owner and Architect. The final scheduled sequence of all such activities shall be determined by the Construction Manager. All scheduling information shall be submitted to the Construction Manager within 5 days after requested. the Construction Manager shall provide periodic schedule updates throughout the duration of the project. After each schedule update, subcontractors shall have 5 working days to respond, in writing, with any proposed corrections/modifications. Failure to do so within the 5 day period will serve as an implied acceptance of the updated schedule and shall make the subcontractor and vendors full contractually obligated to meet each of the scheduled activity completion dates."

**The subcontractor shall fully complete the work in accordance with the Construction Manager's construction schedule and/or current job progress.**

- B. The Construction Manager shall utilize the CPM Schedule to plan, coordinate, and manage all construction activities of the subcontractors and suppliers. Subcontractors shall complete their work in accordance with the CPM Schedule

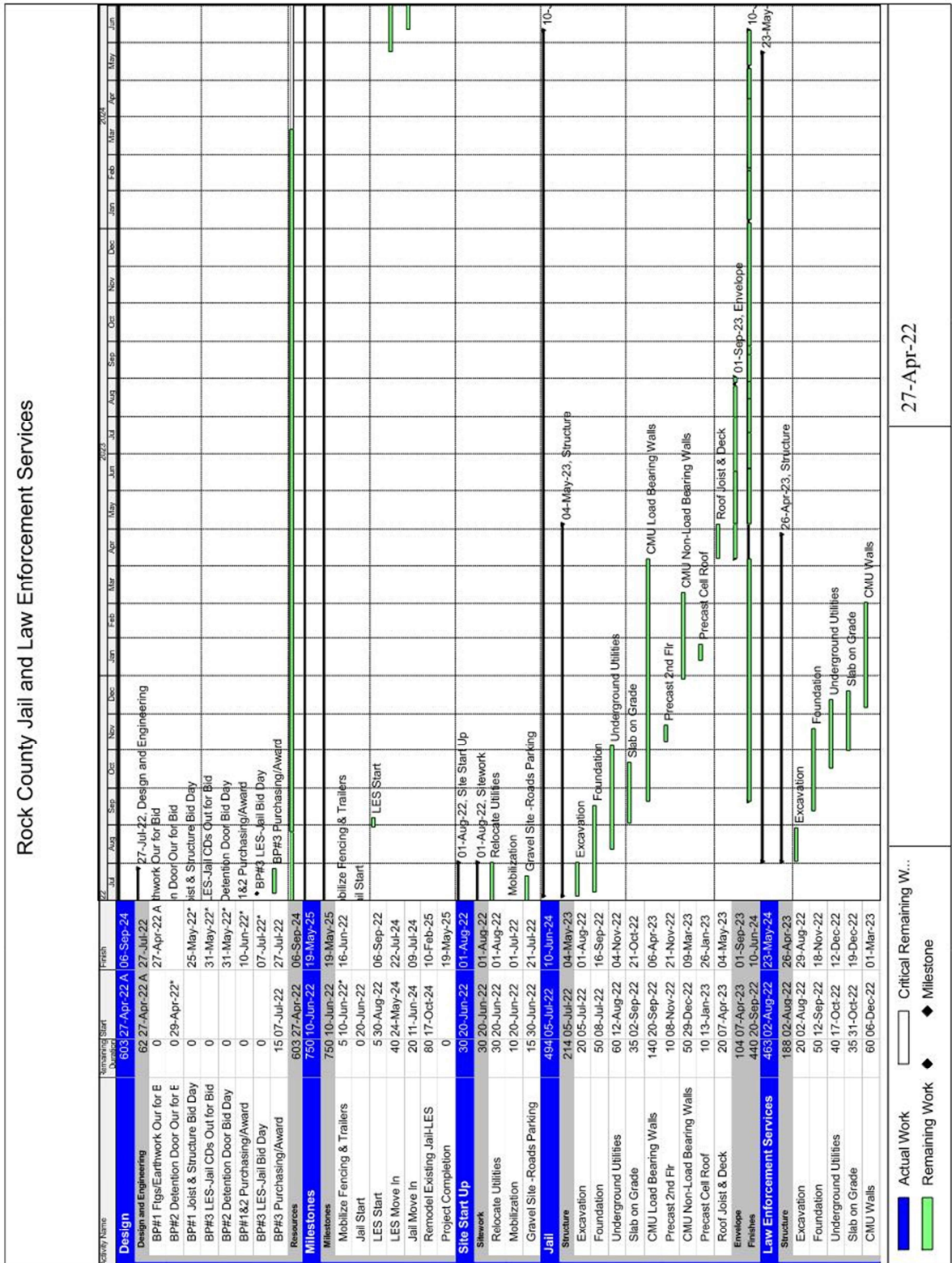
and/or current job progress.

- C. The Construction Manager reserves the right to assist the various subcontractors in the expediting of their material and equipment deliveries without assuming the responsibility for said deliveries. Upon request, the subcontractors shall furnish copies of their equipment and material purchase orders, including scheduled shipping and receiving dates, to the Construction Manager.
- D. Whenever it becomes apparent from the monthly "updated" schedule that any activity completion date may not be met, the responsible subcontractors shall take some or all of the following actions at no additional cost to the Owner or the Construction Manager.
  - 1. Increase construction manpower in such quantities that will substantially eliminate the backlog of work and put the project back on schedule and/or keep up with current job progress.
  - 2. Increase the number of working hours per shift, shifts per working day, working days per week, or the amount of construction equipment, or any combination of the above which will substantially eliminate the backlog of work and put the project back on schedule and/or keep up with current job progress.
  - 3. Reschedule activities to achieve maximum practical concurrence of activities to put the project back on schedule and/or keep up with current job progress.

If a subcontractor fails to take any of the above actions within forty-eight (48) hours after receiving written notice, the Construction Manager shall take action to attempt to put the project back on schedule and/or keep up with current job progress, and deduct the cost of such actions from the compensation which is or will become due the subcontractor.

### 1.3 Construction Schedule – Attached





[illegible]

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

## **SECTION 01 33 00**

### **SUBMITTAL PROCEDURES**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Section includes:
  - 1. Submittal procedures.
  - 2. Product data.
  - 3. Shop drawings.
  - 4. Samples.
  - 5. Design data.
  - 6. Test reports.
  - 7. Certificates.
  - 8. Manufacturer's instructions.
  - 9. Manufacturer's field reports.
  - 10. Construction progress schedules.
  - 11. Proposed products list.
  - 12. Erection drawings.
  - 13. Construction photographs.

##### **1.2 SUBMITTAL PROCEDURES**

- A. All submittals shall be sent in Adobe PDF format, and shall be complete with all required information submitted at the same time.
- B. All submittal shall be sent to the Architect through email, actual samples shall be mailed. It is at the discretion of the Architect if utilization of the Contractors project management software is an acceptable in lieu of email.
- C. Shop drawings shall be submitted electronically in one PDF format file. File name shall contain specification number and product name.
- D. Each submittal shall include a cover sheet with the following information.
  - 1. Submittal Date
  - 2. Specification Section(s)
  - 3. Manufacturer's Representative (Contact Name, address, and telephone number)
  - 4. Contractor (Contact Name, address, and telephone number)
  - 5. Project Name, Project City, Project State, and Project Address.
- E. Drawings shall bear the stamp of approval of the Contractor as evidence that the drawings have been checked by the Contractor. Any drawings submitted without this stamp of approval will not be considered and will be returned to the Contractor for resubmission.
- F. Submittals must be 100% complete per requirements of each entire corresponding specification section and in one (1) package. Non-complete submittals will be returned to the contractor without comment and stamped "rejected-resubmit". Contractors who knowingly want to submit non-complete submittals or break single system submittals into multiple submittals will be responsible to arrange with Architect, prior to submitting the submittal(s), and to compensate Architect for the extra work involved.
- G. Contractor shall allow 10 working days in schedule for A/E to review submittals. If submittals require an expedited review process, contact Architect prior to submitting the submittal(s) to make the appropriate arrangement.
- H. Submittals requiring resubmission shall have changes made to a previously reviewed submittals denoted with revision clouds and tags identifying those changes.

- I. Mechanical and Electrical Contractors shall include the following:
  1. Equipment List:
    - a. A complete equipment list of all components, including the following: Quantity, Manufacturer, Part Number, and Description.
    - b. If the supplier uses different part numbers from those of the actual manufacturer, the actual manufacturer and part numbers as they appear - marked on the shipping box/packages, shall also be identified on this list.
  2. Product Data:
    - a. Manufacturer's product data sheets, and equipment description of all system components.
    - b. Data sheets shall be highlighted or suitably marked, so that included items and options are indicated.
    - c. On data sheets that include multiple products, products that are not used shall be crossed out. Product Data Sheets shall be organized, in order, corresponding to the FIRST occurrence of the corresponding item on the equipment list.

### **1.3 PRODUCT DATA**

- A. Product Data: Submit to Architect for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

### **1.4 SHOP DRAWINGS**

- A. Shop Drawings: Submit to Architect for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. When required by individual specification sections, provide shop drawings signed and sealed by professional Engineer responsible for designing components shown on shop drawings.
  1. Include signed and sealed calculations to support design.
  2. Submit drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
  3. Make revisions and provide additional information when required by authorities having jurisdiction.
- D. Submit number of copies described in Submittal Procedures article.

### **1.5 SAMPLES**

- A. Samples: Submit to Architect for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Submit number of samples specified in individual specification sections; Architect will retain one sample.
- C. Samples for Selection as Specified in Product Sections:
  1. Submit to Architect for aesthetic, color, or finish selection.
  2. Submit samples of finishes from full range of manufacturers' available colors, in available textures and patterns for Architect selection.
  3. When custom color is specified, submit actual sample of custom color for Architect approval.

- D. Submit samples to illustrate functional and aesthetic characteristics of Products with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- E. Include identification on each sample with full Project information.
- F. Reviewed samples which may be used in the Work are indicated in individual specification sections.
- G. Samples will not be used for testing purposes unless specifically stated in specification section.
- H. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents purposes described in Section 01 70 00 – Project Closeout.

#### **1.6 DESIGN DATA**

- A. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in the Contract Documents.

#### **1.7 TEST REPORTS**

- A. Submit for Architect's knowledge.
- B. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

#### **1.8 CERTIFICATES**

- A. When specified in individual specification Sections, submit certification by manufacturer, installation/application subcontractor, or Contractor to Architect.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect.

#### **1.9 MANUFACTURER'S INSTRUCTIONS**

- A. When specified in individual specification Sections, submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing to Architect for delivery to Owner.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

#### **1.10 MANUFACTURER'S FIELD REPORTS**

- A. Submit reports for Architect's knowledge as Contract Administrator or for Owner.
- B. Submit report within 72 hours of observation to Architect for information.
- C. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

#### **1.11 CONSTRUCTION PROGRESS SCHEDULES**

- A. Submit initial schedules within 15 days after date established in Notice to Proceed. After review, resubmit required revised data within 10 days.
- B. Submit revised Progress Schedules with each Progress Meeting or Application for Payment, but not less than monthly.
- C. Distribute copies of reviewed schedules to Project site file, subcontractors, suppliers, and other concerned parties.
- D. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.
- E. Submit computer generated chart with separate line for each major portion of Work or operation, identifying first work day of each week.
- F. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate early and late start, early and late finish, float dates, and duration.
- G. Indicate estimated percentage of completion for each item of Work at each submission.
- H. Submit separate schedule of submittal dates for shop drawings, product data, and samples. Indicate dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.
- I. Indicate delivery dates for Owner furnished products and products identified under Allowances if required.
- J. Revisions to Schedules:
  - 1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
  - 2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
  - 3. Prepare narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect, including effect of changes on schedules of separate contractors.

#### **1.12 PROPOSED PRODUCTS LIST**

- A. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

#### **1.13 ERECTION DRAWINGS**

- A. Submit drawings for Architect's knowledge.
- B. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.
- C. Data indicating inappropriate or unacceptable Work may be subject to action by Architect.

#### **1.14 CONSTRUCTION PHOTOGRAPHS**

- A. Provide photographs of site and construction throughout exterior progress of Work produced by an experienced photographer, acceptable to Architect.



- B. Submit photographs monthly or to show milestones of Work.
- C. Take three photographs from differing directions for each section of work indicating relative progress of the Work, three days maximum prior to submitting.
- D. Take photographs as evidence of existing project conditions.
- E. Identify each print on front. Identify name of Project, contract number, phase orientation of view, date and time of view, name and address of photographer, and photographer's numbered identification of exposure.
- F. Deliver negatives to Owner with project record documents. Catalog and index negatives in chronological sequence; include typed table of contents

**END OF SECTION**

**THIS PAGE INTENTIONALLY BLANK**

**SECTION 01 40 00**  
**QUALITY REQUIREMENTS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. References.
  - 2. Quality assurance and control of installation.
  - 3. Mockups.
  - 4. Manufacturer's field services and reports.
  - 5. Design data and calculations.
  - 6. Test reports and certifications.
  - 7. Manufacturer's installation instructions.

**1.2 REFERENCES**

- A. For products or workmanship specified by reference to association, trade, or industry standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Conform to edition of reference standard in effect as of date of Project Manual.
- D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

**1.3 QUALITY ASSURANCE AND CONTROL OF INSTALLATION**

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully 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 a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

**1.4 MOCKUPS**

- A. Definition:
  - 1. Mockups are field samples constructed, applied, or assembled at the project site for review by the Owner and Architect that illustrate materials, equipment, or workmanship.

- 2. Approved mockups establish the standard of quality by which the Work will be judged.
- B. Construct, apply, or assemble specified items, with related attachment and anchorage devices, flashings, seals, and finishes.
- C. Perform work in accordance with applicable specifications sections.
- D. Erect at project site at location acceptable to Architect. Protect from damage.
- E. Removal:
  - 1. Mockups may remain as part of the Work only when so designated in individual specification sections.
  - 2. Do not remove mockups until removal is approved by Architect or upon Final Completion.
  - 3. Where mockup is not permitted to remain as part of the Work, clear area after removal of mockup has been approved by Architect.

#### **1.5 MANUFACTURERS' FIELD SERVICES AND REPORTS**

- 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, or startup of equipment, as applicable, and to initiate instructions when necessary.
- B. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- C. Submit report to Architect within 10 days of observation.

#### **1.6 DESIGN DATA AND CALCULATIONS**

- A. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide design data and calculations.
- B. Accuracy of design data and calculations is the responsibility of the Contractor.
- C. When so specified, prepare design data and calculations under the direction of a professional engineer licensed in the state in which the Project is located. Affix engineer's seal to submittals.
- D. Submit electronically in Adobe PDF format.

#### **1.7 TEST REPORTS AND CERTIFICATIONS**

- A. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide test reports and manufacturers' certifications.
- B. Indicate that material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Submittals may be recent or previous test results on material or Product, but must be acceptable to Architect.
- D. Submit electronically in Adobe PDF format.

#### **1.8 MANUFACTURER'S INSTALLATION INSTRUCTIONS**

- A. When Contract Documents require that Products be installed in accordance with manufacturer's instructions:

1. Submit manufacturer's most recent printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, as applicable.
  - a. Submit in quantities specified for Product Data.
  - b. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
  - c. Identify conflicts between manufacturers' instructions and requirements of Contract Documents.
2. Perform installation of Products to comply with requirements of manufacturer's instructions.
3. If installation cannot be performed in accordance with manufacturer's instructions, notify Architect and await instructions.
4. Submit electronically in Adobe PDF format.

**END OF SECTION**

**THIS PAGE INTENTIONALLY BLANK**

## **SECTION 01 45 23**

### **TESTING AND INSPECTION SERVICES**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

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

##### **1.2 SUMMARY**

- A. Section includes:
  - 1. Laboratory selection and payment.
  - 2. Laboratory duties.
  - 3. Contractor's responsibilities.
- B. Related Sections:
  - 1. Individual specifications sections contain specific tests and inspections to be performed.

##### **1.3 REFERENCE STANDARDS**

- A. ASTM International (ASTM):
  - 1. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
  - 2. ASTM D3666 - Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials.
  - 3. 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.
  - 4. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection and/or Testing.
  - 5. ASTM E543 - Standard Specification

##### **1.4 QUALITY ASSURANCE**

- A. The 2015 International Building Code (IBC), as modified by the State of Wisconsin Chapters SPS 361-366 - Commercial Building Code, governs the requirements for products, materials, components, and systems that are indicated on the Drawings and specified in the Project Manual.
- B. Contractor shall employ and pay for services of an independent testing laboratory to perform specified testing and inspection.
- C. Employment of Testing Laboratory shall in no way relieve Contractor of their obligations to perform work in accordance with Contract Documents.
- D. Refer to the Conditions of the Contract for provisions related to special inspections and testing.
- E. Qualifications of Laboratory:
  - 1. Meet requirements of ASTM C1077, ASTM D3666, ASTM D3740, ASTM E329 and ASTM E543.
  - 2. Authorized and licensed to operate in the State of Wisconsin.

## **1.5 LABORATORY DUTIES**

- A. Cooperate with Architect and Contractor. and provide qualified personnel after due notice.
- B. Perform specified inspections, sampling, and testing of materials and methods of construction:
  - 1. Comply with specified standards.
  - 2. Ascertain compliance or noncompliance of materials with requirements of Contract Documents.
- C. Promptly notify Architect and Contractor of observed irregularities or deficiencies of Work or products.
- D. Promptly submit written report of each test and inspection; submit one copies electronically in Adobe PDF format.
- E. Each report to include:
  - 1. Date issued.
  - 2. Project title and number.
  - 3. Testing Laboratory name, address, and telephone number.
  - 4. Name of Inspector and signature of individual in charge.
  - 5. Date and time of sampling or inspection.
  - 6. Record of temperature and weather conditions.
  - 7. Date of test.
  - 8. Identification of product and specification section.
  - 9. Location of sample or test in project.
  - 10. Type of inspection or test.
  - 11. Results of tests and compliance or noncompliance with Contract Documents.
  - 12. Interpretation of test results when requested by Architect or Contractor.
- F. Perform additional tests when required by Architect.
- G. Laboratory is not authorized to:
  - 1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
  - 2. Approve or accept any portion of work.
  - 3. Perform any duties of Contractor.

## **1.6 CONTRACTOR'S RESPONSIBILITIES**

- A. Cooperate with personnel, provide access to Work, and to manufacturer's operations.
- B. When materials require testing prior to being incorporated into Work, secure and deliver to Laboratory adequate quantities of representative samples of materials proposed to be used.
- C. Furnish copies of product test reports as required.
- D. Furnish incidental labor and facilities:
  - 1. To provide access to work to be tested.
  - 2. To obtain and handle samples at site or at source of product to be tested.
  - 3. To facilitate inspections and tests.
  - 4. For safe storage and curing of test samples.
- E. Notify Laboratory sufficiently in advance of operations to allow for Laboratory assignment of personnel and scheduling of tests.
- F. Make arrangements with Laboratory and pay for additional samples and tests required for Contractor's convenience

**END OF SECTION**



**SECTION 01 50 00**  
**TEMPORARY FACILITIES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section includes:
  - 1. Scope
  - 2. Temporary Enclosures
  - 3. Temporary Field Offices
  - 4. Temporary Stairs, Ladders, Ramps, Runways, Scaffolds
  - 5. Temporary Hoist
  - 6. Signs
  - 7. Temporary Sanitary Facilities
  - 8. Cold Weather Protection
  - 9. Temporary Heat
  - 10. Temporary Roof Protection
  - 11. Progress Cleaning

**1.2 TEMPORARY ENCLOSURES**

- A. Contractor shall provide temporary weathertight enclosures for all exterior openings as soon as walls and roof are built so as to protect work from weather. Windows and other openings shall be closed with approved translucent material.

**1.3 TEMPORARY FIELD OFFICES**

- A. Contractors shall provide offices for their own use located as agreed upon between various Contractors and as approved by Architect.
- B. When directed, move offices into suitable area in building.
- C. Sheds for storage of materials that may be damaged by weather shall be provided and maintained by Contractor. Sheds shall have raised wood floors.

**1.4 TEMPORARY STAIRS, LADDERS, RAMPS, RUNWAYS, SCAFFOLDS**

- A. Contractor shall:
  - 1. Provide and maintain temporary stairs, ramps, chutes, runways, etc. as required for proper execution of work by all trades.
  - 2. Erect permanent stair framing as soon as possible. Provide stairs with temporary treads, handrails and shaft protection.
  - 3. Provide exterior and interior scaffolding for and during construction of exterior masonry walls, and allow other Contractors and Sub Contractors to use scaffolds so provided without cost. Sub Contractor and others shall provide their own plank.
- B. Contractors and Sub Contractors requiring scaffolds other than specified shall provide their own and remove on completion of work.
- C. Underlay interior scaffolds with planking to prevent uprights from resting directly on slab.
- D. If any scaffolding or forms collapse during construction, the Contractors are responsible.

### **1.5 TEMPORARY HOIST**

- A. Contractor shall install and maintain hoists as required for proper execution of the general construction work. Build in accordance with local and state requirements.
- B. Do not construct hoists so they will interfere with or affect construction. Locate sufficient distance from exterior walls.
- C. Provide protection to prevent damage, staining and marring of permanent work.
- D. Contractor shall grant all other Contractors and Sub-Contractors use of elevators or hoists at reasonable rates and under reasonable conditions.
- E. Other Contractors and Sub-Contractors shall pay Contractor for use of same hourly rates posted at start of construction.

### **1.6 SIGNS**

- A. Contractor shall erect one (1) painted sign as approved by Owner, giving following information:
  - 1. Name of Project and Owner
  - 2. Name of Architect
  - 3. Names of General, Plumbing, HVAC and Electrical Contractors
- B. Sign shall be not less than 8'-0" wide x 4'-0" high supported by two (2) 4" x 4" posts with 2" x 4" frame.

### **1.7 TEMPORARY SANITARY FACILITIES**

- A. Contractor shall provide and maintain sanitary, temporary chemical type toilets in sufficient number required for the force employed. Toilets shall be self-contained chemical type. Locate where directed.

### **1.8 COLD WEATHER PROTECTION**

- A. Cold Weather Protection:
  - 1. Definition: All covering, heating or both required to protect building from injury due to freezing during construction period prior to enclosure of building.
  - 2. All covering, heating units and fuel required to provide cold weather protection will be provided by and paid for by the Contractor.
  - 3. Requirements for Cold Weather Protection for the project are specified in the specific technical specifications that are effected by cold weather conditions.

### **1.9 TEMPORARY HEAT**

- A. Temporary heating will be provided by Contractor:
  - 1. Temporary heat shall be provided, when required, in all areas and spaces as are roofed and have all exterior openings suitably enclosed.
  - 2. Building will be considered enclosed when it is roofed and has such protection at doorways, windows and other openings as will provide reasonable heat retention.
  - 3. Provide temporary closures for windows, doors and all temporary openings. Supervise effectiveness of all closures and see that every precaution is taken to prevent escape of heat.
  - 4. Temporary heat shall be provided until permanent heating plant and distribution system is ready for operation and construction operations which produce particulates which may contaminate ductwork have been completed. Refer to Division 23.
  - 5. Contractor shall pay the cost of all fuel for temporary heat.
  - 6. Contractor shall provide, install and maintain temporary units of type, size and number required to maintain temperatures specified, complete with all electrical connections.

7. Equipment approved for permanent installation may be used for temporary heating provided that any components so used shall be left clean with worn and damaged parts replaced and nonpermanent filters renewed and provided that such use shall not shorten guarantee period.
8. Temperatures: Except as otherwise specified, a minimum temperature of 45 degrees F. for building shall be maintained. Ten (10) days prior to and during placing of interior woodwork and other finish work and during all varnishing, painting, etc. (and until substantial completion) provide sufficient heat to insure minimum temperature of not less than 68 degrees F.
9. Operation: Supervise and be responsible for operation of temporary heating system as required by weather and building conditions during regular working hours. Supervision shall also include checking operation at 11 A.M. and 11 P.M. Saturdays, Sundays and holidays. Be responsible for maintenance of heating system during period of construction and do any emergency repair work required during temporary operation.

#### **1.10 TEMPORARY ROOF PROTECTION**

- A. It will be the Contractor's responsibility to coordinate and supervise all roof traffic by construction workers after the installation of roofing has been completed.
- B. If excessive roof traffic is required by other trades, the Contractor will provide suitable rooftop protection for those trades, in the form of approved roof walkways.
- C. The Contractor shall be held responsible for bearing the expense of roofing repairs required due to unprotected areas being damaged by construction workers.

#### **1.11 PROGRESS CLEANING**

- A. Maintain areas free from waste materials, debris, and rubbish. Maintain site in clean and orderly condition.
- B. Provide containers for collection of waste materials, debris, and rubbish; remove and dispose of offsite as required by construction activities.
- C. Periodically clean interior areas to provide suitable conditions for finish work

**END OF SECTION**

**THIS PAGE INTENTIONALLY BLANK**

SECTION 01 50 05  
TEMPORARY UTILITIES

1.1 Description

- A. Temporary utilities: electricity, lighting, heat, ventilation, telephone service, water, sanitary facilities and elevators.

1.2 Temporary Electricity

- A. If any subcontractor contemplates the use of equipment that requires a different voltage or greater capacity than that specified, they shall arrange with the utility for this additional service and pay for installation of the service and the necessary additional switches and wiring required.
- B. Each subcontractor shall provide and pay for installation of temporary service for lighting of their temporary trailer.
- C. The electrical subcontractor shall provide at no cost to other contractors: all lamps, wiring, switches, sockets, and similar equipment required for temporary system until substantial completion. The temporary system shall consist of temporary lighting sufficient to enable all trades to complete their work and to enable the Architect or the Construction Manager to check to check all work as it is being done. Illumination shall, in all area, meet or exceed National Electrical Code requirements.
- D. The Owner will pay for all electrical energy consumed for construction purposes for all trades including that required for operation of ventilating equipment, for heating of buildings, and for testing and operating of all equipment.
- E. All subcontractors shall furnish their own extension cords and lamps other than those furnished for general lighting.
- F. Subcontractors shall be allowed to use the service provided for general lighting and fractional horsepower hand tools at no cost to them.
- G. Exterior lighting for security purposes during construction shall be provided by the electrical subcontractor and coordinated with the Owner and the Construction Manager.
- H. The electrical subcontractor must provide and use G.F.C.I. (ground fault circuit interrupters) as set forth in the latest OSHA regulations 1926 Standards.
- I. After substantial completion of the permanent electrical distribution system and building wiring by the electrical subcontractor, permanent receptacles may be used during finishing work. Permanent wiring for lighting fixtures, switches and receptacles will be installed after all masonry and drywall work is completed. This wiring shall not be used for motors larger than ½ HP or for welding equipment. Circuits for larger motors and welding equipment may be provided with special circuits directly to electrical panels at the expense of subcontractors

requiring them, provided special permission is obtained from the Construction Manager and installation is made by the electrical subcontractor.

- J. The electrical subcontractor is to provide timely delivery and installation of new electrical service equipment to accommodate equipment power requirements.
- K. The electrical subcontractor is to provide temporary power and service to the Construction Manager's job site trailer.
- L. The electrical subcontractor will provide sufficient security lighting around exterior of project.

### 1.3 Cold Weather Protection

- A. All heating and covering required to protect the work from injury due to freezing or moisture during the construction period prior to enclosure of the building shall be classified as Cold Weather Protection. Such protection shall be provided and paid for by each Subcontractor for the protection of his own work until the building is closed.
- B. Heating required to protect materials from injury due to freezing during the construction period prior to enclosure shall be provided by means of portable heating units intended for this purpose.
- C. Proper ventilation must be provided. The use of temporary units whose product of combustion will damage fresh concrete, mortar or other building materials will not be allowed. Use of coke or oil salamanders is prohibited.
- D. If electrical power is required for oil or gas portable heating units, it may be taken from the available temporary power source.
- E. Equipment used for heat as well as the entire surrounding area shall be kept in a clean and safe condition.

### 1.4 Temporary Heat

- A. All heating required after enclosure of the building shall be classified as Temporary Heat.
- B. All temporary heat shall be provided by the Construction Manager as required.
- C. The permanent system will be used as soon as construction allows. Cleaning, maintenance and service of the system during construction is the responsibility of the heating contractor. The warranties for the permanent equipment used during construction will not start until the Owner and Architect approve substantial completion.

### 1.5 Temporary Water

- A. If water cannot be obtained right away, it will be each Subcontractor's responsibility to provide the necessary water for their operation until water is available.
- B. Immediately after award of the contract, the plumbing subcontractor shall make arrangements for temporary water and provide hose bibs in locations specified by the Construction Manager for use by all subcontractors.
- C. The plumbing subcontractor shall maintain the installation and remove it when directed by the Construction Manager. The plumbing subcontractor shall provide necessary patching of surfaces and or the structure after such temporary service is removed.
- D. Subcontractors shall prevent waste of water and shall maintain valves, connections and hoses in good condition at all times. Each subcontractor shall provide his own hose or piping from those bibs.
- E. The owner shall not pay cost of water used.
- F. Each subcontractor shall provide their own drinking water.

#### 1.6 Temporary Toilets

- A. The Construction Manager will provide and maintain exterior sanitary toilets located where required for the force employed.
- B. The plumbing subcontractor, as soon as possible, will provide temporary toilets for use by construction personnel, including both male and female tradespeople.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**



## SECTION 01 50 08 SPECIAL CONDITIONS

### A. General

1. Include all work described in this specification volume to produce the structure and its site appurtenances graphically illustrated on the contract drawings.
2. These Special Conditions are applicable to all divisions and sections of the work included herein, and all Subcontractors and Suppliers must abide by the requirements set forth. The conditions of the Contract, General Conditions, Supplemental Conditions and these Special Conditions shall apply to all subcontractors and suppliers engaged in this work.
3. Each subcontractor or material supplier shall inform themselves as to conditions relating to execution of his work. Neglect of this requirement will not be accepted as cause for additional compensation.
4. The sequence of operations or the place of commencement shall be determined by the Construction Manager as deemed to best serve the needs and convenience of the Owner or as necessity of occasion requires.
5. Where responsibility can be fixed, the cost for any corrective work shall be charged to the party responsible. If responsibility cannot be fixed, the cost shall be prorated among all subcontractors in proportion to their activities on the project at the time the damage was done.

### B. Protection

Each subcontractor shall:

1. Notify the Construction Manager of corporate or private property if their property interferes with the work so that arrangements for proper protection can be made.
2. Provide temporary protection around openings through structural floors and roofs, including elevator openings, stairwells, and edges of slabs.
3. Repair and replace damaged work. If responsibility cannot be determined, the cost of repair or replacement shall be prorated among subcontractors on project.
4. Provide care in work around temporary items installed by the Construction Manager. Damage to same shall be repaired by subcontractor causing damage.
5. Adequately protect surrounding areas and materials, including glass, when welding, flame or abrasive cutting, or other operations requiring the use of flame, arcs, or spraying devices that are necessary in the course of the work. Use only flameproof tarpaulins.
6. WEATHER PROTECTION: Provide protection against rain, snow, wind, ice, storms or heat so as to maintain work, materials, apparatus and fixtures free from

injury or damage. At end of day's work, cover new work likely to be damaged. Remove snow and ice as necessary for safety and proper execution of work.

7. WATER PROTECTION: Protect the work and any associated properties from damage at all times from rain water, ground water, backing up drains or sewers or other water. Provide pumps, equipment and enclosures to provide this protection.
8. PROTECTION OF FINISHED FLOORS: Wheeling loads over a finished floor with or without planks for protection will be not permitted in anything except rubber tired wheelbarrows, buggies, trucks or dollies. This applies to finished floors and to concrete floors, which are not scheduled to be covered with applied surfacing.
9. Assume the responsibility for the protection of all finished construction within the limits of this work as well as along designated haul routes and repair and restore any and all damage to finished work to its original state.
10. PROTECTION OF INSTALLED WORK: Subcontractor shall protect finished floors, stairs, walls, installed products and surfaces from traffic, dust, wear, damage or movement of heavy materials by installing durable sheet materials.
11. REPLACE BROKEN GLASS: In general, glass which is merely cracked will be considered due to faulty setting and shall be replaced by glass and glazing subcontractor.

The Construction Manager will charge cost of replaced glass to subcontractor responsible for damaging glass.

C. Roads

1. Each subcontractor shall be responsible for the necessary cleaning and repairing of adjacent streets resulting from said subcontractor's operations.

D. Use of Site

Each subcontractor shall:

1. Confine their equipment, storage of materials and operations of their tradespeople to limits indicated and shall not bring materials into the site until reasonably required for progress of work. Storage space will be confined to the area of the site or designated storage areas within the facility. No area outside of construction limits or not previously designated may be used for any purpose by subcontractors. This includes storage of direct Owner purchases.
2. Repair damaged areas used for placing of sheds, offices and storage of materials shall be borne by subcontractor responsible for the damage.
3. Assume full responsibility for damage due to the storing of materials. This also includes Owner purchased materials once they are turned over to the respective subcontractors for installation.
4. No use the Owner's existing buildings and facilities except as approved by the

Owner and the Construction Manager for construction purposes.

5. Be responsible for the dewatering and keeping dry of their work area.

E. Verification of Anchor Bolt Locations

1. Prior to starting steel erection, the subcontractor shall verify the dimensional accuracy of all anchor bolt placements. This verification shall be accomplished in time to allow the completion of corrective work without delaying the scheduled erection of structural steel. The subcontractor who installed the anchor bolts shall be responsible for the cost of corrective work.

F. Ventilation

1. Each subcontractor shall be responsible for any ventilation required to complete their work.

G. Openings, Embedments, Supports, Blocking, Backing and Grounds

Each subcontractor shall:

1. Be responsible for providing the blocking, backing and grounds in all walls and above ceilings necessary for the installation of their work.
2. Make suitable preparations for the installation of their work including all piping, conduit, hangers, inserts, anchors, grounds and supports that are to be embedded in concrete, masonry walls, floors, partitions or structural members, or that are to pass through or be attached thereto. Each subcontractor shall provide and install proper sleeves, boxes, receptacles, or chases for all openings or recesses to receive their work occurring in or passing through any such members, all of which shall be located accurately and secured firmly in place before any such masonry has been erected or concrete poured.
3. Furnish and install all anchors, clips, blocking, sleeves, connections, etc., required for attachment of their work to the structure.

H. Access Panels

1. Each subcontractor shall be responsible for furnishing the necessary access panels for items of work installed under their subcontract.
2. Installation of all access panels shall be the responsibility of the subcontractor erecting the wall or ceiling system.
3. If not specified, these access panels shall be approved by the Architect prior to installation.

I. Demolition

1. Rubbish and recycling dumpsters are provided by each Work Package requiring them.

2. The demolition, removal and off-site disposal of all existing buildings (or portions thereof), canopies, retaining walls, pavements, walks and curbs shall be the responsibility of Excavating Contractor. The use of a "wrecking ball" is not permitted. The Excavating Contractor shall be responsible for providing and maintaining temporary protection of all adjacent property.
3. The removal and off-site disposal of all existing roofing, insulation and sheet metal required to complete the new construction shall be the responsibility of Roofing Contractor.
4. The disconnecting, capping, removal, and disposal of all plumbing fixtures, equipment, piping, and supports shall be the responsibility of the Plumbing Contractor.
5. The disconnecting, capping, removal, and disposal of all HVAC equipment, piping, ductwork, and supports shall be the responsibility of the Mechanical Contractor.
6. The disconnecting, capping, removal, and disposal of all Fire Protection equipment, piping, and supports shall be the responsibility of the Fire Protection Contractor.
7. The disconnecting, capping, removal, and off-site disposal of all Electrical equipment, piping, conduit, and supports shall be the responsibility of the Electrical Contractor.
8. All other demolition, removals and disposal, including but not limited to existing doors, windows, borrowed lights, louvers, flooring, ceilings, and partitions, shall be the responsibility of Demolition Contractor. They shall provide and maintain the necessary rubbish removal procedures to facilitate these removals from the existing building. They shall exercise caution to avoid disrupting surrounding surfaces not scheduled for demolition.
9. All materials and equipment obtained from the demolition operations shall belong to the subcontractor performing the demolition unless the Construction Manager notifies subcontractor prior to their removing such material. This material shall then be stored by the subcontractor at an area designated by the Construction Manager.
10. PROTECTION OF INSTALLED WORK: Subcontractor shall protect finished floors, stairs, walls, installed products, and surfaces from traffic, dust, wear, damage, or movement of heavy materials by installing durable sheet materials.

J. Hazardous Materials

1. If hazardous materials are discovered in the execution of work, the following steps are required:
  - a. **Stop work immediately in the area where hazardous material is found.**

b. Notify the Construction Manager immediately.

K. Protection of Existing Facilities

1. Each subcontractor shall provide and maintain proper shoring and bracing for existing underground utilities, sewers, and building foundations encountered during his/her excavation work, to protect them from collapse or other type of damage, until such time as they are to be removed, incorporated into the new work, or can be properly backfilled upon completion of new work.
2. Each subcontractor shall be responsible to provide and maintain protection during site work for all existing lawns, trees, curbs, gutters, drives, walks, and buildings, not noted for removal.
3. Whenever any employee, agent, or other representative of any subcontractor, material person, supplier, or delivery person whose activities on or about the site arises out of the work of the subcontractor, shall cause or be a substantial factor in causing any damage (including but not limited to cracking, gouging, breaking, scratching, marring, puncturing, loosening, weakening, shifting, obstructing, soiling, staining, splattering, wetting, burning, overheating, freezing, exposing, disconnecting, misconnecting, failing to guard or protect, and depriving (of support) to the work, materials or property of a third party (including but not limited to the Owner, other contractors, material people, suppliers, delivery people, frequenters, security holders, adjacent landowners,, utilities or members of the public) subcontractor shall promptly proceed to remedy and correct such damage and pay all cost, expenses, and damages involved.
4. Take all necessary precautions to protect Owner's as well as adjacent property, including trees, shrubs, buildings, sanitary and storm sewers, water piping, gas piping, electric conduit or cable, and other improvements from damage due to work on this project.
5. Repair damaged work outside of property lines in accordance with the requirements of the authority having jurisdiction.
6. Work damaged by failure to provide proper and adequate protection shall be repaired to its original state to the satisfaction of the Owner or removed and replaced with new work at the subcontractor's expense.

Protect trees indicated on the drawings to remain and trees in locations that do not interfere with new construction from damage. Do not injure trunks, branches, or roots of trees that are to remain. Do cutting and trimming only as approved by the Architect.

The replacement cost of trees destroyed or damaged will be charged against the subcontractor responsible for the damage in an amount equal to the expense of trees of similar kind and size.

L. Project Signs

1. Architect and the Construction Manager will provide their own project sign. No individual advertising signs, plaques, or credits, temporary or permanent, will be permitted on building or about premises except name of respective subcontractor on his office or material shed.

**M. Low Voltage and Control Wiring for Hardware**

1. All low voltage and control wiring for hardware to be by the electrical contractor. Refer to hardware schedule(s), door schedule and related specifications.

**N. Occupancy During Construction – Partial Occupancy**

1. In remodeling programs, it is the intention of Owner to carry on all occupancy and activities possible in existing building during period when remodeling construction work is in progress. The contractor shall confer with Owner, schedule work and store materials, so as to interfere as little as possible with use of premises or activities.
2. In event of partial occupancy of new work before substantial completion, cost of temporary utilities, bonds, insurance, retained percentage and responsibility for damages shall be determined by negotiation between Owner, Architect, and Contractors and their sureties.
3. The moving of equipment into a new addition by the Owner or other contractors will not constitute partial occupancy.

**O. Temporary Utilities**

1. The electrical contractor shall expedite the work under his contract in such a manner that the permanent power wiring system and panels will be installed and connected to permanent heating and ventilating equipment in time to operate and test this equipment when the building has been closed sufficiently to permit the use of portion of heating and ventilating system for temporary heating during construction.
2. Permanent wiring and connections may be used at permanent equipment. However, the use of the permanent system during construction shall in no way waive the specified warranty period.

**P. Contractors Training**

1. Each employee must go through safety training and sign the Acknowledgement of Policies and Procedures stating that they understand and will follow safety and work rules.
2. This training will take place once a week at the Construction Manager's jobsite trailer. Subcontract will be notified at pre-install meeting of selected date and time.

END OF SECTION

SECTION 01 51 00  
INDOOR AIR QUALITY

PART 1 – GENERAL

1.1 Related Documents

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Divisions 0 and 1 Specification Sections, apply to this Section.

1.2 Summary

- A. This Section includes requirements for the protection of indoor air quality during construction operations. For compliance with the objectives of indoor air quality, interior finish surfaces and the mechanical system shall also be protected from contamination.
- B. Related Sections include the following:
  - 1. Division 1 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
  - 2. Division 1 Section "Execution Requirements" for progress cleaning requirements.
  - 3. Division 1 Section "Temporary Facilities and Controls" for requirements for partitions isolating construction limits from the remainder of the facility.
  - 4. Division 1 Section "Project Closeout Requirements" for final cleaning requirements.
  - 5. Divisions 2 through 16 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.

1.1 References

Comply with all of the guidelines applicable to Air Quality of each of the following standards. Where guidelines are not in full agreement, comply with the most restrictive:

- 1. ALA. "Guidelines for Design and Construction of Hospitals and Healthcare Facilities," 2001 Edition.
- 2. ASHRAE 62-2001.
- 3. SMACNA "Guidelines for Occupied Buildings Under Construction."
- 4. OSHA 29 CFR.
- 5. Interim Life Safety Requirements of JCAHO and Wisconsin Department of Health Services.

1.2 Submittals

- A. Before commencing with selective removal or construction work, Contractor shall prepare and submit a project specific Interior Air Quality Plan to the Owner's designated representative, receive the Owner's authorizing signature of acceptance, and shall have distributed copies to subcontractors and Architect onsite at the preconstruction meeting. An Interior Air Quality Plan is defined in the SMACNA reference listed in this Section, "REFERENCES". A project specific plan shall be established to protect health of construction workers, occupants in areas affected by construction operations, and occupants of the newly constructed project. The Interior Air Quality Plan shall include drawings indicating specific means and methods of achieving and sustaining control of

- indoor air quality including, procedures for containment, temporary enclosures, isolation vestibules, portable negative air filtration units, and exhaust fans.
- B. Contractor shall initiate and submit an Infection Control Construction Permit for each Work area to Owner's Risk Assessment Coordinator, at least two weeks prior to starting work. Owner's Risk Assessment Coordinator and Contractor shall determine required Interim Infection Control Measures by Class of Precaution. If more than one risk group will be affected, select higher risk group.
  - C. The Contractor shall submit periodic Test Reports summarizing measurements of both air samples and the sustaining of negative air pressure, taken on a periodic basis, as required to test for compliance with the requirements of the Indoor Air Quality Plan.
  - D. The Contractor shall submit monthly reports to the Architect, signed by the Owner, indicating compliance with the project specific Indoor Air Quality Plan along with the Applications for Payment.

## PART 2 - PRODUCTS

### 1.1 Manufacturer's Products

- A. Portable Negative Air Filtration Units: Complete with pre-filters, final filters, pressure gauges and HEPA filtration (99.97% efficient at 0.3 micron particle size). Units shall be DOP tested and certified.
  - 1. Micro-Trap Inc. "MT-C" or approved equal.
- B. Air Pressure Monitor: as required to monitor differential pressure with a range between 0 to 0.5 inches, installed in NEMA rated enclosure, with all necessary wiring, transformers, relays, audio-visual alarm, manual switch, and manual reset switch. Monitor for negative pressure.
- C. Adhesive-Faced Contamination Control Mats with disposable sheets:
  - 1. Liberty Industries, "Tacky Mat" or approve equal.
- D. Temporary Prefabricated units:
  - 1. Fiberlock Technologies, Inc, "Kontrol Kube," including frame #6440, enclosure #6442, platform #6443, 87 CFM vacuum device and manometer, inspection window, and differential porthole.
- E. Polyethylene Sheets: ASTM D 4397, 6 mils thick, fire retardant type, with maximum penneance rating of 0.13 perm.
  - 1. Reef Industries Inc. "Griffolyn #T55 FR" or approved equal.
- F. Vapor-Retarder Tape: Fire retardant, pressure-sensitive tape of type recommended by polyethylene sheet manufacturer for sealing joints and penetrations.
- G. Disinfectant:
  - 1. Rochester Midland "Enviro-Care Neutral Disinfectant" or approved equal.

## PART 3 – EXECUTION

### 3.1 General

- A. This Section includes making all reasonable efforts to protect indoor air quality and air quality of adjacent exterior areas, including but not limited to:
  - 1. Containment Area and Protection Area Controls.
- B. The Owner shall provide the Contractor with an assessment of health risks related to project specific scope to determine which Interim Infection Control Measures need to be complied with.



- C. Contractor shall notify the Owner at least two weeks prior to preparing a Containment Area or starting an activity outside of any Containment Area. Coordinate with Owner the keeping of doors to adjacent occupied spaces closed.
  - 1. Containment Areas: include areas of renovation construction within, or additions to, occupied facilities, adjacent staging and storage areas, and passage areas contractors, supplies and waste; including ceiling spaces above and adjacent to construction.
  - 2. Protection Areas: are interior occupied areas within facilities which are adjacent to Containment Area, either occupied or used for passage, as well as areas connected to construction area by mechanical system air intake, exhaust and ductwork.
- D. Prohibit occupancy of construction areas until completion of Interior Air Quality closeout procedures. Prior to Substantial Completion, submit documentation that the Interior Air Quality Control Plan has been complied with to the Owner's satisfaction including air quality test reports.

### 3.2 Containment Area and Protection Area Controls

- E. Dust-proof temporary partitions of one hour construction, to isolate containment areas from protection areas, are specified in Section 01500. Use specified tape to tightly seal entire perimeter joints.
- F. Access to containment area shall be limited to path determined by Owner's representative.
- G. Install floor mats on both sides of entrances to containment areas. Adhesive walk-off mats shall be placed at all doors exiting the construction area and carpeted walk-off mats shall be placed at all doors entering into a construction area. Carpeted walk-off dust mats shall be vacuumed at least twice per 8-hour shift and at the end of the workday. Any dust tracked outside of the construction area shall be vacuumed or damp-mopped immediately. Vacuum cleaners shall be outfitted with HEPA filters. Adhesive walk-off mats shall be changed daily, or more frequently as required, to maintain adhesive surfaces.
- H. Provide construction signs at entrances to containment area to control access.
- I. Provide isolation vestibules when determined necessary by Owner's Risk Assessment Coordinator. Personnel shall wear protective clothing if required by Owner's Risk Assessment Coordinator. If required, remove protective clothing in isolation vestibule before entering containment areas and put on protective clothing before entering protection area.
- J. Seal return air ducts and all other penetrations of boundary to containment area so they are dust tight.
- K. Store all construction material and equipment within boundary of containment area.
- L. Address required ceiling access in protection areas or occupied areas adjacent to boundaries of containment areas per referenced standards. It is the Contractor's responsibility to determine when a dustproof enclosure is required to protect an adjoining area; however, Contractor shall provide a dustproof enclosure whenever the Owner has identified a need to control airborne contaminants.
  - 1. When a dustproof enclosure is required, provide specified portable polyethylene enclosure and enclosing ladder and seal tight to ceilings, floors and walls with tape until ceiling access is secured.
  - 2. After ceiling access is no longer required, close openings immediately. Also remove polyethylene enclosure, near the end of each day. Thoroughly clean surfaces with Certified HEPA-filtered vacuum cleaners at the end of each day.

3. Protect people below ceiling work, from Contractor's operations including but not limited to falling objects, materials and fluids, as required. Handle fluids with caution. Provide safe working platforms and watertight barriers as required.

### 3.3 Ventilation and Filtration Controls

- A. Sustain negative air pressure of at least 0.01 inch water gauge within areas of construction operations relative to adjacent occupied spaces for 24 hours per day, full duration of construction phase. Connect to emergency power.
- B. Sustain a minimum of six air-changes per hour during installation of wet products such as adhesives, fluid applied coatings, etc.
- C. Ventilate areas of construction operations with 100 percent outside air for full duration of construction phase and as required after occupancy to purge building of residual airborne pollutants and off-gassing of furniture or equipment. Provide required make-up air, tempered and with sustained filtration with HEPA (99.97% efficient at 0.3 micron particle size) to avoid moisture of pollutants. Locate make-up air intakes to avoid polluted air. Provide local dedicated exhaust for high emission activities such as welding, roofing, etc.
- D. Re-circulation of air is prohibited within areas of construction operations for full duration of the project construction phase unless HEPA filtration (99.97%) efficient at 0.3 micron particle size) is sustained.
- E. Use direct exhaust fans that discharge to exterior of building(s) and filter air using 30% minimum filtration equipment specifically designed for this purpose. Exhaust shall not discharge near doors, operable windows, air intakes, or pedestrian walkways or gathering spaces.
- F. Mitigate emissions from Volatile Organic Compounds with activated carbon filtration if required.
- G. Replace filters as required to sustain effectiveness.

### 3.4 Source Controls

- A. Minimize emissions from VOC (Volatile Organic Compounds).
- B. Minimize generation of dust.
- C. Minimize off-gassing by factory aging of manufactured wood products, sheet goods, furniture and equipment, etc.
- D. Schedule dry-out times of products per manufacturer's recommendations.
- E. Prevent dampness within limits of construction.
- F. Use polyethylene moisture protection for materials stored or installed onsite that would otherwise have the propensity to absorb water.
- G. Sequence installation of fluid applied finish materials and adhesives early in the construction process. Install carpet and acoustical ceilings prior to the commissioning of the final building HVAC system.
- H. Remove selective removal material and dust in tightly sealed dump carts.
- I. Thoroughly clean surfaces with Certified HEPA-filtered vacuum cleaners.
- J. Remedy any biological contamination within limits of construction with specified disinfectant.

END OF SECTION

SECTION 01 52 50  
CONSTRUCTION AIDS

1.1 Stairs, Ladders, Ramps, Runways, Scaffolds

- A. The subcontractor performing the work shall:
  - 1). Furnish and maintain equipment such as temporary stairs, fixed ladders, ramps, chutes, runways and the like as required for proper execution of work.
  - 2). Subcontractors can use the permanent stair system.
- B. Subcontractors requiring scaffolds shall provide their own and remove them on completion of the work. Underlay interior scaffolds with planking to prevent uprights from resting directly on the slab.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

SECTION 01 53 05  
BARRICADES AND ENCLOSURES

1.1 Temporary Guardrails and Barricades

- A. All protection and safety barricades, devices, covers, etc., including at all roof areas, shall be provided by each subcontractor as it relates to the safe conduct of their work in accordance with all local, state, and federal regulations.

1.2 Temporary Partitions

- A. The Construction Manager shall provide the necessary temporary partitions for the control of dust and personnel. The temporary partitions shall be of metal studs 24" on center with drywall on both sides, running from the floor to the underside of the ceilings structural compartment.

1.3 Temporary Controls

- A. Barriers, fences and enclosures:
  - 1). The Construction Manager shall provide barricades and covered walkways required by governing authorities for protection of public rights-of-way or for access to the building.
  - 2). All subcontractors shall provide whatever items are necessary to protect vehicular traffic, stored materials, existing facilities and adjacent properties from damage due to their demolition or construction operations, or weather.
  - 3). The Construction Manager in agreement with the Owner may install temporary fence around the entire construction site. Any subcontractor removing the fence to complete their work, must move the fence back to its original state at the end of each working day. If an accident occurs at the project because the fence was not properly installed, that subcontractor will be responsible for all costs.
  - 4). The Construction Manager will provide the necessary materials to enclose the building for temporary heat purposes.

1.4 Enclosures

- A. Enclosures shall be provided by the subcontractor whose work requires them.
- B. When directed, move offices into suitable area in building. subcontractors shall provide and locate own office on site as directed by the General Contractor.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

SECTION 01 54 00  
SECURITY

1.1 Watchmen

- A. Watchmen will not be provided by the Owner or the Construction Manager. Each subcontractor shall be responsible for loss or injury to persons or property where his work is involved, and shall provide such watchmen and take such precautionary measures as he may deem necessary.

1.2 Security

- A. Each subcontractor shall be responsible for and make good any loss or damage due to vandalism or robbery during construction.
- B. Each subcontractor shall be responsible for loss or injury to persons or property wherever his work is involved. Each subcontractor should take precautionary measures to secure materials, equipment and finished or in-progress work.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**



## **SECTION 01 56 39**

### **PROTECTION OF EXISTING TREES**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Protect existing trees not designated for removal.
  - 2. Protect and irrigate trees which are to remain during removal of adjacent trees, site work and construction.

##### **1.2 GUARANTEE**

- A. If a tree which is to remain is destroyed or damaged so that, in the judgment of the Landscape Architect, it needs to be replaced, it shall be removed at Contractor's expense.
- B. Damages will be assessed at the rate of Two Hundred Dollars (\$200.00) per inch of circumference at 12 inches above grade for trees with a diameter of 8 inches or less and at
- C. D.B.H. (Diameter at Breast Height) for diameters greater than 8 inches. Monies shall be paid to the Owner

#### **PART 2 - PRODUCTS**

##### **2.1 TREE PROTECTION MATERIALS**

- A. Barricade: Utility type fencing, 6 feet high, as approved by Landscape Architect.
- B. Posts: Metal or wood, sufficient to hold fabric plumb and taut, as approved by Architect.
- C. Anti-desiccant: Manufactured for use on plants. Provide evidence that material can be used on specified trees. Do not use anti-desiccant without approval of Landscape Architect.

#### **PART 3 - EXECUTION**

##### **3.1 CONSTRUCTION REQUIREMENTS**

- A. Protect existing trees from damage or injury.
- B. Permit no traffic, storage, disposal, fires or stockpiling within dripline.
- C. Prevent puddling or continuous running water within dripline.
- D. Earth surface within dripline shall not be changed. Existing mulch layer under trees shall remain.
- E. Exercise extreme care in removing concrete or asphalt within dripline. Paving pieces shall be lifted rather than dragged. Protect surface roots immediately with 4-inch thick layer of chipped mulch.

- F. At start of construction, irrigate trees by means of subsurface pressure injection. Soil within dripline shall be moist to 18 inch depth.
- G. Work within dripline shall be as directed by Architect. Trenching, grading or excavation within dripline shall be done by hand. Pipes shall be jacked or bored. Protect exposed roots with wet burlap.
- H. Clearly mark trees to remain with different colored removable flags.

### **3.2 BARRICADES**

- A. Install barricades around trees to remain.
- B. Locate fence at dripline of tree unless otherwise directed by Architect.
- C. Locate roots before setting posts. Prevent damage to roots.
- D. Space posts approximately 4 feet apart and securely attach fabric.
- E. Barricade shall be plumb, taut and sturdy.
- F. Repair sagging or damaged barricades immediately. Remove barricades upon completion of work.

### **3.3 PRUNING**

- A. Prune only as directed by the Landscape Architect.

## **END OF SECTION**

SECTION 01 59 00  
FIELD OFFICES

1.1 Field Offices

- A. The Construction Manager shall provide and maintain a temporary watertight office for their operations.
- B. Each subcontractor shall provide their own temporary field office and equipment as required. The location will be determined by the Construction Manager.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

**SECTION 01 60 00**  
**PRODUCT REQUIREMENTS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section includes:
  - 1. Products.
  - 2. Transportation and handling.
  - 3. Storage and protection.
  - 4. Reuse of existing materials.
  - 5. Product options.
- B. Related Sections:
  - 1. Section 01 25 00 - Substitution Procedures.

**1.2 PRODUCTS**

- A. Provide interchangeable components by the same manufacturer for identical items.
- B. Do not use products containing asbestos or other known hazardous materials.
- C. Do not reuse materials and equipment removed from existing construction in completed Work, except as specifically permitted by the Contract Documents.

**1.3 TRANSPORTATION AND HANDLING**

- A. Coordinate delivery of Products to prevent conflict with Work and adverse conditions at site.
- B. Transport and handle Products in accordance with manufacturer's instructions.
- C. Promptly inspect shipments to ensure that Products comply with requirements of Contract Documents, are undamaged, and quantities are correct.
- D. Provide equipment and personnel to handle products by methods to prevent damage.

**1.4 STORAGE AND PROTECTION**

- A. Store and protect Products in accordance with manufacturer's instructions with manufacturer's seals and labels intact and legible.
- B. Store Products on site unless prior written approval to store off site has been obtained from Owner.
- C. Store Products subject to damage by elements in weathertight enclosures. Maintain temperature and humidity within ranges required by manufacturer's instructions.
- D. Exterior Storage:
  - 1. Store fabricated Products above ground; prevent soiling and staining.

2. Cover products subject to deterioration with impervious sheet coverings; provide ventilation to prevent condensation.
  3. Store loose granular materials in well drained area on solid surfaces; prevent mixing with foreign matter.
- E. Arrange storage areas to permit access for inspection. Periodically inspect stored products to verify that products are undamaged and in acceptable condition.

## **1.5 PRODUCT OPTIONS**

- A. Products specified by reference standard only:
1. Select any Product meeting the specified standard.
  2. Submit Product Data to substantiate compliance of proposed Product with specified requirements.
- B. Products specified by naming two or more acceptable Products: Select any named Product.
- C. Products specified by stating that the Contract Documents are based on a Product by a single manufacturer followed by the statement "Equivalent products by the following manufacturers are acceptable":
1. Select the specified Product or a Product by a named manufacturer having equivalent or superior characteristics to the specified Product and meeting the requirements of the Contract Documents.
  2. If the specified Product is not selected, submit Product Data to substantiate compliance of proposed Product with specified requirements.
  3. The specified Product establishes the required standard of quality.
- D. Products specified by naming one or more Products followed by "or approved substitute" or similar statement:
1. Submit a substitution request under provisions of Section 01 25 00 – Substitution Procedures for Products not listed.
  2. The specified Product establishes the required standard of quality.
- E. Products specified by naming one or more Products or manufacturers followed by the statement "Substitutions: Under provisions of Division 01 – General Requirements:
1. Submit a substitution request under provisions of Section 01 25 00 – Substitution Procedures for Products not listed.
  2. The specified Product establishes the required standard of quality.
- F. Products specified by naming one Product followed by the statement "Substitutions: Not permitted": Substitutions will not be allowed.
- G. Products specified by required performance or attributes, without naming a manufacturer or Product:
1. Select any Product meeting specified requirements.
  2. Submit Product Data to substantiate compliance of proposed Product with specified requirements.

**END OF SECTION**

SECTION 01 60 05  
MATERIAL AND EQUIPMENT

1.1 Summary

- A. Delivery, storage and handling.

1.2 Products

- A. Products means new material, components, equipment, fixtures and systems forming the work. It does not include machinery or equipment used for the fabrication, conveyance, or installation of the work. Products may also include existing materials or components slated for reuse.
- B. Do not reuse materials or equipment removed from the premises unless specifically permitted or required by the contract documents.
- C. Standardization and uniformity is desired in all parts of the work. Wherever possible provide products of one manufacturer to simplify maintenance and spare parts inventories.

1.3 Transportation and Handling

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to assure 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.

1.4 Storage and Protection

- A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated products, place on sloped supports, above ground.
- C. Provide off-site storage and protection when site does not permit on-site storage or protection.
- D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- E. Store loose granular materials on solid flat surfaces in a well-drained area. Provide no mixing with foreign matter.
- F. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

- G. The Owner assumes no responsibility for materials stored in building or on the site. The subcontractor assumes full responsibility for damage due to the storing of materials. This also includes Owner purchased materials.

END OF SECTION



## SECTION 01 71 00 CLEANING

### 1.1 Description

- A. Work included: Throughout the construction period, maintain the buildings and site in a standard of cleanliness as described in this section.

### 1.2 Cleaning Up

- A. It is the responsibility of each subcontractor to maintain the premises free of accumulations of waste materials, debris and rubbish caused by their operations or the operations of his sub-subcontractors.
- B. Each subcontractor shall remove their rubbish and debris from the building site promptly upon its accumulation, and in no case later than the regular Friday general cleanup.
- C. Remove all debris from pipe chases, plenums, attics, crawl spaces and other closed or remote spaces prior to enclosing the space.
- D. Each subcontractor shall remove all waste materials, rubbish, debris, and mud caused by his/her employees from slab forms prior to the placement of concrete.
- E. Each subcontractor shall be responsible to remove from the site waste materials of suitable size and shape or weight to make use of dumpster type box unreasonable.
- F. The Construction Manager will provide containers for progress cleaning. Each Friday afternoon, and as required by the Construction Manager, each subcontractor shall perform an overall broom cleaning of appropriate areas. Each contractor on site to supply one person at 12:30 for afternoon clean-up.
- G. The Construction Manager will not provide any progress cleaning. All progress cleaning shall be the responsibility of each subcontractor.
- H. If a subcontractor fails to comply with the requirements, the Construction Manager shall perform the necessary clean-up and deduct the cost of such work from the compensation due or to become due said subcontractor.

### 1.3 Final Cleaning

- A. Other subcontractors shall perform a thorough cleaning of work and equipment provided under their contracts.
- B. Each subcontractor shall perform a thorough cleaning of all interior and exterior surfaces exposed to view. Remove temporary labels, spots, soil, stains, and foreign substances. Polish transparent, and glossy surfaces. Wash and polish hard surface floors and bases; vacuum carpeted and soft surfaces. Clean all equipment and fixtures: leave in a sanitary condition. Clean or replace all filters.

Clean roofs, gutters, downspouts, and drainage systems.

- C. If a subcontractor does not remove rubbish or clean the buildings as specified above, the Construction Manager reserves the right to have work done by others. The cost of work done by others will be deducted from monies due the subcontractor involved.

END OF SECTION

## **SECTION 01 73 00**

### **EXECUTION**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

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

##### **1.2 SUMMARY**

- A. Section Includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Installation of the Work.
  - 3. Progress cleaning.
  - 4. Starting and adjusting.
  - 5. Protection of installed construction.

##### **1.3 QUALITY ASSURANCE**

- A. Manufacturer's Installation Instructions:
  - 1. Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

#### **PART 2 - PRODUCTS**

##### **2.1 MATERIALS**

- A. General: Comply with requirements specified in other Sections.
  - 1. For projects requiring compliance and construction practices and procedures, use products for patching that comply with sustainable design requirements.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

#### **PART 3 - EXECUTION**

##### **3.1 EXAMINATION**

- A. Examination and Acceptance of Conditions:
  - 1. Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
    - a. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
    - b. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.

- c. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- B. Written Report:
  - 1. Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
    - a. Description of the Work.
    - b. List of detrimental conditions, including substrates.
    - c. List of unacceptable installation tolerances.
    - d. Recommended corrections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### **3.2 PREPARATION**

- A. Field Measurements:
  - 1. Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Space Requirements:
  - 1. Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. Review of Contract Documents and Field Conditions:
  - 1. Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 01 31 00 - Project Management and Coordination.

### **3.3 INSTALLATION**

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
  - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels.

- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  - 2. Allow for building movement, including thermal expansion and contraction.
  - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Repair or remove and replace damaged, defective, or nonconforming Work.
  - 1. Comply with Section 01 77 00 - Closeout Procedures for repairing or removing and replacing defective Work.

### **3.4      PROGRESS CLEANING**

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F .
  - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
    - a. Use containers intended for holding waste materials of type to be stored.
  - 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 50 00 - Temporary Facilities and Controls.

- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### **3.5 STARTING AND ADJUSTING**

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 - Quality Requirements.

### **3.6 PROTECTION OF INSTALLED CONSTRUCTION**

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

**END OF SECTION**

## SECTION 01 74 19

### CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
  - 1. Salvaging nonhazardous demolition and construction waste.
  - 2. Recycling nonhazardous demolition and construction waste.
  - 3. Disposing of nonhazardous **demolition and construction** waste.
- B. Related Requirements:
  - 1. Section 04 22 00 - "Concrete Masonry Unit" for disposal requirements for masonry waste.
  - 2. Section 04 73 01 - "Manufactured Stone Veneer" for disposal requirements for excess stone and stone waste.
  - 3. Section 31 05 00 - "Common Work Results for Earthwork" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

##### 1.3 DEFINITIONS

- 1. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- 2. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.
- 3. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner's property.
- 4. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- 5. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- 6. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

##### 1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition and construction waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
  - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

## 1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 10 days of date established for the Notice to Proceed.

## 1.6 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. **[Distinguish between demolition and construction waste.]** Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of **[demolition]** **[site-clearing]** **[and]** **[construction]** waste generated by the Work. Use **[Form CWM-1 for construction waste]** **[and]** **[Form CWM-2 for demolition waste]** **<Insert Owner's form designation>**. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Use **[Form CWM-3 for construction waste]** **[and]** **[Form CWM-4 for demolition waste]** **<Insert Owner's form designation>**. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
  - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work in compliance with [Section 024116 "Structure Demolition."] [Section 024119 "Selective Demolition."]
  - 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
  - 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
  - 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
  - 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
  - 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.
- D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there were no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Use **[Form CWM-5 for construction waste]** **[and]** **[Form CWM-6 for demolition waste]** **<Insert Owner's form designation>**. Include the following:
  - 1. Total quantity of waste.
  - 2. Estimated cost of disposal (cost per unit). Include transportation and tipping fees and cost of collection containers and handling for each type of waste.
  - 3. Total cost of disposal (with no waste management).
  - 4. Revenue from salvaged materials.
  - 5. Revenue from recycled materials.
  - 6. Savings in transportation and tipping fees by donating materials.
  - 7. Savings in transportation and tipping fees that are avoided.
  - 8. Handling and transportation costs. Include cost of collection containers for each type of waste.
  - 9. Net additional cost or net savings from waste management plan.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. General: Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including the following:

210011.00

01 74 19 -2

**Construction Waste Management  
And Disposal**



1. Demolition Waste:
  - a. Asphalt paving.
  - b. Concrete.
  - c. Concrete reinforcing steel.
  - d. Brick.
  - e. Concrete masonry units.
  - f. Wood studs.
  - g. Wood joists.
  - h. Plywood and oriented strand board.
  - i. Wood paneling.
  - j. Wood trim.
  - k. Structural and miscellaneous steel.
  - l. Rough hardware.
  - m. Roofing.
  - n. Insulation.
  - o. Doors and frames.
  - p. Door hardware.
  - q. Windows.
  - r. Glazing.
  - s. Metal studs.
  - t. Gypsum board.
  - u. Acoustical tile and panels.
  - v. Carpet.
  - w. Carpet pad.
  - x. Demountable partitions.
  - y. Equipment.
  - z. Cabinets.
  - aa. Plumbing fixtures.
  - bb. Piping.
  - cc. Supports and hangers.
  - dd. Valves.
  - ee. Sprinklers.
  - ff. Mechanical equipment.
  - gg. Refrigerants.
  - hh. Electrical conduit.
  - ii. Copper wiring.
  - jj. Lighting fixtures.
  - kk. Lamps.
  - ll. Ballasts.
  - mm. Electrical devices.
  - nn. Switchgear and panelboards.
  - oo. Transformers.
2. Construction Waste:
  - a. Masonry and CMU.
  - b. Lumber.
  - c. Wood sheet materials.
  - d. Wood trim.
  - e. Metals.
  - f. Roofing.
  - g. Insulation.
  - h. Carpet and pad.
  - i. Gypsum board.
  - j. Piping.
  - k. Electrical conduit.
  - l. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
    - 1) Paper.
    - 2) Cardboard.
    - 3) Boxes.
    - 4) Plastic sheet and film.
    - 5) Polystyrene packaging.
    - 6) Wood crates.

- 7) Wood pallets.
- 8) Plastic pails.
- m. Construction Office Waste: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following construction office waste materials:
  - 1) Paper.
  - 2) Aluminum cans.
  - 3) Glass containers.

## **PART 3 - EXECUTION**

### **3.1 PLAN IMPLEMENTATION**

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
  - 1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
  - 1. Distribute waste management plan to everyone concerned within [three] <Insert number> days of submittal return.
  - 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
  - 2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

### **3.2 SALVAGING DEMOLITION WASTE**

- A. Comply with requirements in Section 024119 "Selective Demolition" for salvaging demolition waste.
- B. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
  - 1. Clean salvaged items.
  - 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
  - 3. Store items in a secure area until installation.
  - 4. Protect items from damage during transport and storage.
  - 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- C. Salvaged Items for Sale and Donation: Not permitted on Project site.
- D. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as follows:
  - 1. Clean salvaged items.
  - 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.

3. Store items in a secure area until delivery to Owner.
  4. Transport items to Owner's storage area [on-site] [off-site] [designated by Owner].
  5. Protect items from damage during transport and storage.
- E. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
- F. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
- G. Plumbing Fixtures: Separate by type and size.
- H. Lighting Fixtures: Separate lamps by type and protect from breakage.
- I. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

### **3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL**

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall be shared equally by Owner and Contractor.
- C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
    - a. Inspect containers and bins for contamination and remove contaminated materials if found.
  2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
  4. Store components off the ground and protect from the weather.
  5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.

### **3.4 RECYCLING DEMOLITION WASTE**

- A. Asphalt Paving: Grind asphalt to maximum 1-1/2-inch (38-mm) size.
  1. Crush asphaltic concrete paving and screen to comply with requirements in Section 312000 "Earth Moving" for use as general fill.
- B. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.
- C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
  1. Pulverize concrete to maximum 1-1/2-inch (38-mm) size.
  2. Crush concrete and screen to comply with requirements in Section 312000 "Earth Moving" for use as satisfactory soil for fill or subbase.
- D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
  1. Pulverize masonry to maximum 1-1/2-inch (38-mm) size.

- a. Crush masonry and screen to comply with requirements in Section 310500 "Common Work Results for Earthwork" for use as general fill.
  - b. Crush masonry and screen to comply with requirements in Section 329300 "Plants" for use as mineral mulch.
- 2. Clean and stack undamaged, whole masonry units on wood pallets.
- E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- F. Metals: Separate metals by type.
  - 1. Structural Steel: Stack members according to size, type of member, and length.
  - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- H. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- I. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
- J. Metal Suspension System: Separate metal members, including trim and other metals from acoustical panels and tile, and sort with other metals.
- K. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
  - 1. Store clean, dry carpet and pad in a closed container or trailer provided by carpet reclamation agency or carpet recycler.
- L. Carpet Tile: Remove debris, trash, and adhesive.
  - 1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by carpet reclamation agency or carpet recycler.
- M. Piping: Reduce piping to straight lengths and store by material and size. Separate supports, hangers, valves, sprinklers, and other components by material and size.
- N. Conduit: Reduce conduit to straight lengths and store by material and size.
- O. Lamps: Separate lamps by type and store according to requirements in 40 CFR 273.

### **3.5 RECYCLING CONSTRUCTION WASTE**

- A. Packaging:
  - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
  - 2. Polystyrene Packaging: Separate and bag materials.
  - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
  - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
  - 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
  - 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
    - a. Comply with requirements in Section 329300 "Plants" for use of clean sawdust as organic mulch.
- C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.
  - a. Comply with requirements in Section 329300 "Plants" for use of clean ground gypsum board as inorganic soil amendment.
- D. Paint: Seal containers and store by type.

### **3.6 DISPOSAL OF WASTE**

- A. General: Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
  1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
  2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. General: Except for items or materials to be salvaged or recycled, remove waste materials and legally dispose of at designated spoil areas on Owner's property.
- C. Burning: Do not burn waste materials.
- D. Burning: Burning of waste materials is permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.

### **END OF SECTION**

**THIS PAGE INTENTIONALLY BLANK**

SECTION 01 75 00  
NO SMOKING AND APPEARANCE OF CLOTHING

1.1 Description

- A. No smoking will be allowed on the project site. There are no exceptions to this rule. Any worker found smoking may be permanently removed from the project at the sole direction of the Construction Manager.
- B. All subcontractors are required to wear long pants, OSHA approved work shoes, and shirts with shirt sleeves. Sleeveless shirts, and pants with holes are not authorized for wear on the Owner's property. Furthermore, inappropriate or offensive clothing, including clothing that bears the advertising, trademarks, or logos of companies that produce tobacco, or alcoholic beverages is not permitted.
- C. The on-site superintendent for the Construction Manager will be the final arbiter on what is considered offensive and reserves the right to remove tradesmen from the project that do not comply with the rules listed above.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**



**SECTION 01 77 00**  
**CLOSEOUT PROCEDURES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Warranties.
  - 4. Final cleaning.
  - 5. Repair of the Work.
- B. Related Requirements:
  - 1. Section 01 78 23 - Operation and Maintenance Data: Operation and maintenance manual requirements.
  - 2. Section 01 78 39 - Project Record Documents: Record Drawings, Record Specifications, and Record Product Data.

**1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at final completion.

**1.4 CLOSEOUT SUBMITTALS**

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

**1.5 MAINTENANCE MATERIAL SUBMITTALS**

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

## **1.6 SUBSTANTIAL COMPLETION PROCEDURES**

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
  - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number.
    - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
  - 5. Submit testing, adjusting, and balancing records.
  - 6. Submit sustainable design submittals not previously submitted.
  - 7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Advise Owner of pending insurance changeover requirements.
  - 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  - 3. Complete startup and testing of systems and equipment.
  - 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
  - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings for Owner reference.
  - 6. Complete final cleaning requirements.
  - 7. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Punch List Review: Submit a written request for Punch List review to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final Punch List review and tests. On receipt of request, Architect will either proceed with Punch List review or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after Punch List review or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
  - 1. Request a second Punch List review when the Work identified in previous Punch List review was incomplete.
  - 2. Results of the completed Punch List review will form the basis of requirements for final completion.

## **1.7 FINAL COMPLETION PROCEDURES**

- A. Submittals Prior to Final Completion: Before requesting final Punch List review for determining final completion, complete the following:
  - 1. Submit a final Application for Payment according to Section 01 29 00 - Payment Procedures.
  - 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion Punch List review of items to be completed or corrected, endorsed and dated by Architect.

Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  4. Submit final completion photographic documentation.
- B. Punch List Review: Submit a written request for final Punch List review to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final Punch List review and tests. On receipt of request, Architect will either proceed with Observation review or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after Punch List review or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Request a final Punch List review when the Work identified in previous observations was incomplete, is completed or corrected.

## **1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)**

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order.
  2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  3. Include the following information at the top of each page:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Contractor.
    - e. Page number.
  4. Submit list of incomplete items in the following format:
    - a. PDF electronic file. Architect will return annotated file.

## **1.9 SUBMITTAL OF PROJECT WARRANTIES**

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
1. Submit on digital media acceptable to Architect.
- E. Warranties in Paper Form:
1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
  2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

- F. Provide additional copies of each warranty to include in operation and maintenance manuals.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

## **PART 3 - EXECUTION**

### **3.1 FINAL CLEANING**

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting Observation for certification of Substantial Completion for entire Project or for a designated portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - d. Remove snow and ice to provide safe access to building.
    - e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    - f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    - g. Sweep concrete floors broom clean in unoccupied spaces.
    - h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
    - i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
    - j. Remove labels that are not permanent.
    - k. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    - l. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
    - m. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
    - n. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter during Punch List review.
    - o. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
    - p. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 50 00 - Temporary Facilities and Controls.

### **3.2 REPAIR OF THE WORK**

- A. Complete repair and restoration operations before requesting Punch List Review for determination of Substantial Completion.
- B. Repair, or remove and replace, defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
  - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
  - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
    - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
  - 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
  - 4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

**END OF SECTION**

**THIS PAGE INTENTIONALLY BLANK**

## **SECTION 01 78 23**

### **OPERATION AND MAINTENANCE DATA**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

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

##### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operation and maintenance documentation directory manuals.
  - 2. Emergency manuals.
  - 3. Systems and equipment operation manuals.
  - 4. Systems and equipment maintenance manuals.
  - 5. Product maintenance manuals.
- B. Related Requirements:
  - 1. Section 01 33 00 - Submittal Procedures: submitting copies of submittals for operation and maintenance manuals.

##### **1.3 DEFINITIONS**

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

##### **1.4 CLOSEOUT SUBMITTALS**

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
  - 1. Architect will comment on whether content of operation and maintenance submittals is acceptable.
  - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operation and maintenance manuals in the following format:
  - 1. Submit on digital media acceptable to Architect and send by email to Architect. Enable reviewer comments on draft submittals.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.
  - 1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

- E. Comply with Section 01 77 00 - Closeout Procedures for schedule for submitting operation and maintenance documentation.

## **1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS**

- A. for each manual type required.
  - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
  - 2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- B. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.
  - 1. Binders: Heavy-duty, three-ring, vinyl-covered, [loose-leaf] [post-type] binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
    - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
    - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name,[ and] subject matter of contents[, and indicate Specification Section number on bottom of spine]. Indicate volume number for multiple-volume sets.
  - 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
  - 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment. Enclose title pages and directories in clear plastic sleeves.
  - 4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
  - 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
    - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

## **1.6 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS**

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
  - 1. Title page.
  - 2. Table of contents.
  - 3. Manual contents.
- B. Title Page: Include the following information:
  - 1. Subject matter included in manual.
  - 2. Name and address of Project.
  - 3. Name and address of Owner.
  - 4. Date of submittal.
  - 5. Name and contact information for Contractor.



6. Name and contact information for Construction Manager.
  7. Name and contact information for Architect.
  8. Name and contact information for Commissioning Authority.
  9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
  10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

## **1.7 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL**

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:
1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
  2. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
  3. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

## **1.8 EMERGENCY MANUALS**

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- B. Content: Organize manual into a separate section for each of the following:
1. Type of emergency.
  2. Emergency instructions.
  3. Emergency procedures.
- C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
1. Fire.
  2. Flood.
  3. Gas leak.
  4. Water leak.
  5. Power failure.
  6. Water outage.
  7. System, subsystem, or equipment failure.
  8. Chemical release or spill.
- D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

- E. Emergency Procedures: Include the following, as applicable:
  - 1. Instructions on stopping.
  - 2. Shutdown instructions for each type of emergency.
  - 3. Operating instructions for conditions outside normal operating limits.
  - 4. Required sequences for electric or electronic systems.
  - 5. Special operating instructions and procedures.

## **1.9 SYSTEMS AND EQUIPMENT OPERATION MANUALS**

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
  - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
  - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
  - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
  - 2. Performance and design criteria if Contractor has delegated design responsibility.
  - 3. Operating standards.
  - 4. Operating procedures.
  - 5. Operating logs.
  - 6. Wiring diagrams.
  - 7. Control diagrams.
  - 8. Piped system diagrams.
  - 9. Precautions against improper use.
  - 10. License requirements including inspection and renewal dates.
- C. Descriptions: Include the following:
  - 1. Product name and model number. Use designations for products indicated on Contract Documents.
  - 2. Manufacturer's name.
  - 3. Equipment identification with serial number of each component.
  - 4. Equipment function.
  - 5. Operating characteristics.
  - 6. Limiting conditions.
  - 7. Performance curves.
  - 8. Engineering data and tests.
  - 9. Complete nomenclature and number of replacement parts.
- D. Operating Procedures: Include the following, as applicable:
  - 1. Startup procedures.
  - 2. Equipment or system break-in procedures.
  - 3. Routine and normal operating instructions.
  - 4. Regulation and control procedures.
  - 5. Instructions on stopping.
  - 6. Normal shutdown instructions.
  - 7. Seasonal and weekend operating instructions.
  - 8. Required sequences for electric or electronic systems.
  - 9. Special operating instructions and procedures.
- E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

## **1.10 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS**

- A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.
  - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
  - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.
- C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
  - 1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
    - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
  - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
  - 3. Identification and nomenclature of parts and components.
  - 4. List of items recommended to be stocked as spare parts.
- E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
  - 1. Test and inspection instructions.
  - 2. Troubleshooting guide.
  - 3. Precautions against improper maintenance.
  - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - 5. Aligning, adjusting, and checking instructions.
  - 6. Demonstration and training video recording, if available.
- F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
  - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
  - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

- I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
  - 1. Include procedures to follow and required notifications for warranty claims.
- J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
  - 1. Do not use original project record documents as part of maintenance manuals.

#### **1.11 PRODUCT MAINTENANCE MANUALS**

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Product Information: Include the following, as applicable:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Color, pattern, and texture.
  - 4. Material and chemical composition.
  - 5. Reordering information for specially manufactured products.
- E. Maintenance Procedures: Include manufacturer's written recommendations and the following:
  - 1. Inspection procedures.
  - 2. Types of cleaning agents to be used and methods of cleaning.
  - 3. List of cleaning agents and methods of cleaning detrimental to product.
  - 4. Schedule for routine cleaning and maintenance.
  - 5. Repair instructions.
- F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
  - 1. Include procedures to follow and required notifications for warranty claims.

#### **PART 2 - PRODUCTS**

Not Used

#### **PART 3 - EXECUTION**

Not Used

**END OF SECTION**

## **SECTION 01 78 39**

### **PROJECT RECORD DOCUMENTS**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

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

##### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for project record documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
  - 4. Miscellaneous Record Submittals.
- B. Related Requirements:
  - 1. Section 01 77 00 - Closeout Procedures for general closeout procedures.
  - 2. Section 01 78 23 - Operation and Maintenance Data for operation and maintenance manual requirements.

##### **1.3 CLOSEOUT SUBMITTALS**

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit one set(s) of marked-up record prints.
  - 2. Number of Copies: Submit copies of Record Drawings as follows:
    - a. Initial Submittal:
      - 1) Submit one paper-copy set(s) of marked-up record prints.
      - 2) Submit PDF electronic files of scanned record prints and one of file prints.
      - 3) Submit record digital data files and one set(s) of plots.
      - 4) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
    - b. Final Submittal:
      - 1) Submit three paper-copy set(s) of marked-up record prints.
      - 2) Submit PDF electronic files of scanned record prints and three set(s) of prints.
      - 3) Print each drawing, whether or not changes and additional information were recorded.
    - c. Final Submittal:
      - 1) Submit one paper-copy set(s) of marked-up record prints.
      - 2) Submit record digital data files and three set(s) of record digital data file plots.
      - 3) Plot each drawing file, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.
  - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

#### **1.4 RECORD DRAWINGS**

- A. Record Drawings: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
  - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Accurately record information in an acceptable drawing technique.
    - c. Record data as soon as possible after obtaining it.
    - d. Record and check the markup before enclosing concealed installations.
    - e. Cross-reference record prints to corresponding photographic documentation.
  - 2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional changes to Drawings.
    - b. Revisions to details shown on Drawings.
    - c. Depths of foundations.
    - d. Revisions to routing of piping and conduits.
    - e. Revisions to electrical circuitry.
    - f. Actual equipment locations.
    - g. Duct size and routing.
    - h. Locations of concealed internal utilities.
    - i. Changes made by Change Order or Work Change Directive.
    - j. Changes made following Architect's written orders.
    - k. Details not on the original Contract Drawings.
    - l. Field records for variable and concealed conditions.
    - m. Record information on the Work that is shown only schematically.
  - 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
  - 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  - 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
  - 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
  - 1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
  - 2. Format: DWG, Microsoft Windows operating system.
  - 3. Format: Annotated PDF electronic file with comment function enabled.
  - 4. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
  - 5. Refer instances of uncertainty to Architect for resolution.
  - 6. Architect will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.
    - a. See Section 01 31 00 - Project Management and Coordination for requirements related to use of Architect's digital data files.
    - b. Architect will provide data file layer information. Record markups in separate layers.

- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
  - 1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  - 2. Format: Annotated PDF electronic file with comment function enabled.
  - 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
  - 4. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

## **1.5 RECORD SPECIFICATIONS**

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
  - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
  - 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
  - 5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.
- B. Format: Submit record Specifications as annotated PDF electronic file.

## **1.6 RECORD PRODUCT DATA**

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
  - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  - 3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.
- C. Format: Submit record Product Data as annotated PDF electronic file.
  - 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

## **1.7 MISCELLANEOUS RECORD SUBMITTALS**

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file of marked-up miscellaneous record submittals.

1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

## **1.8 MAINTENANCE OF RECORD DOCUMENTS**

- A. Maintenance of Record Documents: Store record documents in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

## **PART 2 - PRODUCTS**

Not Used

## **PART 3 - EXECUTION**

Not Used

**END OF SECTION**



## **SECTION 02 41 13**

### **DEMOLITION**

#### **PART 1 - GENERAL**

##### **1.01 SCOPE**

- A. The work under this section shall consist of providing all work, materials, labor, equipment, and supervision necessary to provide for the demolition of site work and such features as required in these specifications and on the drawings. Included are the following topics:

PART 1 - GENERAL

Scope  
Related Work  
Submittals  
Record Drawings  
Safety  
Permits  
Disconnection of Services  
Provisions for Future Work  
Removal/Salvaging of Items  
Owner Salvaged or Removed Materials

PART 2 - MATERIALS

Equipment

PART 3 - EXECUTION

Protection of Existing Work and Facilities  
Demolition  
Building Demolition  
Demolition below Grade  
Demolition Backfill  
Drain Tile  
Transportation and Disposal of Demolition Waste

##### **1.02 RELATED WORK**

- A. Applicable provisions of the General Conditions and Division 01 shall govern work under this section.

Section 31 25 00 - Erosion Control

##### **1.03 SUBMITTALS**

- A. For utilities or other services requiring removal or abandonment in-place, submit materials documenting completion of such work.
- B. Submit record drawings.
- C. Submit copies of records documenting recycling or disposal of demolition materials from the site.

##### **1.04 RECORD DRAWINGS**

- A. Maintain record drawings showing actual locations of utilities and other features encountered, and any deviations from the original design. Show actual limits of removal and demolition.

##### **1.05 SAFETY**

- A. Verify that all gas and electrical utilities have been abandoned or disconnected and associated hazards mitigated, prior to beginning any demolition.

- B. Take all necessary precautions while dismantling piping containing gas, gasoline, oil or other explosive or toxic fluids or gases. Purge lines and contain materials in accordance with all applicable regulations. Store such piping outdoors until fumes are removed.
- C. Maintain a clean and orderly site. Remove debris at end of each workday.
- D. Burning of debris is not permitted.
- E. If hazardous materials are not anticipated, but encountered, terminate operations and contact the Construction Representative immediately. Follow all applicable local, state and federal regulations pertaining to hazardous materials.

#### **1.06 PERMITS**

- A. Unless otherwise noted, Contractor shall be responsible for obtaining and paying for all permits necessary to complete demolition work.
- B. If necessary, file and maintain Notification of Demolition and/or Renovation and Application for Permit Exemption (WDNR Form 4500-113) in accordance with the Wisconsin Department of Safety and Professional Services Administrative Code Chapter NR447

#### **1.07 DISCONNECTION OF SERVICES**

- A. Prior to starting removal and/or demolition operations be responsible and coordinate disconnection of all existing utilities, communication systems, alarm systems and other services.
- B. Existing public Gas & Electric services shall be disconnected and abandoned properly by WE Energies. Contractor shall coordinate and assist as required.
- C. Existing water services not planned for reuse shall be excavated at the main and disconnected at the corp stop.
- D. Existing sanitary lateral connections not planned for re-use shall be cut-out at the main and replaced with a new pipe section (removing existing WYE fitting).
- E. Disconnect all services in manner which insures continued operation in facilities not scheduled for demolition.
- F. Disconnect all services in manner which allows for future connection to that service.
- G. Disconnect services to equipment at unions, flanges, valves, or fittings wherever possible.

#### **1.08 REMOVAL/SALVAGING OF ITEMS**

- A. Carefully remove all items that are scheduled to be salvaged.
- B. Secure salvaged items to allow for future movement; provide pallets, skids and other devices as necessary. Secure all loose parts.
- C. Provide crates, padding, tarps and other measures necessary to protect salvaged items during storage. Store items in secure location, safe from vandalism, weather, dust and other adverse elements.
- D. Where salvaged items are indicated to be turned over to Owner, deliver to location on property where designated by Owner.
- E. Where indicated to be incorporated into new work, store the salvaged item in secure location until trade responsible for re-installation mobilizes his equipment and storage facilities to the site, or otherwise accepts responsibility for the salvaged item.

## **PART 2 - MATERIALS**

### **2.01 EQUIPMENT**

- A. Use Contractor's normal equipment for demolition purposes and which meets all safety requirements imposed on such equipment.

## **PART 3 - EXECUTION**

### **3.01 PROTECTION OF EXISTING WORK AND FACILITIES**

- A. Take all measures necessary to safeguard all existing work and facilities which are outside the limits of the work.
- B. Furnish and install fencing or other barriers as shown on the plans or as otherwise necessary to protect existing features.
- C. Verify the locations of, and protect, any buildings, structures, utilities, paved surfaces, signs, streetlights, utilities, landscaping and all other such facilities that are intended to remain or be salvaged.
- D. Make such explorations and probes as necessary to ascertain any required protection measures that shall be used before proceeding with demolition.
- E. Provide and maintain adequate catch platforms, warning lights, barricades, guards, weather protection, dust protection, fences, planking, bracing, shoring, piling, signs, and other items required for proper protection. Provide protection for workmen, public, adjacent construction and occupants of existing building(s).
- F. Report damage of any facilities or items scheduled for salvaging to the Construction Representative.
- G. Repair or replace any damaged facilities that are not scheduled for demolition.
- H. Explosives shall not be used for demolition.
- I. Keep streets, walks and all other adjacent paved areas clean and swept clear of dirt, mud and debris deposited as a result of this operation.
- J. Protect surrounding area from dust. Control rodents, and other vermin associated with demolition operations.

### **3.02 DEMOLITION**

- A. Remove all equipment, fixtures and other materials scheduled for salvage prior to beginning demolition operations.
- B. Demolish and remove all buildings and structures scheduled for demolition as shown on the plans.
- C. Abandon gas, electric and communication utilities in accordance with local utility company requirements, or applicable substantive requirements if considered private.
- D. Carry out vehicle loading as necessary within the project boundaries or as defined or indicated on the drawings, but not in locations that block vehicular traffic on the streets or pedestrian traffic on adjacent public walks.
- E. Dismantle each structure in an orderly manner to provide complete stability of the structure at all times. Provide bracing and shoring where necessary to avoid premature collapse of structure.

- F. Conduct demolition operations and the removal of rubbish and debris in such a way that a minimum of nuisance dust is caused. Constantly sprinkle rubbish and debris with water if necessary to keep nuisance dust to a minimum.
- G. Where necessary to prevent collapse of any construction, install temporary shores, underpinning, struts or bracing. Do not commence demolition work until all temporary construction is complete.
- H. During the execution of the work, provide, operate, and maintain all pumping equipment, suction and discharge lines in a number of capacity as required to keep all cellars and pits free of water from any source whatsoever at all times.
- I. Masonry and concrete shall be demolished in small sections. Use braces and shores as necessary to support the structure of the building or structure and protect it from damage. Where limits of demolition are exposed in the finished work, cutting shall be made with saws, providing an absolutely straight line, plumb, true and square.
- J. Operate equipment so as to cause a minimum of damage to plaster which is to remain, and so as to keep dust and dirt to a minimum.

### **3.03 DEMOLITION BELOW GRADE**

- A. Demolish foundation walls and other below grade features in accordance with the plans. Unless otherwise noted, remove all below grade features to a point 4' below adjoining existing grade, or proposed grade, whichever is lower. Basement and/or lowest level floors more than 4' below existing grade need not be removed, but must be broken up to permit drainage. Refer to structural requirements for areas within new building footprints.

### **3.04 DEMOLITION BACKFILL**

- A. Backfill and compact below grade areas and voids resulting from demolition of structures and other abandonment and demolition.
- B. Backfilling shall not begin until demolition and abandonment has been approved and documented by the Construction Representative.
- C. Prior to placement of fill materials, ensure that areas to be filled are free of standing water, frost, frozen materials, trash and debris.
- D. Backfill type, lift thickness and compaction requirements shall be in accordance with Section 31 05 00 - Common Work Results for Earthwork (Outside the Building Footprint).

### **3.05 DRAIN TILE**

- A. Carefully protect and/or replace drain tiles encountered during demolition which are necessary to maintain site drainage conditions. Immediately repair or replace any drain tiles not scheduled for demolition, but damaged. Report damage to the Construction Representative. Repairs to drain tile or replacement drain tile shall be comparable or better than the existing drain tile system.
- B. Test drain lines with water to assure free flow before covering. Remove all obstructions which may be found, retest until satisfactory.
- C. Repairs to drain tile or replacement drain tile shall be comparable or better than the existing drain tile system.

### **3.06 TRANSPORTATION AND DISPOSAL OF DEMOLITION WASTE**

- A. Transport and dispose all demolition waste in accordance with local, state, and federal guidelines.

- B. Whenever possible, or otherwise required by the Contract Documents, recycle demolition waste.
- C. Demolition waste shall be disposed of at a landfill or dumpsite designed and approved to accept the given waste.
- D. Maintain records documenting recycling and disposal of demolition waste. Record description of material, date removed, quantity removed, method of transport and recycling/disposal destination.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

**SECTION 03 10 00**  
**CONCRETE FORMWORK**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

- A. Work Included:
  - 1. Furnish and install temporary formwork and shoring for all cast-in-place concrete including all work, materials, labor, equipment and supervision.
  - 2. Provide box-outs and openings for other trades.
  - 3. Furnish and install dovetail slots, anchor inserts and waterstops.
  - 4. Install anchor bolts, plates and inserts furnished by other trades.
  - 5. Removal of all temporary formwork and shoring.
- B. Related Work Specified Elsewhere:
  - 1. Finished concrete tolerances and surface irregularities: Section 03 30 00 - Cast-in-Place Concrete.
  - 2. Concrete reinforcement and concrete accessories: Section 03 20 00 - Concrete Reinforcement.
  - 3. Concrete: Section 03 30 00 - Cast-in-Place Concrete.
  - 4. Post-Installed Anchors - Section 05 05 19.
  - 5. Furnishing and installation of conduit and pipes to be embedded in concrete: Respective sections of Divisions 22, 26 and 27.

**1.02 QUALITY ASSURANCE**

- A. All work shall be in accordance with applicable manufacturer's and supplier's instructions.
- B. Applicable Specifications: Latest issue of following specifications and recommended practices shall become part of this specification as if written herein. Wherever requirements conflict, the more stringent shall govern.
  - 1. "Forms for Architectural Concrete", published by Portland Cement Association
  - 2. ACI 301 "Specifications for Structural Concrete for Buildings"
  - 3. ACI 117 "Specification for Tolerances for Concrete Construction and Materials and Commentary"
  - 4. ACI 347R "Guide to Formwork for Concrete"
  - 5. ACI 347.2R "Guide for Shoring/Reshoring Concrete Multistory Buildings"
  - 6. ACI 347.3R "Guide to Formed Concrete Surfaces"
  - 7. "National Design Specification for Wood Construction and Supplement," National Forest Products Association (NFPA)
  - 8. "Plywood Design Specification," American Plywood Association (APA)
  - 9. OSHA Standard "Safety and Health Regulations for Construction, Part 1926, subpart Q: "Concrete and Masonry Construction"
  - 10. ANSI A10.9, "Safety Requirements for Concrete Construction and Masonry Work"
  - 11. Specifications cited in Section 03 30 00
- C. Design:
  - 1. Contractor shall be responsible for the design, engineering, construction, shoring and reshoring of all concrete formwork and bracing as required by Specification Section 03 30 00 and ACI 347, "Recommended Practice for Concrete Formwork". Wherever requirements conflict, the more stringent shall govern.
  - 2. Design forms, shores and bracing to withstand all the following:
    - a. Fluid Pressures: 150 lbs. per cubic foot.
    - b. Live-Load Allowance: 50 lbs. per square foot of horizontal surface. (75 psf if motorized carts are used.)
    - c. Impact of placing, vibrating, rodding and moving of workers, materials and equipment.
    - d. Structural stability, including bracing for gravity and wind effects.

- e. Any other loads, e.g., equipment loads, wind loads, height of concrete drop, vibrations, etc.
  - f. Design formwork to prevent leakage of concrete.
- D. Qualified workers shall be on duty during placing of concrete to correct faulty formwork and insure that there is no movement of shores, braces or other supports. Contractor shall be responsible for adequate design and construction of all forms wherever load on forms exceeds 150 lbs. per square foot, where power buggies are used or two (2) stage shores are used.
- E. Allowable Tolerances: Construct formwork to provide completed cast-in-place concrete surfaces complying with the tolerances specified in Article entitled "Tolerances" in Section 03 30 00. Select formwork to produce finish specified. See Architectural documents for concrete finishes. Where finish is not specified:
  - 1. Formwork and surface irregularities for exposed surfaces shall conform to ACI 117, Class B and ACI 347.3R CSC3, except interior basement walls in parking areas may conform to ACI 117 Class C and ACI 347.3R CSC2. A surface is considered exposed if the concrete texture can be seen in the completed structure.
  - 2. Formwork and surface irregularities for other surfaces shall conform to ACI 117, Class C and ACI 347.3R CSC2.
  - 3. Provide smooth form finish on the exterior face of walls (e.g. basements and tunnels) to receive membrane waterproofing. Coordinate finish requirements with waterproofing installer.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. Wood Forms:
  - 1. Unexposed Surfaces: No. 2 Grade or better lumber.
  - 2. Exposed Surfaces: Plywood or with linings as specified: On walls, plywood forms shall be large sheets symmetrically arranged.
- B. Plywood: APA Grade B-B, Plyform, Class 1: Exterior conforming to U.S.P.S. 1: Minimum five (5) ply 5/8" thick.
- C. Form Lining:
  - 1. Plywood: HDO-Ext-DFPA, Group 5, 5/16" thick (with high density overlay).
  - 2. Fiberboard: Treated, hardpressed fiberboard having low degree of water absorptivity: 3/16" thick: one (1) side smooth.
- D. Form Ties: Approved devices for internal ties for wood or metal forms, arranged that no metal will be within 1" (2.5 cm) of any finished surface.
  - 1. For exposed concrete, ties shall be snap off type (break point 1" or more from surface) with plastic cones added to form a 1-1/4" dia., 1-1/2" deep recess around tie which shall be grouted flush to match adjacent concrete surface. Provide form-release agent with rust inhibitor for steel form-facing materials.
  - 2. No wire ties or site fabricated ties permitted.
  - 3. Furnish ties with integral water-barrier plates to walls indicated to receive damp-proofing or water-proofing.
- E. Form Coatings:
  - 1. Provide commercial formulation form-coating compounds that will not absorb moisture, bond with, stain or adversely affect concrete surfaces and will not impair subsequent treatment of concrete surfaces requiring bond or adhesion or impede the wetting of surfaces to be cured with curing compound. Provide form-release agent with rust inhibitor for steel forms.
- F. Metal Forms: As approved, producing surfaces equal to wood forms.



- G. Cylindrical Fiber Forms: Round section fiber form with proprietary interior coating for smooth, seamless, column surfaces. Use wherever columns are exposed.
  - 1. "Sonotube" Smooth Fiber Form
  - 2. Approved equal.
- H. Corrugated Paper Form Materials: Corrugated paper void form materials and accessories to create a temporary support for the placement of concrete (e.g. grade beams) over soils, with moisture resistant exterior, installed per manufacturer's recommendations.
  - 1. "Wall Void, Form Void, Trench Void, Trap Void, Column Wrap, Arc Void, Seam Pads and End Caps", Sure Void Products, Inc., Englewood, CO
  - 2. "Beam Void", Void Form International Ltd., Winnipeg, Manitoba
- I. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- J. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

### **PART 3 - EXECUTION**

#### **3.01 ERECTION**

- A. General:
  - 1. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.
  - 2. Erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by the concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.
  - 3. Construct forms to sizes, shapes, lines and dimensions shown and to obtain accurate alignment, location and grades. Level and plumb work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste. Secure against warping, bulging and deflection.
  - 4. Set and maintain designated lines until concrete has set.
  - 5. Provide vertical supports of adequate strength to carry all loads.
  - 6. Support shores resting on ground or mud sills of proper size and design to prevent settlement. If suitable mud sills cannot be installed, furnish truss supports for forms.
  - 7. Do not set shores or forms on frozen ground.
  - 8. Arrange braces and ties to permit tightening and bracing while pouring concrete so as to avoid bulging or deflection.
  - 9. Remove all fasteners and thoroughly clean all forms intended for re-use. Keep in good condition as to accuracy, shape and strength.
  - 10. Fabricate forms for easy removal without hammering or prying against the concrete surfaces. Provide crush plates or wrecking plates where stripping may damage concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses and the like to prevent swelling and for easy removal.
  - 11. Formwork for Grade Beams and Footings: Side forms are required.
  - 12. Construction joints shall only be installed at locations approved by Structural Engineer.
  - 13. Chamfers: Chamfer exposed corners and edges of exposed to view structural elements, including columns, walls and beams, fabricated to produce uniform smooth lines and tight edge joints. Chamfer corners of exterior walls to receive membrane waterproofing.
  - 14. Built-in Work: Build into construction all wall ties, anchors, dowels, inserts, wood blocks, nailing strips, grounds, anchor slots, reglets, as required. Set all anchors, in forms as furnished and located by other trades or other Contractors for support of various items of work. "Box-outs" shall be provided by this Contractor. Have all locations approved and verified after placement by each respective Contractor.
    - a. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts and other features required in work.
  - 15. Before concrete placement, check the lines and levels of erected formwork. Make corrections and adjustments to ensure proper size and location of concrete members and

stability of forming system. During concrete placement, check formwork and related supports to ensure that forms are not displaced and that completed work will be within specified tolerances and finish.

- B. Lined forms shall be used for exposed face of all walls and other surfaces.
1. Backing for form lining shall be a good grade of form lumber, solid, straight and free from defects that impair its strength but need not be quality used in contact forms.
  2. Form sheathing shall be securely nailed to stud, and edges of board shall be in contact to prevent bulging of lining.
  3. Nail form lining securely to form sheathing. All lining shall be used in as wide of pieces as possible. Areas 4'0" or less shall be lined in a single width.
  4. Joints in lining and backing shall not occur at the same place, and abutting edges of adjacent sheets shall be nailed to the same board.
  5. Lining material shall be nailed to backing beginning at center of board and working toward edges to prevent buckling.
  6. Nails shall be three (3) Penny Blue Shingle Nails with tin, flat heads, spaced 8" along edges. There shall be at least one (1) nail for each square foot (900 cm<sup>2</sup>) of surface.
  7. Fiberboard shall be thoroughly wet with water applied to screen side at least 12 hours before using. Board shall be stacked screen side to screen side.
  8. Lining material may be reused if in satisfactory condition and approved by Architect.
- C. Cleanouts: Provide cleanouts at bottom and proper intervals of wall, beam and girder forms and column bottoms. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.
- D. Metal Forms:
1. Of design and thickness meeting design strength requirements.
  2. Must line up accurately and present a uniformly smooth surface.
  3. Clamps, pins or connecting devices designed to hold forms rigidly together and allow removal without injury to concrete.
  4. Keep forms free from rust, grease or other foreign matter that discolors concrete.
- E. Cylindrical Fiber Forms: Install in accordance with manufacturer's recommendations.
- F. Form Coatings:
1. Coat form contact surfaces with form-coating compound before reinforcement is placed. Do not allow excess form coating material to accumulate in the forms or to come into contact with surfaces which will be bonded to fresh concrete, including reinforcing steel and waterstops. Apply in compliance with manufacturer's instructions and comply with EPA/OSHA. Coat steel forms with a non-staining, rust preventative form oil or otherwise protect against rusting. Rust stained steel formwork is not acceptable.
- G. Alignment: After concrete is placed and before initial set, true forms to line and level by means of adjustable shores, jacks, shims or other approved method. If bulging, sagging or deflection cannot be corrected to satisfaction of Architect, they must be removed immediately, forms reset and braced against further movement.
- H. Slots, chases, recesses, keys, etc. constructed as shown on drawings and as required by work of other trades. Build bulkheads with keys in walls and footings for stopping concrete. Box out for all permanent and temporary openings, such as hoists, shafts, etc. Build forms to seal up when and as required.
- I. Install ties so portion remaining within concrete after removal is at least 1" inside concrete and will not leave holes larger than 1" diameter. Remove so that after removal surrounding concrete is not disfigured and cleanout hole remains to be patched.
- J. Joints and Edge Forms:
1. Locate construction joints as shown on drawings or as approved by the Engineer. Form with keyway. Place perpendicular to main reinforcement. Continue reinforcement through

- joint, except slabs-on-grade, and locate joint so as not to affect structural integrity or appearance of the structure.
2. Set edge forms or bulkheads and intermediate screed strips for slabs to obtain the required elevations and contours in the finished slab surface. Provide and secure units of sufficient strength to support the types of screeds required. Align the concrete surface to the elevation of the screed strips by the use of the strike-off templates or accepted compacting type screeds.

### 3.02 REMOVAL OF FORMS

- A. Remove in such a manner and at such time as to insure complete safety of structure and prevent damage to concrete surfaces.
- B. In no case shall supporting forms or shoring be removed until members have acquired sufficient strength to safely support their weight and load thereon. Coordinate removal with work of other trades. Maintain curing and protection after removal of formwork.

Strength of concrete shall be established by site cured test cylinders. If stripping is to occur before standard cylinder test reports as specified in Section 03 30 00 are available, additional cylinders shall be taken for this purpose at the expense of the Contractor. Coordinate concrete mix design with stripping requirements.

Contractor shall provide special insulated curing boxes for the storage of the concrete test cylinders. These boxes shall have holes to prevent heat build-up. The test cylinders shall be cured on the top of the poured slab.

- C. Remove forms according to ACI-347. Do not remove forms until concrete has attained 80 percent of minimum design strength, except where 100 percent is indicated. If field cured cylinders are not prepared to determine concrete strength, then the following schedule shall govern the minimum waiting period after placing concrete before bottom forms, and shores of similar falsework supporting flexural members such as girders, beams, joists, slabs, etc. may be disturbed or stripped:

<u>Structural Members</u>	<u>Waiting Period</u>
Walls (less than 2'-0" thick), columns	12 hours

Above schedule applies to daily curing temperatures above 50 degrees. For lower daily curing temperatures, increase waiting period. Above schedule does not apply to mass concrete.

### 3.03 FORM RE-USE

- A. Clean, remove laitance and repair surfaces of forms to be re-used in the Work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. Align and secure joints to avoid offsets and tighten to close all joints.
- B. Apply new form coating compound material to concrete contact surfaces as specified for successive concrete placement.
- C. Do not use "patched" forms for exposed concrete surfaces.

### 3.04 REPAIRS

- A. After stripping forms for all ceiling, slab edge, wall and column surfaces, this Contractor shall remove all nails, fins, protrusions and form materials.

### 3.05 WEATHER PROTECTION

- A. Form work protection and shelters shall conform to the Cold and Hot Weather Requirements of Section 03 30 00.

END OF SECTION

**SECTION 03 20 00**  
**REINFORCING STEEL**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

- A. Work Included: Provide work, labor, materials, equipment and supervision necessary to complete all concrete or masonry reinforcing steel for all site cast concrete.
- B. Related Work Specified Elsewhere:
  - 1. Concrete Formwork - Section 03 10 00
  - 2. Cast-in-Place Concrete - Section 03 30 00
  - 3. Unit Masonry - Section 04 20 00

**1.02 QUALITY ASSURANCE**

- A. Reference Standards: The following latest edition reference specifications shall become a part of this specification as if written herein. If provisions of reference standards and this Section conflict, the more stringent provisions shall govern.

ACI SP-66 - ACI Detailing Manual

ACI 117 - Standard Tolerances for Concrete Construction and Materials

ACI 301 - Specifications for Structural Concrete

ACI 315 - Manual of Standard Practice for Details and Detailing of Concrete Reinforcement

ACI 318 - Building Code Requirements for Reinforced Concrete

ACI 544.3R - Guide for Specifying, Proportioning and Production of Fiber Reinforced Concrete

AWS D1.4 - Structural Welding Code - Reinforcing Steel

ASTM A82 - Standard Specification for Cold-Drawn Steel Wire for Concrete Reinforcement

ASTM A185 - Standard Specification for Welded Steel Wire Reinforcement for Concrete Reinforcement

ASTM A615 - Standard Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement

ASTM A706 - Standard Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement

ASTM A775 - Standard Specification for Epoxy-Coated Reinforcing Steel Bars

ASTM A884 - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement

ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete

ASTM D3963 - Standard Specification for Fabrication and Jobsite Handling of Epoxy Coated Reinforcing Steel Bars

CRSI DA4 - Manual of Standard Practice

CRSI P1 - Placing Reinforcing Bars

CRSI 63 - Recommended Practice for Reinforcing Materials Bars

CRSI 65 - Recommended Practice for Placing Bar Supports, Specification and Nomenclature

- B. Reinforcing Steel Detailer: Minimum of five (5) years' experience preparing and detailing reinforcing shop drawings on projects of comparable size and complexity, with demonstrated understanding of CRSI and ACI Standards for detailing, bar supports and lap lengths.
- C. Reinforcing Steel Installer: Minimum of five (5) years' experience installing steel on projects of comparable size and complexity.
- D. Unacceptable Workmanship: Reinforcement with any of the following defects will not be permitted in the work:
  - 1. Bar lengths, depths and bends exceeding specified fabrication tolerances.
  - 2. Bends or kinks not indicated on Drawings or final Shop Drawings.
  - 3. Bars with reduced cross section due to excessive rusting or other cause.
- E. Epoxy-coated reinforcing suppliers shall participate in the "CRSI Fusion Bonded Epoxy Coating Applicator Certification Program."
- F. Inspection Service: Contractor shall engage an Inspection Service (e.g., Material Testing Agency) for all reinforcing bar inspections during construction for reinforced concrete and masonry.
  - 1. Inspector shall have experience in concrete reinforcing bar inspections and be knowledgeable regarding ACI requirements. Certification as a Reinforced Concrete Inspector by the ACI certification program, or other accepted organization, meets the experience requirement. Inspector shall be thoroughly familiar with plans, sections, shop drawings and specification. Provide qualifications to Structural Engineer for review.
  - 2. Notify Architect, Structural Engineer, and Reinforcing Bar Inspector at least 7 days prior to concrete pour.
  - 3. Inspector shall verify reinforcing bar size, number and spacing, clear cover, splice locations and laps, special details and conformance to the Design Documents.
  - 4. Frequency of Inspections: All rebar shall be inspected. All reinforcing bars shall be in place for an inspection prior to a concrete pour or masonry grouting.
  - 5. Structural Engineer will be notified immediately if any deficiencies are encountered.
  - 6. No concrete or grout shall be poured until all corrections identified by the Inspector or Structural Engineer have been made and re-inspected.
  - 7. Inspector shall submit inspection reports to Structural Engineer.

**1.03 SUBMITTALS**

- A. Shop Drawings for reinforced concrete and masonry (CMU) construction showing dimensions, bar schedules, concrete cover, lap requirements, bending details, stirrup spacing, location of any mechanical, plumbing or electrical openings and all other details shall be submitted for approval before beginning of fabrication of reinforcing materials in accord with requirements of General Conditions.
  - 1. Provide reinforcing steel placing drawings (shop drawings) in conformance with the ACI Detailing Manual, ACI 315, CRSI Standards and any additional requirements of this specification.
  - 2. For all reinforced slabs, including slabs on metal deck or on precast plank, beams and joists, provide a rebar support plan. Show and specify all slab bolsters, high chairs, support bars and their spacing.
  - 3. Provide elevation views of all reinforced walls; indicate top of footing, wall and ledge elevations.
    - a. For CMU walls, coordinate with mason contractor to determine if low lift or high lift grouting will be used. Detail rebar and lap splices accordingly. Provide wall sections with all laps shown.
  - 4. Provide section views for various reinforcing conditions to completely detail project. Indicate required concrete cover. Duplicate all applicable sections from structural drawings and key into plans for each submittal. Failure to do so is cause for rejection of drawings.
    - a. Since installers typically only use rebar shop drawings during rebar installation, statements such as the following are unacceptable: "Placing drawings are merely

to supplement the project drawings, and contractor should use them in conjunction with them to make sure rebar installed is correct.”

- b. Engineer will provide electronic copies of applicable plans and details to assist the detailer to have complete and comprehensive shop drawings.
  - 5. All lap splices shall develop the full strength of the bar unless lesser laps are permitted by the drawings. Increase laps for epoxy-coated bars per ACI 318. Indicate laps on shop drawings.
  - 6. Where a column or pier is monolithic with a wall, run wall horizontal steel continuous through column or pier.
  - 7. Unless noted otherwise, provide dowels of same size and spacing as wall, beam or column to tie adjacent elements together.
  - 8. Provide all additional reinforcement as required at construction joints. Coordinate exact location with Contractor and show on shop drawings.
  - 9. Provide a schedule of shop drawing submittals for the Architect's information at least 30 days prior to the first shop drawing submittal. Shop drawings must be submitted in conformance with the agreed-upon submittal schedule.
  - 10. For simple projects with footings, basement, and/or foundation walls, shop drawings shall be complete on first submittal unless specifically agreed in writing by Engineer prior to submittal.
  - 11. Resubmittals of shop drawings: When a shop drawing is resubmitted with new or revised information, these items shall be "clouded". All redmarks from a previous submittal shall be incorporated.
  - 12. Reinforcing bars for which Shop Drawings have not been reviewed and approved shall not be fabricated.
  - 13. The omission from the Shop Drawings of any materials required by the Contract Documents shall not relieve Contractor of the responsibility of furnishing and installing such materials, even though the Shop Drawings may have been reviewed and approved.
- B. When it is necessary to relocate reinforcement to avoid conflicts with other reinforcement, conduits or imbedded items, submit the resulting arrangement of reinforcement to the A/E for acceptance.
  - C. When minimum concrete cover requirements cannot be maintained due to reinforcement size and geometry, notify the A/E prior to placing concrete.

#### **1.04 PRODUCT DELIVERY, HANDLING AND STORAGE**

- A. Store at site in racks to keep steel at least 6" above ground.
- B. Protect as required against excessive rusting or mechanical injury.
- C. Equipment for handling epoxy-coated bars shall have protected contact areas. Bundles of coated bars shall be lifted at multiple pick-up points to minimize bar-to-bar abrasion from sags in the bundles. Coated bars or bundles of coated bars shall not be dropped or dragged. Coated bars shall be stored on protective cribbing.

### **PART 2 - PRODUCTS**

#### **2.01 MATERIALS**

Metal reinforcement: Metal reinforcement shall conform to current standard specifications of ASTM.

- A. Reinforcing Bars: ASTM A615, deformed Grade 60 for billet steel bars for concrete reinforcement. All reinforcing steel required to be welded shall conform to ASTM A706.
- B. Epoxy-coated reinforcement, including dowels, top and bottom bars and stirrups, shall conform to ASTM A775. In addition, required coating thickness shall be 7 to 12 mils, with no single measurement less than 80% of the minimum, in conformance with AASHTO M284. Provide where specified on drawings and as specified below:
  - 1. Any horizontal flatwork including beams, joists and slabs subject to salt deterioration, including, but not limited to, slabs on grade, stoops, islands, curbs, exterior stairs and

ramps, etc. including welded wire mesh for supported construction. Welded wire mesh for slabs on grade need not be epoxy coated unless noted otherwise on the drawings.

- C. Epoxy patching or touchup material: conform to ASTM A775.
- D. Smooth dowel bars for expansion joints: conform to ASTM A306, Grade 36.
- E. Plastic Slip Dowel Sleeve: Where indicated, provide a plastic sleeve dowel cap (with reusable plastic base) to permit longitudinal movement of dowel within concrete section at construction and expansion joints.
  - 1. "Speed Dowel" or "Speed Load" with base, Greenstreak Group, Inc., St. Louis, MO.
  - 2. "Speed Dowels" with base, Dalco Industries, Inc.
  - 3. Approved equal.
- F. Provide bolsters, high chairs, support bars and stirrups as required to support specified reinforcing without excessive deflection in conformance with CRSI Standards, industry practice, or 4-0" on center, whichever is most restrictive. Provide stirrups in beams, etc. to support reinforcement where no other bars are specified. Use minimum #5 carrier bars where required. Accessories such as bolsters, spacers, ties and chairs shall be furnished to permit proper placing of steel. Except for footing applications, the use of bent reinforcing bar "standies" is not allowed. Conform to CRSI. Tie Wire: Minimum 16 gauge, annealed type. Provide plastic supports in corrosive environments or plastic-tipped for exposed-to-view concrete surfaces. Over waterproof membrane, use chairs with plastic plates to prevent penetration of the membrane.
  - 1. Where epoxy-coated bars are used, accessories shall be either epoxy-coated metallic, non-metallic, dielectric or other corrosion-resistant material. Tie Wire: Minimum 16 gauge, annealed type, nylon, epoxy or plastic coated.
  - 2. In corrosive or exterior construction, chairs, strongback bolsters, side form spacers, sand plate chairs shall be all plastic.
    - a. Aztec Plastic Products
    - b. Dayton Superior
    - c. Plasticon
    - d. Edgeworth
    - e. Approved equal
- G. Fabric shall be manufactured to meet ASTM A82, ASTM A185, and ASTM A884, where specified, 65 KSI yield strength. Fabric shall be manufactured of cold drawn wire of size specified on drawings and welded at intersections. Furnish flat sheets only. Unless noted otherwise provide:
  - 1. Slabs on Grade:
    - a. 6" x 6" (15 x 15 cm) - W1.4 x W1.4 WWF, for interior slabs 5" thick or less, unless noted otherwise.
    - b. 6" x 6" (15 x 15 cm) - W2.9 x W2.9 WWF, unless noted otherwise, for slabs greater than 5" thick, and for 5" thick slabs for exterior applications, in garages and parking structures.
  - 2. Topping: 6" x 6" (15 x 15 cm) - W1.4 x W1.4 WWF.
- H. Fiber Reinforcement in Concrete:
  - 1. General:
    - a. Fibers shall be used in accordance with ACI 360R, latest edition, "Guide to Design of Slabs-On Ground" for slab type 3.2.2.
      - 1) Synthetic fiber reinforcement, Section 11.2.
    - b. If Contractor or Owner has any concerns with the aesthetic appearance of fiber reinforced concrete, a mock up slab shall be constructed prior to placing the project.
  - 2. Macro-Synthetic Fibers (diameters equal or greater than 0.012 in. [0.30mm]; (blended fibers and combinations thereof):
    - a. Macro-Synthetic Fibers may be used as substitutes to WWF for temperature and shrinkage crack control (temperature reinforcement per ACI 360R, Section 3.2.2). Macro-synthetic fibers shall conform to ASTM C1116 and shall provide documented evidence of compliance with ICC-ES AC308.
    - b. May be used as a substitute for 6 x 6 W1.4, W2.1 and W2.9 WWF, in slabs on grade per Architect/ Engineering approval at manufacturer's recommended



dosage rate, but not less than ACI 360 minimums. Fiber manufacturer to provide in writing a recommended dosage for the intended use.

- 1) For 6" slabs or thicker in truck garages, provide 5 lbs. per cubic yard macro-synthetic fibers to replace wire mesh or rebar.
- c. May not be used as a substitute for any WWF in bonded concrete topping over precast.
- d. Macro-Synthetic fibers are required:
  - 1) For all metal pan stairs and landings, in addition to any WWF specified, at a dosage rate of 4 lbs./cu. yd.
- e. Approved Macro-Synthetic Fiber or Blended Products:
  - 1) FRC HPS-650 & FRC HPS-950 Blend, FRC Industries
  - 2) Forta Ferro, Forta Corp.
  - 3) Novomesh 950, Propex Concrete Systems
  - 4) Strux 90/40 or BT50, GCP Applied Technologies
  - 5) TUF-STRAND SF, Euclid Chemical
  - 6) "MasterFiber MAC or MAC Matrix" Series, BASF
  - 7) "Fibermesh 650", Propex Concrete Systems
  - 8) Approved equal
3. Fiber manufacturer or approved distributor shall provide the services of a qualified employee or engineer to Contractor for a pre-job meeting, initial job start-up and consultation.

## **2.02 FABRICATION**

- A. Fabricate concrete reinforcing in accordance with CRSI - Manual of Standard Practice, ACI SP-66 - ACI Detailing Manual, ACI 117, and ACI 318. All bars shall be shop fabricated and cut to required lengths.
- B. Bars with reduced cross-section, kinks, twists or bends other than shown by approved shop drawings shall not be used.
- C. All reinforcement shall be bent cold unless otherwise permitted by Structural Engineer.
- D. Welding of reinforcement is permitted only with the specific approval of Structural Engineer. Perform welding in accordance with AWS D1.4 using reinforcing conforming with ASTM A706.
- E. Fabricate and handle epoxy-coated reinforcing in accordance with ASTM D3963.
- F. Locate reinforcing splices not indicated on drawings at point of minimum stress.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Cleaning:
  1. All reinforcing shall be free from loose rust, scale, grease or other coating which might prevent proper bond.
  2. Provide means at site for cleaning before placement.
  3. Where there is delay in depositing concrete, reinforcement shall be re-inspected, and when necessary, cleaned and re-tied.
- B. Inspection: General Contractor and Inspection Service shall examine the formwork and other conditions under which concrete reinforcement is to be placed and notify Formwork Contractor of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected.

### **3.02 PLACING**

- A. Placing of reinforcing shall be in strict accordance with Concrete Reinforcing Steel Institute, Specifications for Placing of Reinforcements, within tolerances specified in ACI 117.

- B. All reinforcing shall be placed accurately and held in position to prevent its displacement during concrete operations by using annealed wire of not less than No. 16 gauge at intersections. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces. Reinforcing shall be supported by metal chairs or spacers. Bars shall be placed to the tolerance specified in ACI 318, Section 20.6 and ACI 117. Welding of crossing bars (tack welding) for assembly of reinforcement is prohibited.
- C. All placing and spacing of reinforcement shall be as shown on drawings. Place reinforcement to maintain specified concrete cover from finished surface.
- D. Footings, Wall, Beam, Girder and Slab Reinforcement:
  - 1. Unless otherwise shown, cover reinforcing with concrete as called for in ACI 318-14 Chapter 20.
  - 2. Support reinforcing at proper intervals and distances from forms by means of welded wire spacers or chairs.
  - 3. Separate multiple layers with approved spacers.
  - 4. Provide Class B laps, per ACI 318, where strip footings run into adjacent footings.
  - 5. Do not damage, penetrate or rupture membranes or vapor barrier/retarder.
- E. Repair of Epoxy Coating:
  - 1. Epoxy coating damage to reinforcing due to handling, shipment and placing need not be repaired in cases where the damaged area is 0.063 square inches or smaller (1/4" x 1/4"). Damaged areas larger than 0.063 square inches shall be repaired with patching/ touchup material in strict accordance with manufacturer's recommendations.
  - 2. The maximum amount of damage including repaired and unrepaired areas shall not exceed two percent (2%) of the surface area of each bar. Total damage in excess of the two percent (2%) limit is cause for rejection of the bar.
  - 3. Touch up all ends of cut reinforcing.
  - 4. Touch up damaged coating at bar bends.

### **3.03 SPLICES**

- A. Provide splices as shown on the drawings. Minimize the quantity of splices to the extent possible. Lap at splices shall be sufficient to transfer stress between bars by bond and shear. Furnish reinforcing bars in full lengths as indicated on the Contract Drawings and approved Shop Drawings.
- B. Do not splice bars unless indicated on the Contract Drawings or approved by the Engineer in writing. When authorized, make splices in accordance with ACI 318. Splices generally shall be avoided at points of maximum stress. Provide Class B lap for bars unless noted otherwise.
- C. Unless otherwise noted, welding of reinforcement to complete splices shall not be permitted.

### **3.04 EMBEDDED ITEMS**

- A. The Contractor shall provide for the installation of all items embedded in the concrete, such as coil rod inserts, anchor bolts, dowels, etc., as shown on the Contract Drawings or as provided for in other Divisions of these specifications. All dowel bars shall be tied securely in place before pouring concrete. Provide for clearances with appurtenant materials and devices.

### **3.05 CUTTING**

- A. Minimize field cutting of bar.
- B. Do not flame cut epoxy coated bar.
- C. When epoxy coated bar is cut in the field, coat the ends of the bars with epoxy coating. Apply epoxy coating in accordance with manufacturer requirements.

### **3.06 WELDED WIRE FABRIC (WWF)**

- A. Provide and install WWF in the longest practicable length.
- B. Provide supports as necessary to maintain reinforcing in a level, uniform orientation that is free of sags.
- C. Lap adjoining sheets one full mesh and tie. Extend WWF to within 2" of all edges of slabs or sections. Do not extend fabric across expansion joints.
- D. Do not make laps midway between supporting beams.
- E. Offset laps in adjacent sheets.

### **3.07 DRILLED AND GROUTED OR EPOXY DOWEL INSTALLATION**

- A. Existing concrete, which will be incorporated into new work and which requires integration with new concrete shall be doweled as indicated on the Contract Drawings in strict accordance with grout or epoxy manufacturer's instructions and as follows:
  - 1. Drill and prepare the hole in existing concrete per manufacturer's requirements. Incline the hole in the concrete such that the non-shrink grout or epoxy will be retained in the hole.
  - 2. Fill hole with non-shrink grout or epoxy.
  - 3. Immediately place dowel bar into hole.
  - 4. Allow grout or epoxy to take initial set before disturbing dowel bar.
  - 5. Reference Specification Section 05 05 19.

### **3.08 ALLOWANCE AND UNIT PRICES**

- A. Include in bid form as a separate line item, cost of furnishing, fabricating and installing 1000 lbs. of steel in addition to that indicated or specified to be used as directed by Architect or Structural Engineer. Contractor shall notify Architect and Engineer immediately when any amount of the allowance is used during the course of construction for Allowance Tracking. Any unused amount shall be credited to Owner at end of project.
- B. Contractor shall submit a unit price per ton for reinforcing steel in place. This unit cost will be used to determine adjustments to the reinforcement steel allowance.
- C. Where reinforcing is not indicated or defined, include for bid purposes:
  - 1. Walls: #5 each way each face. Spacing in inches =  $140/(\text{wall thickness in inches})$  but not over 18" o.c.
  - 2. Columns/Piers: 1-#9 vert. per 50 square inches of cross sectional area (4 bars minimum) and #3 sets of ties at 9", conforming to ACI 318.
  - 3. Notify Structural Engineer for additional information and clarification prior to shop drawings.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

## SECTION 03 30 00

### CAST-IN-PLACE CONCRETE

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

- A. Work Included: Cast-in-place concrete required for this Work is indicated on the drawings and includes, but is not necessarily limited to:
  - 1. Footings and foundations
  - 2. Formed concrete, toppings
  - 3. Slabs on grade
  - 4. Sidewalks and porches
  - 5. Exterior flatwork
  - 6. Footings for sign and exterior lighting
  - 7. Concrete curbs, equipment pads and other miscellaneous
  - 8. All other concrete work indicated on drawings
- B. Provide all work, materials, labor, equipment and supervision necessary.
- C. Related Work Specified Elsewhere:
  - 1. Earthwork - Section 31 00 00
  - 2. Concrete Formwork - Section 03 10 00
  - 3. Concrete Reinforcement - Section 03 20 00
  - 4. Concrete Hardener/Sealer - Section 03 35 00
  - 5. Polished Concrete Finishing – Section 03 35 10
  - 6. Post-Installed Anchors - Section 05 05 19
  - 7. Structural Steel - Section 05 10 00

##### **1.02 QUALITY ASSURANCE**

- A. All work shall be in accordance with applicable manufacturer's and supplier's printed instructions.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment. Manufacturer shall be certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Qualifications of Workers:
  - 1. Provide at least one person who will be present at all times during execution of this portion of the work who is thoroughly trained and experienced in placing the types of concrete specified and who will direct all work performed under this Section.
  - 2. For finishing of exposed surfaces of concrete, use only thoroughly trained and experienced concrete finishers.
  - 3. The qualified installer shall employ on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- D. Correction of Defective Work: All concrete work which does not conform to the requirements of the Contract Documents and ACI 301, including function, durability, appearance, strength, cracking, tolerances and finishing, shall be corrected as directed by Architect at Contractor's expense. Additional testing, engineering, reinforcement and removal and replacement of defective concrete shall be paid for by Concrete Contractor. Contractor shall also be responsible for the cost of corrections to any other work affected by or resulting from corrections to the concrete work.
  - 1. Concrete repairs including, but not limited to, patching, epoxy injection, routing and sealing, shall be performed by a specialty repair/restoration contractor, certified by the material supplier.
    - a. Provide qualifications to Architect and Structural Engineer for review and approval.

- b. Restoration contractor shall provide material lists, and describe means and methods to Architect and Structural Engineer for review, prior to commencement of work.
  - c. Acceptance of units, repaired pursuant to written approval, is contingent upon repairs being skillfully done so as to be sound, permanent, flush with adjacent surfaces and, when exposed, of color and texture matching similar adjoining surfaces and showing no apparent line of demarcation between original and repaired work.
- E. All preparing of concrete specimens and testing shall be performed by an independent testing laboratory hired by the Contractor, qualified according to ASTM C1077 and ASTM E329 for testing indicated. Test reports shall be sent to Architect with copies to Contractor and ready mixed concrete producer.
  - 1. The individuals who sample and test concrete to determine if the concrete is being produced in accordance with this specification, and that slump, air content, temperature and cylinder tests are in conformance with this Specification shall have demonstrated a knowledge and ability to perform the necessary test procedures equivalent to the ACI Minimum Guidelines for Certification of Concrete Field Testing Technicians, Grade 1. A current certificate shall be presented upon request by Architect. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
  - 2. Technician shall have full knowledge of required specifications prior to performance of field tests. Any non-conformance to specification shall be reported by email or fax immediately to Structural Engineer prior to field placement of concrete.
  - 3. This Contractor shall cooperate in taking of test samples and shall make adjustments in mix based on results of tests as directed by Architect.
- F. Under-Slab Vapor Barrier/Retarder Inspection and Report: Material Testing Agency hired by the Contractor shall review and approve installation prior to concrete placement. Contractor shall make necessary corrections. Provide written report to Architect and Structural Engineer.
- G. Polished Concrete Pre-Installation Conference and Mockup: See Section 03 35 10.

### 1.03 SUBMITTALS

- A. Materials List: Within 30 days after award of Contract, and before any concrete is delivered to the job site, submit to Architect, in accordance with General Conditions, a complete list of all materials proposed to be furnished and installed under this portion of the Work, showing manufacturer's name and catalog number of all items such as admixture and membrane, and the name and address of transit-mix concrete supplier. Prior to starting construction, General Contractor shall also furnish a statement to Architect giving source, sieve analysis and specific gravity of both fine and coarse aggregate, proportions by weight (dry) of cement, fine and coarse aggregates, admixtures, and water that will be used in the manufacture of each class of concrete specified. No change in source of materials shall be made without prior notification to Architect.
- B. Concrete Mix Design: Submit Concrete Mix Designs including masonry grout to Architect for review. This submittal shall include the following:
  - 1. Required cylindrical compression strength for  $f'_c$  (28 day).
  - 2. Structural element (footings, walls, beams, etc.) in which each class (strength of concrete) will be used.
  - 3. Cylinder compressive strength test results or complete standard deviation analysis in accordance with ACI 318.
  - 4. Proportions of Materials.
  - 5. Source of materials - Cement (type and brand), gravel pit.
  - 6. Aggregate size and certification from an independent testing lab that gradation, specific gravity, soundness, absorption, and impurities meet ASTM requirements.
  - 7. Admixture brand, dosage, literature.
  - 8. Air content.
  - 9. Water content and target slump.
  - 10. Indicate amounts of mixing water to be withheld for later addition at Project site.
  - 11. Unit weight per cubic yard. For lightweight concrete, provide correlation between fresh density and equilibrium density for the mix per ACI 301.

12. Range of ambient temperature and humidity for which design is valid.
  13. Special characteristics of mix which require precautions in mixing, placing, or finishing techniques to achieve finished product specified.
  14. Coordination with Concrete Surface Treatment suppliers and Polished Concrete Installer.
- C. Product Data: Submit manufacturer's product data for review with application and installation instructions for proprietary materials and items including: vapor barrier/retarders, patching compounds, epoxies, grouts, waterstops, joint systems, curing compounds, hardeners, sealers, etc. for all items specified in materials list and used for this project.
- D. Substitutes to Specified Items:
1. Provide all product literature for substitutes to Architect for review.
  2. Manufacturer's Representative shall certify in writing that the proposed substitute product meets or exceeds all requirements, test results, etc. in the Specification and the specified product's literature. Provide test results performed by an independent testing agency using the same test methods.
  3. Specify amount of credit to owner if substitute is approved.
  4. Contractor shall incorporate into schedule 10 working days for Architect/Engineer review of substitutes and alternates.
- E. Construction Joints: Submit drawing of proposed construction joints for review for slabs on grade, structural floors, roofs and walls, if different from those shown on drawings or if none shown on drawings.
1. Length to width ratio for slabs on grade shall not exceed 1.5 to 1.
  2. Length to width ratio of a concrete floor pour shall not exceed 2.5 to 1, including slabs on metal deck.
  3. Concrete on metal deck: 10,000 SF with maximum dimension of 100 ft.
  4. Do not provide control joints in floor slabs supported by metal deck, or precast composite toppings, unless noted otherwise.
- F. Transit-mix delivery slips: With each load of concrete delivered to job, delivery tickets shall be furnished by ready-mixed concrete producer to the Contractor. Contractor shall retain the delivery tickets and make the record available to Architect for inspection upon request. Delivery tickets shall provide following information:
1. Date
  2. Name of ready-mixed concrete plant
  3. Job location
  4. Contractor
  5. Type (Standard, A.E. or H.E.S.) and brand name of cement
  6. Class and specified cement content in pounds per cubic yard (.76 m3) of concrete
  7. Truck number
  8. Time dispatched
  9. Amount of concrete in load in cubic yards (.76 m3)
  10. Admixtures in concrete
  11. Maximum size of aggregate
  12. Water added at job, if any.
- G. Provide copies of all quality assurance testing reports.

#### **1.04 PRODUCT HANDLING**

- A. Protection: Use all means necessary to protect cast-in-place concrete materials before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of Architect at no additional cost to Owner.
- C. Do not use aluminum pipe if concrete is to be transported by means of pumping. Aluminum will not be allowed in concrete.

## 1.05 REFERENCE SPECIFICATIONS

- A. The following latest edition reference specifications, guides and standards shall become part of this specification as if herein written. If provisions conflict, the more stringent provisions shall apply.

ACI 117 - Specifications for Tolerances for Concrete Construction and Materials and Commentary

ACI 211.1 - Recommended Practice for Selecting Proportions for Normal Mass and Heavyweight Concrete

ACI 211.2 - Recommended Practice for Selecting Proportions for Lightweight Concrete

ACI 212 - Chemical Admixtures for Concrete

ACI 214 - Recommended Practice for Evaluation of Results of Tests used to Determine the Strength of Concrete

ACI 301 - Specifications for Structural Concrete for Buildings

ACI 302.1 - Guide for Concrete Floor and Slab Construction

ACI 302.2 - Guide for Concrete Slabs that Receive Moisture - Sensitive Flooring Materials

ACI 303.1 - Standard Specification for Cast-In-Place Architectural Concrete

ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete

ACI 304.2R - Placing Concrete by Pumping Method

ACI 305.1 - Specification for Hot Weather Concreting

ACI 306 - Cold Weather Concreting

ACI 306.1 - Standard Specification for Cold Weather Concreting

ACI 308.1 - Standard Specification for Curing Concrete

ACI 309 - Recommended Practice for Consolidation of Concrete

ACI 318 - Building Code Requirements for Reinforced Concrete

ACI 330.1 - Specification for Unreinforced Concrete Parking Lots

ASTM C31 - Method of Making and Curing Concrete Specimens in the Field

ASTM C33 - Standard Specification for Concrete Aggregate

ASTM C39 - Test Method for Compressive Strength of Cylindrical Concrete Specimens

ASTM C94 - Standard Specification for Ready-Mixed Concrete

ASTM C138 - Standard Method of Test for Weight per Cubic Foot, Yield, and Air Content (Gravimetric) of Concrete

ASTM C143 - Standard Method of Test for Slump of Portland Cement Concrete

ASTM C150 - Specification for Portland Cement

ASTM C171 - Sheet Materials for Curing Compound

ASTM C172 - Method of Sampling Fresh Concrete



ASTM C173 - Standard Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method

ASTM C192 - Standard Method of Making and Curing Concrete Test Specimens in the Laboratory

ASTM C231 - Standard Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method

ASTM C260 - Specification for Air-Entraining Admixtures for Concrete

ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

ASTM C404 - Standard Specification for Aggregates for Masonry Grout

ASTM C476 - Standard Specification for Grout for Masonry

ASTM C494 - Specification for Chemical Admixtures for Concrete

ASTM C595 - Specification for Blended Hydraulic Cements

ASTM C618 - Specification for Fly Ash and Raw or Calcinated Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete

ASTM C989 - Standard Specification For Slag Cement For Use in Concrete and Mortars

ASTM C1017 - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete

ASTM C1611 - Standard Test Method for Slump Flow for Self-Consolidating Concrete

ASTM D1751 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)

ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting

ASTM E1155 - Standard Test Method for Determining  $F_F$  Floor Flatness and  $F_L$  Floor Levelness Numbers

ASTM E1643 - Standard Practice Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs

ASTM E1745 - Standard Specification for Water Vapor Retarders used in contact with Soils or Granular Fill under Concrete Slabs

OSHA Standard "Safety and Health Regulations for Construction", Part 1926 Subpart Q: "Concrete and Masonry Construction"

ANSI A10.9 "Safety Requirements for Concrete Construction and Masonry Work"

#### **1.06 GENERAL NOTES**

- A. Reinforcing steel will be furnished and placed under Section 03 20 00, but this Contractor shall cooperate fully.
- B. Foundations are designed for soil pressure indicated. If bearing capacity of soil varies, foundations may be redesigned after excavation has been made.
- C. General excavation will be done under Section 31 00 00, but this Contractor shall trim and square all column and wall footings, steps and pits.

- D. Backfill against inside of exterior walls, against pit walls and all footings to underside of floor slabs with compacted engineered structural fill. Refer to Specification 31 00 00.
- E. Level off and tamp earth at proper grade over all areas where concrete floor slabs will be placed on gravel or sand fill.
- F. Cooperate with other trades regarding installation of embedded items. Templates and instructions will be provided for items not set in forms.

## **PART 2 - PRODUCTS**

### **2.01 CONCRETE MATERIALS**

- A. General: All concrete, unless otherwise specifically permitted by Architect, shall be transit-mixed in accordance with ASTM C94.
  - 1. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.
- B. Portland Cement:
  - 1. Standard Portland Cement: ASTM C150, Type 1.
  - 2. High Early Strength Portland Cement: ASTM C150, Type 3.
- C. Aggregates:
  - 1. In general, comply with ASTM C33.
  - 2. Fine natural sand, clean, hard, strong, durable, uncoated grains, free from all injurious, deleterious substances passing No. 4 sieve.
  - 3. Coarse gravel or crushed stone, clean, hard, strong, durable, uncoated pieces free from deleterious substances.
    - a. 1-1/2" (3.8 cm) maximum size aggregate shall conform to gradation for size No. 4 and 3/4" (1.9 cm) aggregate to size No. 67 in Table II of ASTM C33.
    - b. When 1-1/2" (3.8 cm) size is used, it shall be proportioned with 3/4" (1.9 cm) aggregate so as to produce gradation conforming to size No. 467 in Table II of ASTM C33.
    - c. For slabs-on-grade, provide a low curl mix with well graded aggregates without gaps, with combined aggregate gradation 8%-18% for large top size aggregates (1-1/2 in.) or 8%-22% for smaller top size aggregates (1 in. or 3/4 in.) retained on each sieve below the top size and above the No. 100. Aggregates shall be graded to try to achieve a coarseness factor close to 70, workability factors of 35, and mortar factors less than 54.
      - 1) Use the largest size of specified and properly graded aggregate available, e.g. aggregate up to 1/3 the slab thickness, 2" maximum, or #2 stone.
      - 2) Coarse aggregate should comprise approximately 60% of the total aggregate in the mix.
      - 3) Crushed limestone is preferable to natural stone.
      - 4) A natural sand with a fineness modulus of 2.70 to 2.90 is preferable.
      - 5) For polished concrete use natural stone, not crushed limestone, with good size variation. Refer to Specification 03 35 10.
  - 4. Where concrete is exposed to view, aggregate shall not contain iron or other staining elements.
  - 5. For exterior exposed surfaces, sidewalks, drives, etc. and parking structures, do not use fine or coarse aggregates containing spalling-causing substances. The amount of chert with a specific gravity less than 2.40 shall be limited to 1.0% of the weight of the coarse aggregate.
- D. Fly Ash: ASTM C618 Class "C", the product of only one manufacturer using one source of coal. Maximum loss on ignition shall not exceed three percent (3%).

- E. Slag Cement: ASTM C989, Grade 100 or Grade 120 ground granulated blast-furnace slag.
- F. Chemical Admixtures:
1. Admixtures shall not contain intentionally-added chlorides. The addition of calcium chloride to the concrete mix is prohibited.
  2. Water Reducing Admixtures - conform to ASTM C494, Type A
    - a. Axim
    - b. BASF
    - c. Euclid Chemical Co.
    - d. Sika Corp.
    - e. GCP Applied Technologies
    - f. Approved equal
  3. Water Reducing, Retarding Admixture - conform to ASTM C494, Type D
    - a. Axim
    - b. BASF
    - c. Euclid Chemical Co.
    - d. Sika Corp.
    - e. GCP Applied Technologies
    - f. Approved equal
  4. High Range Water Reducing Admixture (Superplasticizer) - conform to ASTM C494, Type F or G (retarding), site applied only.
    - a. Axim
    - b. BASF
    - c. Euclid Chemical Co.
    - d. Sika Corp.
    - e. GCP Applied Technologies
    - f. Approved equal
  5. Mid-Range Water Reducing Admixture (MRWR) - conform to ASTM C494, Type A.
    - a. Axim
    - b. BASF
    - c. Euclid Chemical Co.
    - d. Sika Corp.
    - e. GCP Applied Technologies
    - f. Approved equal
  6. Non-Corrosive, Non-Chloride Accelerator - conform to ASTM C494, Type C or E. Maximum dosage of 0.2% sodium thiocyanate per mass of cement.
    - a. Axim
    - b. BASF
    - c. Euclid Chemical Co.
    - d. Sika Corp.
    - e. GCP Applied Technologies
    - f. Approved equal
  7. Air Entraining Admixture - conform to ASTM C260
    - a. Axim
    - b. BASF
    - c. Euclid Chemical Co.
    - d. Sika Corp.
    - e. GCP Applied Technologies
    - f. Approved equal
  8. Certification: Written conformance to the above mentioned requirements and the chloride ion content of the admixture is required from the admixture manufacturer.
- G. Evaporation Retardant:
1. "Confilm", BASF
  2. "Eucobar", Euclid Chemical Co.
  3. "Sealtight Evapre", W.R. Meadows, Inc.
  4. Approval equal
- H. Water: ASTM C1602, potable

- I. Curing Compound:
  1. Curing compounds shall be used for interior applications which require dissipating materials that are compatible with and allow proper installation of paint, resilient tile, flooring, hardeners, or other finish surfaces.
  2. Liquid type, membrane forming curing compound complying with ASTM C309, Type 1, Class A & B with 25% solids, VOC compliant.
    - a. Provide test data from an independent testing laboratory indicating a maximum moisture loss of 0.55 grams per sq. cm. when applied at a coverage rate of 200 sq. ft. per gallon.
    - b. Colorless, clear or with fugitive dye or pigment, non-yellowing, U.V. resistant, strippable, self-dissipating, non-penetrating, resin-based, not wax-based or chlorinated rubber.
      - 1) "Sealtight 1100 Series, Resin and Water-based", W.R. Meadows, Inc.
      - 2) "Kurez DR VOX", "Kurez RC" or "Kurez RC Off", Euclid Chemical
      - 3) Approved equal
    - c. Contractor shall verify compatibility of any curing compound with floor covering supplier.
- J. Curing and Sealing Compound:
  1. Curing and sealing compounds shall be used for interior or exterior applications where concrete is left exposed with no other finish coating or hardener. Compound shall be compatible with paint or striping applications.
  2. Liquid type, membrane forming curing and sealing compound complying with ASTM 1315 Type 1, Class A with 25% solids, VOC compliant.
    - a. Provide test data from an independent testing laboratory indicating a maximum moisture loss of 0.04 grams per sq. cm. when applied at a coverage rate of 300 sq. ft. per gallon.
    - b. Colorless, clear or with fugitive dye or pigment, non-yellowing, U.V. resistant, resin based, not wax based.
      - 1) "Sealtight Vocomp-25", W.R. Meadows, Inc. (Interior or exterior use - water base)
      - 2) "Super Aqua Cure VOX", Euclid Chemical
      - 3) "Super Diamond Clear VOX", Euclid Chemical
      - 4) "Kure-N-Seal 25LV", Sonneborn, Div. of BASF
      - 5) Approved equal
  3. Refer to the Room Finish Schedule and Section 03 35 00 for liquid hardeners/sealers to be used.
- K. Penetrating Colloidal Concrete Treatment
  1. May be used as a Contractor option as a substitute for specified curing compounds and curing and sealing compounds for concrete flatwork.
  2. Products:
    - a. "SCP 327", Spray-Lock Concrete Protection, for 4500 psi concrete or less.
    - b. "SCP 327LP", Spray-Lock Concrete Protection, for concrete greater than 4500 psi.
  3. Conditions
    - a. Apply per manufacturer's Guide Specifications
    - b. Manufacturer's Representative shall be available for consultation during construction.
    - c. Apply within manufacturer's recommended temperature limit.
    - d. Prepare substrates as required.
  4. Warranty: Manufacturer shall provide 15 year limited warranty against material defects and will warrant covering against separating from the concrete substrate due to water migration through the concrete.
- L. For stairs, landings, platforms and where otherwise indicated in Room Finish Schedule as "non-skid" or "non-slip", provide non-slip, abrasive aggregate to be 100 percent aluminum oxides (A1203) applied at manufacturer's recommended application rates. Use material that is factory-graded, packaged, rust-proof, and non-glazing, and is unaffected by freezing, moisture, and cleaning materials. Submit samples for Architect's approval.
  1. "Alundum", Norton Co.

2. "Mastertop 120SR", BASF
  3. Approved equal
- M. Anchorage Items: Slots and inserts for anchoring masonry, tile and mechanical equipment to concrete of standard manufacture.

## 2.02 MISCELLANEOUS MATERIALS

- A. Expansion/Isolation Joints:
1. Pre-molded expansion joint strips for concrete slab-on-grade construction (also referred to as expansion felt or joint filler), 3/8" thick minimum or as specified on drawings, pre-molded resilient, compressible, re-expanding, non-extruding, bituminous asphalt or fiber materials, conforming to ASTM D994 or ASTM D1751. Flexible foam expansion joints may be used, conforming to ASTM D5249, Type 2. May be used for cold or hot-applied joint sealing compounds.
    - a. "Sealtight" Asphalt or fiber expansion joints, W.R. Meadows
    - b. "Sealtight Ceramar", W.R. Meadows
    - c. Masco
    - d. Approved equal
  2. When the tops of joints are specified to be filled with sealant, expansion joint filler strips shall be flexible closed-cell polyethylene, thickness and width as required, conforming to ASTM D4819, Type 2. Use for cold-applied joint sealing compounds.
    - a. "Expansion Joint Filler", Sonneborn (BASF)
    - b. "Sealtight Deck-o-foam", W.R. Meadows
    - c. "X-Tech", C2 Products, Inc.
    - d. "Harris Polyethylene Joint Filler", A.H. Harris & Son, Inc.
    - e. Expanda fill, Corden Manufacturing
    - f. Approved equal
  3. Joint Sealants: Polyurethane joint sealant for slab-on-grade control and construction joints required for all exposed concrete including interior vehicle parking and maintenance areas, exterior construction, at exterior intersections with walls piers and other vertical surfaces, and parking structures, except industrial floors where epoxy joint filler is required. Provide backer rod when shown on plans or as required by Manufacturer.
    - a. "Sikaflex 2CSL", Sika
    - b. "THC-900", Tremco, level surfaces
    - c. "Vulkem 245SL", Tremco
    - d. "THC-901", Tremco, sloped surfaces
    - e. "Eucolastic II", Euclid Chemical
    - f. "Sonolastic SL2", BASF
    - g. Approved equal
  4. Sealant for Freezer/Cooler slab-on-grade:
    - a. "Sikaflex 2CNS", Sika
    - b. "Spectrum 800/900SL", Tremco
- B. Waterstops: Provide waterstops at construction joints and other joints as shown.
1. Virgin Polyvinyl Chloride (PVC) Waterstops conforming to Corp. of Engineers CRD-C572.
    - a. Center bulb type, 6" minimum width, 3/8" minimum thickness, non-tapered and able to accommodate movement of up to 5/16 inch.
    - b. Provide factory installed punched holes or grommets, or field installed hog rings spaced at 12 inches on center along length and in the outermost rib of the waterstop.
    - c. Provide factory made waterstop fabrications for all changes of direction, corners, intersections, and transitions leaving only straight butt joint splices for the field.
    - d. Provide Teflon coated, thermostatically-controlled waterstop splicing irons for field butt splices.
    - e. Products:
      - 1) Meadows "Sealtight" #6380
      - 2) Vinylex #RB638H
      - 3) Sika Greenstreak #732
      - 4) Durajoint Type 9
      - 5) Approved equal

2. Bentonite Waterstops: Use where shown on plans. May not be used as a substitute for PVC waterstops or at moving joints.
    - a. "Superstop" and "Parastop II", Paramount, Division of Tremco, Cleveland, OH.
    - b. "Waterstop-RX", CETCO
    - c. "Swellstop", Sika Greenstreak, St. Louis, MO.
    - d. Approval equal
  3. Hydrophilic, "rubber" type Waterstops":
    - a. Hydrophilic waterstops shall be used in non-moving joints where new concrete is poured against existing concrete, and around conduits or piping. Select the waterstop profile based upon the manufacturer's recommendations for the concrete thickness. Maintain minimum of 3" concrete cover or as required by manufacturer.
    - b. May be used as an option/alternate to bentonite waterstops.
    - c. Products:
      - 1) "Adeka Ultra-seal", OCM, Inc., Vernon Hills, IL
      - 2) "Adcor ES," GCP Applied Technologies, Cambridge, MA
      - 3) "Hydrotite", Sika Greenstreak, St. Louis, MO
      - 4) "SikaSwell A", Sika Greenstreak, St. Louis, MO
      - 5) Approved equal
  4. Bentonite and Hydrophilic Waterstop Accessories: As required and approved by Manufacturer.
    - a. Epoxy gel (e.g. Greenstreak 7300) for attachment to rough, wet or dry concrete.
    - b. Hydrophilic sealant (e.g. Leakmaster by Greenstreak) to secure to rough, dry concrete.
    - c. Super glue at all splices.
- C. Under-Slab Vapor Barrier:
1. Meet or exceed the requirements of ASTM E1745 Class "A", ASTM E154, ASTM E96, or ASTM F1249 with water vapor permeance of 0.02 perms or less after mandatory conditioning tests per ASTM E1745.
  2. Provide manufacturer product literature and samples to engineer for review.
  3. Material: Minimum 15 mil polyolefin non-reinforced film with virgin resins and no recycled materials. Single ply polyethylene is prohibited.
    - a. "Stego Wrap (15 mil), Stego Industries, CA
    - b. "Vapor Block 15 (15 mil), Raven Industries, South Dakota
    - c. "Perminator (15 mil), W.R. Meadows, IL
    - d. "Viper VaporCheck II (15 mil), Insulation Solutions, EastPeoria, IL
    - e. "Moistop Ultra 15" (15 mil), Fortifiber
    - f. "Griffolyn 15 Mil" Reef Industries
    - g. Eco-shield E15" (15 mil), Epro Waterproofing Systems
    - h. Approved equal
  4. Accessories: Seam tape, repair tape, mastic, detail strips and pipe boots supplied by manufacturer.
- D. Insulation:
1. Insulation Against Walls: Extruded polystyrene (XPS) insulation board. ASTM C578, Type IV, 25 psi minimum compressive strength, 2" thick, R=10.
    - a. "Styrofoam SM", Dow Chemical Company
    - b. "Foamular 250", Owens Corning
    - c. "Certifoam 25", DiversiFoam Products
    - d. "GreenGuard", Kingspan Insulation LLC
    - e. Approved equal
  2. Insulation Below Concrete Slabs:
    - a. Below slabs on grade, exterior plazas, or above structural slabs, where insulation is 9" thick or less, provide extruded polystyrene insulation, 60 psi minimum compressive strength, exceed ASTM C578 Type VII.
      - 1) "Styrofoam Highload 60", Dow Chemical Company
      - 2) "Foamular 600", Owens Corning
      - 3) "GreenGuard Type VII 60 psi XPS Insulation Board", Kingspan Insulation LLC
      - 4) Approved equal

- b. Below slabs on grade, pavements, exterior plazas, or above structural slabs, where insulation is over 9" thick, provide expanded (EPS) or extruded (XPS) polystyrene insulation, 25 psi minimum compressive resistance at 10% Strain Deformation per ASTM D1621 or D6817, exceed ASTM C578 Type IX or Type IV. Installation per manufacturer's recommendation.
      - 1) "Durafill Geofoam EPS29", Plymouth Foam, Plymouth, WI
      - 2) "Foamular 250", Owens Corning
      - 3) "InsulFoam GF EPS29", InsulFoam LLC
      - 4) "Duraspec F250", Plymouth Foam
      - 5) Approved equal
    - c. Below stair risers and stadium seating, provide expanded (EPS) or extruded (XPS) polystyrene insulation, 15 psi minimum compressive resistance at 10% Strain Deformation, exceed ASTM C578 Type II. Installation per manufacturer's recommendation.
      - 1) "Durafill Geofoam EPS22", Plymouth Foam, Plymouth, WI
      - 2) "Foamular 150", Owens Corning
      - 3) "InsulFoam GF EPS22", InsulFoam LLC
      - 4) "Duraspec F150 HD", Plymouth Foam
      - 5) Approved equal
- E. Grout: Use for base plates, setting plates, dowels and other locations noted on Drawings in accordance with manufacturer's requirements. Do not use as masonry grout.
  1. Dry pack to plastic state, ready-to-use, non-shrink, non-metallic grouting material requiring only mixing with water at job site. Conform to ASTM C827, C1090 and C1107 with minimum and maximum height change of 0% and 4% respectively.
    - a. "Set Grout", BASF
    - b. "Five-Star Grout", U.S. Grout Company
    - c. "Euco-NS", Euclid Chemical
    - d. "Sikagrout 212", Sika Chemical Co.
    - e. "CG-86", W.R. Meadows Sealtight
    - f. Approved equal
  2. High Flow Grout: Where high fluidity and/or increase placing time is required use high flow grout. The factory pre-mixed, non-shrink grout shall conform to ASTM C827, C1090 and C1107 with minimum and maximum height change of 0% and 4% respectively.
    - a. "Euco Hi-Flow Grout", Euclid Chemical Co.
    - b. "Masterflow 928", BASF
    - c. "Duragrout", L&M Construction Chemicals
    - d. "Five-Star Grout", U.S. Grout Company
    - e. "Sikagrout 328", Sika Chemical Co.
    - f. "CG-86", W.R. Meadows Sealtight
    - g. Approved equal
- F. Sleeves, Anchors, Inserts and Pipe Openings:
  1. Except as otherwise shown or specified, provide and install all sleeves, anchors, inserts, wood block, grounds, bolts, nuts, washers and ties of every description to be cast into concrete and permit passage of other work through concrete. Install dovetail slot anchors in all concrete walls where masonry walls abut.
  2. Set anchor bolts and all miscellaneous items according to template and setting diagrams furnished by other trades and Contractors for casting into concrete to accommodate their work.
  3. Provide additional reinforcement for the concrete as directed due to the size of the unit being cast in the concrete.
  4. Inserts for hangers for piping, mechanical fixtures, etc. will be furnished by mechanical trades. Install as directed.
  5. Conduits, pipes and sleeves of any material not harmful to concrete and within limitations of this paragraph and structural drawings may be embedded in concrete walls, subject to the review and approval of Engineer. Conduits, pipes, sleeves, etc. placed within concrete columns, footings, slabs, and precast toppings are not allowed. Location of the reinforcing steel shall have priority over the location of all conduit, pipes or sleeves. In case of conflicts between the reinforcing and conduit, pipes or sleeves, this Contractor shall notify Architect immediately. If Contractor fails to request interpretation, all required changes

shall be made without additional cost to Owner.

- G. Edge Forms and Screeds: Proper wood or metal screeds, accurately leveled and securely fastened, shall be provided to bring the floor and other slabs to the required elevation for the concrete strike-off operation.
- H. Moisture Absorptive Cover for Moist Curing: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
  - 1. Alternatively, use moisture retaining cover.
- I. Moisture Retaining Cover:
  - 1. 7-Day Moisture-Retaining Concrete Wet Curing Blanket - ASTM C171: A single-use naturally colored, non-staining natural cellulose fabric with a non-perforated reflective (white) polyethylene coating containing stabilizers to resist degradation from ultraviolet light. Fabric shall exhibit low permeability and high moisture retention.
    - a. UltraCure NCF by Sika Greenstreak, St. Louis, MO.
    - b. Approved equal
- J. Bonding Compound: Polyvinyl acetate or acrylic base, re-wettable type, for cosmetic nonstructural repairs.
  - 1. "Tammsweld" or "Dural Prep AC", Euclid Chemical
  - 2. "Weldcrete", Larsen Co.
  - 3. "Thorobond", BASF
  - 4. Approved equal
- K. Epoxy Products: Two component material suitable for use on dry or damp surface, complying with ASTM C881, for use in all structural concrete repairs.
  - 1. Products for Crack Repair:
    - a. "Eucopoxy Injection Resin", "Dural Fast Set Gel and LV" or "Dural 50", Euclid
    - b. "Concresive Standard LVI", BASF
    - c. "Sikadur 35 Hi Mod LV", Sika Chemical Company
    - d. Approved equal
  - 2. Products for Epoxy Mortar Patches, Interior use:
    - a. "Concresive LPL Liquid", BASF
    - b. "Euco Epoxy #452" or "Duralcrete System", Euclid
    - c. "Sikadur 21 Lo Mod LV", Sika Chemical Company
    - d. "Sikadur 23 Lo Mod Gel", (overhead, vertical)
    - e. Approved equal
  - 3. Products for Epoxying Bolts or Reinforcing Steel into Concrete: See Specification 05 05 19.
- L. Polymer Modified Mortars with Corrosion Inhibitor, Exterior for corrosive environments including parking structures and pools:
  - 1. "Thin Top Supreme, Concrete Top Supreme" horizontal repairs, Euclid Chemical
  - 2. "Verticoat/Verticoat Supreme" or "Eucocrete", vertical repairs, Euclid Chemical
  - 3. "Sikatop 122 Plus"; horizontal repairs, Sika Chemical Company
  - 4. "Sikatop 123 Plus"; vertical repairs, Sika Chemical Company
  - 5. "SD2 Repair Mortar", horizontal repairs, BASF
  - 6. "HB2 Repair Mortar", vertical/overhead repairs, BASF
  - 7. Approved equal
- M. Polymer Modified Mortars for interior or exterior concrete surface repairs including spalls and patches in non-corrosive environments:
  - 1. "Sika Repair 222 with Sikalatex R"; horizontal repairs Sika Chemical Corp.
  - 2. "Sika Repair 223 with Sikalatex R"; vertical repairs, Sika Chemical Corp.
  - 3. "Euco Verticoat Supreme" or "Speed Crete Red Line", Euclid Chemical
  - 4. "Euco Thin Top Supreme" or "Tammspatch II", Euclid Chemical
  - 5. "Emaco R310 CI", horizontal repairs, BASF
  - 6. "Gel Patch", vertical/overhead repairs, BASF
  - 7. Approved equal



- N. Self-Leveling Mortars for Slab Fill Repair Products, Interior use, Structural Wear Surface:
1. "Flo-top" or "Super Flo-top", Euclid Chemical
  2. "Sikatop 111", Sika Chemical Co.
  3. "Mastertop Topping 112", BASF
  4. Approved equal
- O. Self-leveling Mortars for Slab Fill, Exterior use with corrosion inhibitors:
1. "Sikatop 111 Plus", Sika Chemical Co.
  2. "Duraltop Flowable Mortar", Euclid Chemical
  3. "Emaco R310 CI", BASF
  4. Approved equal
- P. Reglets: Where resilient or elastomeric sheet flashing or bituminous membranes are terminated in reglets, provide reglets of not less than 26 gage galvanized sheet steel. Fill reglet or cover face opening to prevent intrusion of concrete or debris.

## 2.03 MIXES AND DELIVERY

- A. Concrete Mix:
1. Ready-mixed concrete shall be subject to the following:
    - a. Concrete must meet all requirements of the ASTM C94, ACI 211, ACI 318-14 Chapter 19 and Section 26.4, and those herein specified for materials, proportioning, mixing and other details of manufacturer, quality and deliver, whichever is more restrictive or costly.
    - b. Submit suitable evidence as to experience, equipment and capacity of plant to Architect for approval.
- B. Mix Proportioning: Furnish ready-mixed concrete in accordance with the following:

Type of Construction	Min. Comp. Strength at 28 day (U.N.O.) PSI	Max. Slump In.	Max. Agg. In.	Min. Cement Lbs/C.Y.	Air En-trained	Footnotes
All Footings	3000	2-4	1.5	470	No	
Interior Walls, Stairs, and Precast Toppings	4000	2-4	0.75	540	No	(6)
All Exterior Walls, Piers	4500	2-4	0.75	646	Yes	(1)(6)
Columns, Piers (Isolated)	4000 (INT)	2-4	0.75	564	No	
	4500 (EXT)	2-4	0.75	646	Yes	(1)
Interior Slab on Grade	4000	2-4	---	540	No	(2)(5)
Exterior Slab on Grade, Stairs, Equipment Pads	4000	2-4	---	587	Yes	(1)(2)(5)
Masonry Grout	3000	Varies	0.375	494	No	(4)
Floors on Metal Form Deck	3000	2-4	0.75	470	No	(19)
Miscell. Non-Sched. Interior Concrete Work	4000	2-4	0.75	540	No	

Type of Construction	Min. Comp. Strength at 28 day (U.N.O.) PSI	Max. Slump In.	Max. Agg. In.	Min. Cement Lbs/C.Y.	Air En-trained	Footnotes
Cooler/Freezer Slabs on Grade	4000	2-4	---	540	No	(2)(5)(18)

**FOOTNOTES:**

- (1) Air entrained concrete: Use for all exterior slabs, walls, walks, platforms, ramps, steps, all portions of parking ramps, and all other concrete exposed to freezing and thawing. Maximum water/cementitious ratio = 0.45. Conform to Exposure Class F2.
- (2) Minimum compressive strength at 3 days: 1800 psi. Maximum aggregate size shall not exceed one third of the slab on grade thickness. Coordinate with Contractor as to project schedule. Reduce water/cementitious ratio to 0.40, with MRWR or HRWR, to achieve required water vapor emission rates for installation of finish materials.
- (4) See Specification 04 10 00 for masonry grout requirements. MRWR required.
- (5) For slabs on grade, provide a low shrink, low curl mix with well-graded aggregates without gaps, lower sand in mix, and a proven history of performance. Reduce water/ cementitious ratio (0.40 to 0.50) as required. Use high quality admixtures with lower shrinkage and curl properties compared to comparable alternatives. Coordinate with and receive written approval from supplier of floor hardeners and any other finish floor material for mix design and materials. Test performance of cements from various suppliers.
- (6) Where slabs or walls are built monolithic with columns or piers, and where columns or piers are specified with higher strength concrete, mix shall conform to column requirements, unless noted otherwise.
- (9) Maximum water/cementitious ratio = 0.40 for Watertight Construction. Conform to Exposure Class C2. Provide Crystalline Waterproofing Admixture at a dosage of 2-1/2% by weight of Portland cement plus 2-1/2% by weight of slag, or as recommended by manufacturer, whichever is greater. For tunnel bottom slab, rate may be reduced to 2% by weight where nominal slab thickness is 36" or greater, or as recommended by manufacturer, whichever is greater. Air entrainment may be omitted when not subject to freeze/thaw.
- (14) Use pea gravel.
- (16) Provide shrinkage-reducing admixture at the rate of 1.5 gal./cu. yd. with MRWR required. Provide 7-1/2 lbs./cu. yd. Novamesh 950 or equal, with 0.45 maximum water/ cementitious ratio. Stone aggregate shall be well graded. Limit fines to reduce shrinkage. See slab-on-grade notes. For exterior applications, provide 6% air entrainment and reduce W/C ratio to 0.40.
- (18) For slabs-on-grade inside coolers and freezers, concrete shall contain Crystalline Waterproofing Additive, at a dosage rate of 2-1/2% by weight of Portland cement and slag or as recommended by manufacturer, whichever is greater.
- (19) For metal pan stairs and landings, mix shall contain 4 lbs./cu. yd. of macro-synthetic fibers.

**C. Additional Mix Requirements**

1. Cement content specified above is minimum, except:
  - a. If concrete mix test results in accordance with ACI 318 Section 5.3 indicate strength greater than that specified, reduction of specified cement content is allowed.
  - b. Should test results indicate strength below that specified, additional cement shall be added without cost to Owner.
2. Fly Ash may be used as a pound for pound replacement of cement up to 20% of the total cementitious content, 25% for footings, except for finished flatwork during winter construction, subject to Architect's approval.
  - a. Mixes shall develop sufficient strength to meet contractor's schedule for flatwork finishing and formwork removal. Adjust proportions of fly ash as required.
  - b. Not allowed for polished concrete.
3. Slag may be used as a pound for pound replacement of cement up to 30% of the total cementitious content, 25% for exterior slabs-on-grade, subject to Architect's approval.
  - a. Mixes shall develop sufficient strength to meet contractor's schedule for flatwork finishing and formwork removal. Adjust proportions of slag as required.
  - b. Not allowed for polished concrete.

4. Combinations of Slag and Fly Ash, (with a minimum ratio of 1 part slag to 1 part fly ash, higher proportions of slag are acceptable), may be used as a pound-for-pound replacement of cement as follows:
    - a. Footings: 50% of the total cementitious content.
    - b. All other: 30% of the total cementitious content, except for finished flatwork during winter construction.
    - c. Mixes shall develop sufficient strength to meet contractor's schedule for flatwork finishing and formwork removal. Adjust proportions of fly ash and slag as required.
    - d. Not allowed for polished concrete.
  5. For architectural exposed-to-view concrete columns, such as at canopies, and walls, mixes shall include plasticizers and/or other additives to minimize honeycombing and to improve finish and appearance. Use of slag cement to whiten concrete is required.
  6. Air-Entrained Concrete:
    - a. Concrete requiring air entrainment shall contain six (6) percent plus or minus one and a half (1.5) percent air by volume, (at end of discharge hose if pumped) for 3/4" dia. aggregate. Conform to ACI 318, Chapter 4. Give proper consideration to the reduction of air content when fly ash is used. Hard-troweled interior floors shall not contain more than 3% entrained or entrapped air.
  7. Use of synthetic fibers shall not change water requirement of mix. Slump loss due to addition of fibers shall be offset by the addition of a high or mid-range plasticizer. Adjust mix for increase in air content from fibers.
- D. Admixture Usage:
1. All concrete must contain the specified water-reducing admixture or water-reducing-retarding admixture and/or the specified mid-range or high-range water-reducing admixture (superplasticizer).
  2. Specified cement contents shall be increased 10 percent (10%) when no water-reducing admixtures are used.
  3. When temperature is at or below 40 degrees F when placing or within next 24 hours, all concrete, less than 8" in thickness, shall contain the specified non-corrosive, non-chloride accelerator.
  4. All concrete required to be air entrained shall contain an approved air entraining admixture.
  5. All pumped concrete, synthetic fiber concrete, concrete for wall pours exceeding 14 feet in height or with high rebar congestion which makes consolidation difficult (bars at 4" on center or less), concrete required to be watertight and concrete with a water/cementitious ratio below 0.41 shall contain the specified site applied high-range water-reducing admixture (Superplasticizer). Mid-range plasticizers may be substituted for high-range when water-cementitious ratios exceed 0.41. Do not use HRWR or MRWR at the batch plant.
  6. When high temperatures and/or placing conditions dictate and/or when concrete temperatures exceed 80 degrees F. use a water-reducing-retarding admixture (Type D) in lieu of the water-reducing admixture (Type A).
  7. Admixture Certifications must be submitted with the proposed mix design for review by the Architect.
  8. No other admixtures will be permitted without prior approval from the Structural Engineer.
- E. Measuring Materials: Cement, aggregates, water and admixtures shall be measured and combined strictly in accordance with ASTM Specification C94.
- F. Mixing and Delivery:
1. Ready-mixed concrete shall be mixed and delivered to point designated by means and standards set forth by ASTM Specification C94.
  2. Mixers and agitators may be examined by a representative of Owner for changes in conditions due to accumulation of hardened concrete or mortar or through wear of blades.
  3. When concrete is mixed in a truck mixer loaded to its maximum rated capacity, number of revolutions of drums or blades at a mixing speed shall not be less than 70 or more than 100.
  4. When a truck mixer or a truck agitator is used for transporting concrete, concrete shall be delivered to site of work, and discharge shall be completed within one and one-half (1-1/2) hours or before drum has revolved a total of 300 revolutions, whichever comes first, after

introduction of mixing water to the cement and aggregates, or mixing of cement and aggregates, unless a longer time is specifically authorized by Architect. In hot weather, or under conditions contributing to quick stiffening of concrete, concrete delivery and discharge shall be completed within 45 minutes.

5. Water may be added one time on the job site in the presence of a testing laboratory representative, to bring the slump to the specified level, but not to exceed 1 gallon per cubic yard and prior to any superplasticizer use. Such addition shall not increase the water-cementitious materials ratio above the maximum permitted by the specifications. Mixing time shall be appropriately increased with a minimum of twenty (20) revolutions of the drum. The maximum slump shall not be exceeded with the addition of water. Concrete with higher slumps will be rejected. Contractor may exceed specified slump only if a superplasticizer is used. Amount of water added on the jobsite shall be recorded on each delivery ticket and concrete test report. All slump tests shall be taken after all water has been added. Water shall not be added to the batch at any later time.
6. Drivers may not wash concrete trucks, or discharge water at any time into pump hoppers used for concrete pumping operation.

### **PART 3 - EXECUTION**

#### **3.01 FIELD QUALITY CONTROL**

- A. Samples of concrete shall be obtained in accordance with ASTM Method C172 and shall be transported to a place on site where cylinders can be made and stored without being disturbed during first 24 hours.
- B. Slump tests shall be performed in accordance with ASTM C143. Make one slump test of the first truck of each mix, each day, one test for each compression test and other tests as often as required thereafter, whenever consistency changes.
- C. When air-entrained concrete is used and for interior floors with hardeners/densifiers, air content tests shall be made from the first truck of each mix, each day and whenever test cylinders are made, in accordance with ASTM C173 or ASTM C231. Test more often when required air contents are not achieved.
  1. For pumped concrete, air content tests shall be performed at point of discharge in addition to at the truck; once at the beginning of each pour and whenever the pumping orientation is significantly altered. Air contents shall be adjusted at the batching point as required.
  2. Air entraining admixture may be added at the jobsite when air content tests too low.
  3. Concrete shall be rejected when air contents exceed 3% for interior floor applications.
- D. Concrete Temperature: Test hourly when air temperature is 40 degrees F (4 degrees C) and below, and when 80 degrees F (27 degrees C) and above; and each time a set of compression test specimens is made.
- E. If measured slump, air content, or concrete temperature falls outside limits specified, a check test shall be made immediately on another portion of same sample. In event of a second failure, concrete shall be considered to have failed to meet requirements of specifications and shall not be used in structure. Notify Architect immediately.
- F. Cylinders for strength tests shall be made in accordance with ASTM Method C31. During first 24 hours all laboratory test specimens shall be covered and kept at air temperatures between 60 and 80 degrees F (16 and 27 C). At the end of 24 hours, specimens shall be carefully transported to testing laboratory where molds shall be removed and cylinders shall be cured in a moist condition of 65 to 75 degrees F (18 to 24 C) until time of test. Strength tests shall be made frequently at direction of Architect. In no case shall any given class of concrete be represented by less than five (5) tests for entire job.
- G. A strength test for any class of concrete shall consist of standard cylinders made from a composite sample secured from a single load of concrete in accordance with ASTM C172.
  1. All concrete less than 6000 psi:
    - a. After 24 hours four cylinders shall be carefully transported to the testing

- laboratory for moist curing.
  - b. One laboratory cured cylinder shall be tested at 7 days and two laboratory cured cylinders to be tested at 28 days; retain one cylinder for later testing, if necessary.
- H. Strength tests shall be made for each of the following conditions:
  - 1. Each day's pour
  - 2. Each class of concrete
  - 3. Each change of supplies or source
  - 4. Each 150 cubic yards of concrete or fraction thereof
  - 5. Each 5000 square feet of surface area for slabs or walls.
- I. To conform to requirements of this Specification, the strength level shall be considered satisfactory so long as the average of all sets of three (3) consecutive strength test results equals or exceeds the specified  $f'_c$  and no individual strength test result falls below the specified strength  $f'_c$  by more than 500 psi when  $f'_c$  is 5000 psi or less; or by more than  $0.10f'_c$  when  $f'_c$  is more than 5000 psi. Architect shall be notified immediately of nonconformance.
- J. A record shall be made by a representative of testing laboratory of delivery ticket number for particular batch of concrete tested and exact location in work at which each load represented by a strength test is deposited.
- K. Additional field-cured cylinder tests, in-place cylinders, non-destructive testing, and/or maturity testing may be performed, at Contractor's option and expense, to determine early strength of concrete to facilitate form or shoring removal and shorten construction schedules.
- L. If, in the opinion of Architect, concrete of poor quality has been placed, additional tests shall be made as directed. Concrete quality shall be based on visual inspection of the concrete and review and analysis of the cylinder strengths. Additional tests shall be at the expense of Contractor. Tests may be compression tests on cored cylinders obtained by the Testing Laboratory per ASTM C42 or load tests per ACI 318 or as recommended by the Testing Laboratory and directed by the Architect. All testing costs chargeable to Contractor will be obtained from him by means of a credit change order to the Contract.

### **3.02 PREPARATION**

- A. Notification:
  - 1. Upon completion of forms and placing of reinforcing steel and before concrete is poured, notify all Contractors and Rebar Inspector allowing them reasonable time to complete their work.
  - 2. Notify Rebar Inspector at least 48 hours in advance before pouring any unit of structure.
- B. Protection of Adjacent Work:
  - 1. This Contractor shall be responsible to see that due care is exercised to avoid staining any adjacent finished material during concrete work. Any such damage shall be repaired in a manner subject to approval by A/E and Owner by this Contractor without expense to the Owner.
  - 2. Contractor shall be responsible for protection of footings subject to freezing temperatures by covering completed and/or existing work at footing level with sufficient temporary or permanent cover as required to protect footings and adjacent subgrade against the possibility of freezing; maintain cover for the time period as necessary.
- C. Preparation:
  - 1. Before Placing Concrete:
    - a. Clean all mixing and transporting equipment.
    - b. Remove all ice, snow, dirt, chips and other debris from forms or place to receive concrete.
    - c. Flush and wet down forms thoroughly to close any cracks between boards.
    - d. Wet down subgrade with as much water as it will absorb readily. Remove standing water.
    - e. Do not place concrete in dry forms or on dry subgrade.

### 3.03 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
  2. Place all concrete in accordance with ACI 304, ACI 304.2R and ACI 302 for slabs. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
  3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
  4. Crane or dump bucket may be used to transport concrete where concrete cannot be delivered to forms directly from chutes, into forms, wheelbarrows or two (2) wheeled concrete carts.
  5. Specified superplasticizers, or approved alternative admixtures, are required in the concrete mix if concrete pumping is used for placement.
  6. Delivery carts or buggies and/or pumping equipment shall be kept on temporary runways built over floor systems. Runway supports shall not bear on reinforcing steel or fresh concrete.
  7. Concreting operation shall not alter location of reinforcing bars. Extreme care by workmen is required. Do not drag or drop equipment, such as pumping hose on reinforcement.
  8. In no case shall concrete be delivered or placed with a free fall exceeding 10 feet for concrete containing superplasticizer, 15 feet for self-consolidating concrete (SCC) or 5 feet for other concrete. Spreading of concrete with hoes and shovels for distance greater than 6'0" from delivery end of chutes, carts or buggies is not permitted.
  9. Consistency of concrete to be such that it will be:
    - a. Uniform throughout with mortar clinging to coarse aggregate;
    - b. Plastic enough that concrete will work readily into corners and angles of forms and around reinforcement without excessive puddling or spading and without segregation of material or collecting of free water on surface while transporting or placing.
    - c. Of sufficient mortar content in mass to fill all voids, prevent harshness or honeycombing in the structure and uniform distribute coarse aggregate.
  10. Concrete shall be deposited in such a manner as to secure most thorough consolidation. Vibration with an approved "spud" type internal vibrator with flexible shaft shall be used where possible. Vibrator shall not come in contact with reinforcing or forms. Use and type of vibrators shall conform to ACI 309.
- C. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  2. Maintain reinforcement in position on chairs during concrete placement.
  3. Screed slab surfaces with a straightedge and strike off to correct elevations.
  4. Slope surfaces uniformly to drains where required.
  5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- D. Concreting In Cold Weather:
1. Follow ACI 306R and 306.1 for mixing, placing and protection, and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost,

freezing actions, or low temperatures. All costs associated with cold weather concreting are incidental to Contractor's lump sum base bid, with no additional cost to the Owner.

- a. When temperature is at or below 40 degrees F (4 C) when placing and for at least 72 hours afterward.
- b. Temperature of all surfaces in contact with newly placed concrete (including formwork, rebar, subgrade) shall be a minimum of 37°F and shall not be more than 10°F higher than minimum concrete placement temperatures specified in ACI 306R.
- c. Provide heated concrete material with temperature of concrete when placed as recommended by ACI guidelines.
- d. Only the specified non-corrosive non-chloride accelerator shall be used. Calcium chloride is not permitted.
- e. Do not place on frozen subgrades.
- f. Do not place concrete when the air temperature does not exceed 10°F during the day.
- g. Provide adequate housing covering and heating for freshly placed concrete for a minimum period of 72 hours after placing; maintain temperatures above 55°F. Do not allow carbon dioxide from heating units to contact freshly placed concrete surfaces for a minimum of 48 hours. Vent all heaters outside of any enclosure.
- h. All footings, walls, grade beams, piers and slabs on grade shall be protected from the penetration of frost by use of heaters, insulation, backfill, enclosures or other means. This protection shall exist throughout the entire construction period. Architect may inspect the frost penetration during construction. If frost is within 6 inches of the bottom of any construction in place, the Contractor shall take immediate steps to insulate or heat to prevent further frost penetration.
- i. If the protection provided by Contractor is inadequate and frost penetration extends beneath the bottom of the construction, this shall be a basis for rejecting that portion of the work. This rejected work shall be removed and properly replaced at the expense of Contractor.

2. Contractor's Responsibility: Repair or replace, in manner acceptable to Architect, all concrete work damaged due to water, snow, freezing, excessive heating and too rapid drying out.

E. Hot Weather Concreting:

1. Conditions warranting hot weather concreting practices are defined as any combination of high air temperature, low relative humidity and wind velocity tending to impair the quality of fresh or hardened concrete or otherwise result in abnormal properties. Place concrete, cure and protect in compliance with ACI 305.1, Specification for Hot Weather Concreting. Do not place concrete when the air temperature is expected to reach 90° F or greater when placing or within next 24 hours. All costs associated with hot weather concreting are incidental to Contractor's lump sum base bid, with no additional cost to the Owner.
2. Temperature of concrete when placed shall not be less than 50 degrees F nor exceed 85 degrees F. Control by:
  - a. Cooling aggregates;
  - b. Using cement with maximum temperature of 170 degrees F (77 C);
  - c. Using cold water or ice.
3. Sprinkle forms, subgrade and reinforcing with cool water prior to placing concrete. Keep buggies, chutes and other equipment shaded.
4. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that the steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
5. Mixing, Placing and Protection:
  - a. Keep mixing to minimum requirement which will insure adequate quality.
  - b. Do not expose mixers to hot sun.
  - c. Use concrete promptly.
  - d. Provide fog spraying operation immediately following placement and prior to final curing.
  - e. Finish promptly.
  - f. Protect and cure properly.
  - g. Do not use retarding agents unless approved by Architect.
  - h. Maintain concrete temperature not less than 50 degrees F nor more than

90 degrees F for the first three days after placing. Protect from temperatures over 90 degrees F for the next five days.

6. When high temperatures and/or placing conditions dictate, use a water-reducing-retarding admixture (Type D) in lieu of the water-reducing admixture (Type A).
- F. Evaporation Retardant: During rapid drying conditions (high concrete or ambient temperatures, low humidity, high winds, direct sunlight, etc.) apply a concrete evaporation retardant to minimize plastic cracking. The compound may be required to be applied one or more times during the finishing operation. The initial application is usually made after the strike-off operation.
  1. Use is subject to approval of membrane or sealer manufacturer.

### **3.04 CONCRETE JOINTS**

- A. Use and location of expansion, contraction, control and construction joints as approved by Structural Engineer or as shown on drawings. Location shall be indicated on the Shop Drawings. Construct joints true to line with faces perpendicular to surface plane of concrete. All exposed concrete joints shall be tooled and sealed.
- B. Plumb bulkheads with keys at least 1-1/2" deep shall be used at all joints.
- C. In no case shall pours be stopped at points that would impair strength of structure. Horizontal joints are not permitted within the height of a structural member, e.g. columns, footings, beams, floor systems.
  1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
  2. Locate joints for beams, slabs, joists, and girders in the middle third of spans, unless noted otherwise.  
Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
  3. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
- D. Clean and roughen concrete surface to a 1/2" amplitude for wet concrete, to 1/4" amplitude for set concrete. Slush with neat cement grout immediately before placing additional concrete.
- E. Install specified waterstop in all construction joints for below-grade basement walls in contact with earth.

### **3.05 EXPANSION/ISOLATION JOINTS, CONTROL JOINTS AND WATERSTOPS**

- A. At joints between slabs on earth and vertical surfaces, including columns, piers and walls, provide pre-molded joint filler strips. Before placing concrete, set isolation joint material in designated areas. Top of joint material shall be level to 1/4" below finished surface of concrete. Provide adequate means to maintain proper positioning of joint material during concrete placement. The minimum depth of isolation joint material shall be equal to the smaller of the concrete slab thickness with which it comes in contact. At exterior applications, install sealant above filler strips.
- B. Control (contraction) joints shall be provided in all slabs on earth by means of 1/8" to 1/4" wide saw cuts to a depth of 1/4 slab thickness when using conventional saws, 1.25" for soft cut saws, as directed by Architect or as shown on structural drawings, whichever is more restrictive. Where joints are filled with polyurethane sealants, minimum 1/4" wide joints are required. Saw cutting of concrete shall be minimized. If necessary, saw cut while concrete is "green" to minimize dust and provide for better quality control. Provide dust barriers during cutting operations. Vacuum/ clean surfaces following cutting operations to reduce residual concrete dust.
- C. Per manufacturer's exact specification, fill exposed slab-on-grade joints with specified elastomeric sealant.
  1. Required at exposed concrete surfaces including interior slabs, exterior driveways, garages, parking areas, and parking structure slabs on grade.



- D. Building expansion joints shall be constructed as detailed. Install specified waterstop, joint filler and sealant in accordance with manufacturer's specifications.
- E. Waterstops:
1. Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.
  2. Install per manufacturer's requirements.
  3. Locate as detailed in all construction and expansion joint types as specified.
  4. Place in continuous lengths in walls and on top of footings where shown on plans to provide a watertight seal.
  5. PVC butt joints and factory fabrications shall be joined in field without misalignment by heat sealing, without charring in accordance with manufacturer's instructions using approved welding irons. Lapping waterstops, use of adhesives, or solvents is not allowed.
  6. Prior to concrete placement of first pour, attach PVC waterstops firmly to adjacent reinforcement and/or formwork to insure that waterstop will not be displaced or bent during concreting operations. Center waterstop in joint. Use punched holes or grommets with hog rings or other approved method spaced at 12" on center. Do not fold waterstops at joints. Provide split-form bulkheads as required. Do not "wet set" waterstops.
  7. Provide super glue for all splices of bentonite and hydrophilic waterstops.
  8. Consolidate concrete by vibration on each side of the PVC waterstop to provide continuous bond and contact.
  9. PVC Waterstop splicing defects which are unacceptable include, but are not limited to the following:
    - a. Tensile strength less than 80 percent of parent section.
    - b. Misalignment of centerbulb, ribs, and end bulbs greater than 1/16 inch.
    - c. Bond failure at joint deeper than 1/16 inch or 15 percent of material thickness.
    - d. Misalignment that reduces waterstop cross section more than 15 percent.
    - e. Visible porosity in the weld.
    - f. Bubbles or inadequate bonding.
    - g. Visible signs of splice separation when cooled splice is bent by hand at a sharp angle.
    - h. Charred or burnt material.

### **3.06 CONCRETE CURING AND PROTECTION**

- A. General:
1. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures in conformance with ACI 301 and ACI 308. After placement and prior to finishing of slabs, contractor shall use evaporation retardants, fogging, windscreens, etc. to prevent plastic shrinkage cracking caused by excessive drying of the top surface. For surfaces floated and broomed, place curing compound immediately where allowed, or cover with moisture absorptive or retaining covers as specified below.
  2. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Keep continuously moist for not less than 24 hours.
  3. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI procedures. Avoid rapid drying at end of final curing period.
- B. Curing Methods: Perform curing of concrete by curing compound, curing and sealing compound, by penetrating colloidal concrete treatment, by moist curing, by moisture-retaining cover curing and by combinations thereof, as herein specified.
1. Provide moist curing by following methods:
    - a. Keep concrete surface continuously wet by covering with water.
    - b. Continuous water-fog spray.
    - c. Cover concrete surface with specified burlap moisture absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges with 4" lap over adjacent absorptive covers.
  2. Provide moisture-retaining cover curing as follows: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any

- holes or tears during curing period using cover material and waterproof tape.
- a. For exposed concrete, the specified Moisture Retaining Cover, Moisture Absorptive Cover, or other wet curing options shall be used. Concrete shall be cured by methods other than use of smooth plastic film, which results in a mottled appearance.
- 3. Provide curing compound, curing and sealing compound or penetrating colloidal concrete treatment to slabs as follows:
  - a. Apply, per manufacturer's specification, to concrete slabs, including construction joints, after form removal as soon as final finishing operations are complete (within two hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to rainfall within three (3) hours after initial application. Maintain continuity of coating and repair damage during curing period. Cover with moisture retaining cover for 48 hours.
  - b. Exterior slabs shall have fugitive dye or pigment. Interior slabs may be clear or with pigment as required by Architect.
  - c. Apply at dosage rates per Manufacturer's written recommendation.
  - d. Remove curing and sealing compounds by Blastrac when flooring adhesives or bonding agents are used. Blastrac is not required for colloidal treatment.
  - e. All exterior surfaces (slabs, floors, walls and columns) and interior surfaces (when other curing methods are not used) shall be sealed.
- C. Coordinate curing methods with finish flooring contractor and manufacturer. Unless permitted in writing by finish flooring manufacturer, and approved by Architect, only moist curing is permitted during initial curing period for all floors where terrazzo, urethane, epoxy floor coatings or chemical hardener are scheduled, and for floors to receive moisture sensitive flooring materials.
- D. Final cure concrete surfaces to receive liquid floor hardener by use of moisture-retaining cover, unless otherwise directed. See Room Finish Schedule and Section 03 35 00.
- E. Final cure, by use of moisture-retaining cover, floors scheduled to receive moisture-sensitive flooring materials including ceramic or quarry tile, vinyl composition tile, carpet or other "glue-down" finish flooring. Test and prepare in conformance with ACI 302.2, other sections of this specification, flooring manufacturer and industry recommendations.
- F. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable. Vertical construction such as walls, columns, beam sides, etc. shall, if forms are removed in less than seven (7) days, be given a spray coat of liquid curing compound at rate recommended by manufacturer.
- G. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor toppings and other flat surfaces by application of appropriate curing method.

### 3.07 TOLERANCES

- A. The construction tolerances for cast-in-place concrete shall meet the requirements of ACI 117 and 347 and the special project tolerance requirements listed in this section. Where requirements conflict, the more stringent shall govern.
  - 1. Tolerances are not cumulative. The most restrictive tolerance shall control.
  - 2. Linear and Vertical Lines (When Forms are Stripped):
    - a. Perimeter column centerlines shall be within + or - 1" of established lines, when column edge is interior to slab edge. When column edge matches slab edge: match slab edge tolerance.
    - b. Perimeter slab edges shall be within + or - 1/2" of established lines.
    - c. Floor to floor dimension shall be within + or - 1/4" of established dimension.
  - 3. Plumb (when forms are stripped, except where otherwise specified):
    - a. Lines and surfaces of columns and walls shall be within 0.3% times the clear height.

- b. ACI 117 Requirements for buildings less than or equal to 83'-4" in height, shall apply to the full height of the structure. Upon completion of building, the entire height shall be plumb to the lesser of 0.3% times the height above top of foundations or +/-1", except exposed columns and walls shall be plumb to 1/2".
- 4. Elevations:
  - a. Top of slab at columns shall be within + or - 3/8" of established elevations.
  - b. Top of slab at perimeter edge shall be within + or - 3/8" of established elevations.
  - c. The top of slab at the center of a span shall be within + or - 3/8" of established elevations.
  - d. The top of slab at the center of a bay shall be within + or - 3/8" of established elevations.
  - e. For shored construction, values apply before forms and shores are stripped.
- 5. Formed Opening:
  - a. Lesser of window or door tolerances or:
  - b. Width or height: + or -1/2"
  - c. Size: +1/2" or -1/4"
  - d. Centerline location: + or -1/2"
- 6. Embed plate location: + or -1" for vertical or horizontal alignment.
- 7. Slab Thickness: - 1/4" maximum.
- 8. Conflicts between concrete tolerances and structural deflections, structural steel tolerances, window and curtain wall requirements, cladding, and other building elements shall be resolved with Architect and respective suppliers/installers/trades in a pre-construction meeting. Failure to do so shall negate any monetary compensation for change orders, or any schedule extensions.

B. Floor Slab Flatness and Levelness Tolerances: Finished floor slabs are required to meet the following Specified Overall Values (SOV) and Minimum Local Values (MLV).

Floor use Category	Examples	Flatness, F <sub>F</sub> : SOV	Flatness, F <sub>F</sub> : MLV	Levelness, F <sub>L</sub> : SOV	Levelness, F <sub>L</sub> : MLV
Supported Floors with Improved Flatness and Levelness	Thin-set Flooring, Resilient Floor Covering	35 (Typical unless noted otherwise.)	25	25	17
Slabs-On-Grade with Improved Flatness and Levelness	Thin-set Flooring, Resilient Floor Covering	35 (Typical unless noted otherwise.)	25	25	17
Gymnasium Floors	--	45	35	35	28
Exterior Slabs-On-Grade	Parking and Drive Areas	20	12	15	9

- 1. "Supported Floors", as used in this Specification, shall mean any floor above the slab on grade; concrete, precast or steel construction; shored or unshored.
  - a. The F<sub>L</sub> values listed for supported floors only apply to shored construction.
  - b. For unshored construction:
    - 1) 80% of the elevation points measured on an unshored slab shall fall within a 3/4-inch envelope centered on the mean of the data collected using ASTM E1155.
    - 2) The mean of the elevation data collected shall be within 3/8-inch of the design elevation.
- 2. During concreting, provide additional concrete to account for deflection of structural members under the dead load of the concrete. Set perimeter forms and check finished surface with optical or laser instruments. Do not set screeds to maintain a uniform slab thickness. For unshored, elevated surfaces, use rigid screeds instead of wet screeds. Set screeds at high points. Place slabs level as slab deflects. Use 10 foot straightedges.

3. Testing Agency, hired by the Contractor, shall measure, verify and report floor flatness in accordance with ASTM E1155 within 24 hours after concreting operation, including ADA accessible surfaces. Provide written reports to Architect and Structural Engineer.
4. Concrete contractor is responsible for the cost of grinding and leveling after concrete has cured.
5. Conform to F-numbers specified for floor areas within 2 feet of construction and isolation joints, in lieu of ASTM E1155 requirements excluding these areas.

### **3.08 UNDER-SLAB VAPOR BARRIER/RETARDER**

- A. Location: Under all interior slabs on grade, including industrial and manufacturing floors, unless otherwise noted. Do not provide a vapor barrier/retarder at parking garages.
- B. Subgrade Preparation: Installation shall not begin until a proper base has been prepared to accept the membrane lining.
  1. Subgrade drainage fill shall be installed, compacted, suitably smoothed with sand so as to prevent perforation, free of ruts, and shall be tested and approved by Geotechnical Engineer in conformance with the Earthwork Section of this specification.
- C. Installation: In strict accordance with manufacturer's instructions and specifications and ASTM E1643, in order to create a monolithic membrane, including:
  1. Unroll Vapor Barrier with the longest dimension parallel with the direction of the pour. Completely cover the floor area.
  2. Lap Vapor Barrier over footings, turn up edges, and seal to interior columns, foundation walls and piers with Stego "Crete Claw", "Tack Tape" or other tape specifically designed and supplied by manufacturer to attach and seal retarder to concrete. Seam tape is not allowed.
  3. Overlap joints a minimum of 6 inches and seal with manufacturer's tape. Repair as required.
  4. Seal all penetrations (including pipes, other utilities, and columns) with manufacturer's pipe boot or other approved methods.
  5. Where tape or other material is used, surfaces shall be clean and dry, free from dust, dirt, and moisture to allow maximum adhesion. When taping, minimum surface temperature shall be 50-60°F. At lower temperatures, external heat may be applied to maintain such temperature for 24 hours. Do not install tape when temperatures are below 32°F.
  6. No penetration of the vapor barrier is allowed. Do not drive stakes through vapor barrier. All pipe, ducting, rebar, wire penetrations and blockouts shall be sealed.
  7. Use only concrete brick type reinforcing bar supports or provide 6 x 6 in. protective pads recommended by manufacturer to protect from puncture.
  8. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area a minimum of 6 inches in all directions and taping all four sides with tape.
  9. Repair any surfaces or taped edges damaged during construction activity or concrete placement. Membrane shall be dry prior to concreting operations.
  10. Workers, including concrete finishers, shall not poke holes in vapor barrier.
  11. Vapor Barrier installation must be approved prior to concrete placement by Testing Agency with a report to Architect and Structural Engineer. See Section 31 00 00.

### **3.09 INSULATION**

- A. Perimeter Insulation:
  1. When backfill is being placed and before floor slabs are poured, install specified insulation of thickness shown on drawings.
  2. Insulation shall extend vertically on walls as shown on drawings.
  3. Apply against walls using specified adhesive if necessary to hold in place.
  4. Apply after waterproofing membrane is in place.
- B. Insulation Below Concrete Slabs:
  1. Install high density insulation to the thickness as shown on drawings per manufacturer's recommendations.

### 3.10 SLABS

#### A. General:

1. Obtain Architect's approval of all underslab gravel beds, formwork, reinforcement and any work that will be embedded in concrete before placing concrete.
2. Make necessary allowance so that all floor finish material can be installed within finish floor levels designated.
3. Provide recesses for urinals as directed by Plumbing Contractor, for mortar set tile, at recessed entries, etc., coordinate with architect for location.
4. Strike and level concrete. Provide additional concrete as required to account for structural deflections for slabs on metal deck systems. Slab thickness specified on the drawings is the minimum nominal thickness. Allow to set before floating. Bull float on disappearance of water sheen. Hand float areas inaccessible to bull float. This is applicable to all flat work to obtain a smooth, uniform, granular texture. Floors shall conform to specified tolerances including flatness and levelness except where drains occur or sloped floors are indicated, in which case the tolerance applies to the planes indicated.
5. Provide necessary pitch to drains. Coordinate with Architect for rate of pitch, unless specified. Floors shall slope as required to floor drains to eliminate ponding of water. Areas which do not drain properly shall be removed and replaced at the Contractor's expense.
6. Conform to ACI 302.2 where moisture-sensitive flooring materials are used. Moisture, Relative Humidity (RH) and Ph testing shall conform to ASTM standard test methods performed by qualified testing technicians. Test results shall not exceed flooring manufacturer's limits.

#### B. Slabs on Gravel Beds:

1. Make sure all underslab work is completed.
2. Check gravel underbed for compaction by proofrolling, proper levels and pitches to drains as required.
3. Place insulation and underslab vapor barrier/retarder.
4. Pour slabs to required levels and thickness shown in one (1) monolithic operation with joints as designated and as before specified.

#### C. Finishes: (See Room Finish Schedule)

1. All slabs where waterproofing membranes, resilient tile, epoxy terrazzo, thin set ceramic tile or cement finish is scheduled, follow up immediately with machine float troweling and finish to a smooth uniform level, free from depressions and tool marks.
2. Floors scheduled for urethane finish shall have a light broom finish.
3. Exposed concrete floors shall be steel troweled to a surface within slab flatness and levelness tolerances. Check drawings for slab depression to bring floors to correct elevation. Do not hard trowel exterior, air-entrained concrete.
4. Where standard terrazzo or mortar set ceramic tile floors are scheduled, slabs shall be screed finished.
5. Broom finish exterior walks, ramps, drives and stairs, parking slabs. Broom slabs transverse to the main direction of traffic. Finish to be approved by Architect. See architectural for special finishes, trowel edge paving borders, patterns, etc.
6. Edge Forms and Screeds for all finish floors shall be accurately, instrument set and finish floors shall be free of any irregularities and depressions. Any such irregularities shall be corrected by this Contractor and depressions shall be filled with latex cement or high spots ground down before ceramic or resilient tile work is installed.

- D. Where a trowelled finish is specified instead of broom finish, provide non-slip aggregate for entrance platforms, stairs and landings. Wet aggregate before applying and distribute evenly over surface at minimum rate of one-quarter (1/4) pound per square foot (1.25 kg/m<sup>2</sup>) of cement area and trowel.

### 3.11 STAIRS

#### A. Interior:

1. Of reinforced concrete as detailed, poured monolithically and finished as specified for slabs with resilient tile finish.

2. Metal Stairs and Landings: Fill pans with concrete, same as specified for topping and reinforce with 2" x 2" (5 x 5 cm), 14/14 W.W.M and macro-synthetic fibers. Trowel smooth for application of rubber treads.
  3. Install non-slip nosings as furnished under Section 05 50 00 and non-slip aggregate.
  4. Construct rough concrete stair slabs as shown on drawings making proper allowance for terrazzo treads, risers and stringers.
- B. Exterior:
1. Construct with coves at all intersections and nosings slightly rounded. Slope risers in at bottom and pitch treads and platforms to drain.
  2. Apply non-slip abrasive aggregate to all stairs, landings and platforms to be trowelled finish instead of broom finished.
  3. Set sleeves for railing.

### 3.12 CONCRETE SURFACE REPAIRS

- A. Immediately after stripping formwork, inspect all surfaces of concrete. Face and corners of members shall be smooth and sound throughout.
- B. Repair tie holes and surface defects immediately after formwork removal. Where the concrete surface will be textured by sandblasting or bush-hammering, repair surface defects before texturing.
- C. Definition - Defective Areas:
1. Formed Surfaces: Concrete surfaces requiring repairs shall include all honeycombs, rock pockets and voids exceeding 1/4" in any dimension, holes left by tie rods or bolts, cracks in excess of 0.01" and any other defects that affect the durability or structural integrity of the concrete.
  2. Unformed Surfaces: Concrete surfaces requiring repair shall include all surface defects such as crazing, cracks in excess of 0.0625" wide or cracks which penetrate to reinforcement or through the member, popouts, spalling and honeycombs.
- D. Classification:
1. Structural Concrete Repair: Major defective areas in concrete members that are load carrying shall require structural repairs. Structural concrete repairs shall be made using a two part epoxy binder and/or epoxy mortar. Location of structural concrete repairs shall be determined by the Engineer. Contractor is responsible for engineering costs to provide repair details and specifications.
  2. Slab Repairs: High areas in concrete slabs shall be repaired by grinding after concrete has cured at least 14 days. Low areas shall be filled using self-leveling mortars. Repair of slab spalls and other surface defects shall be made using epoxy products as specified. Follow manufacturer's instructions including minimum thickness, supplemental aggregates and curing.
  3. Cosmetic Concrete Repair for Areas Not Exposed to View: Defective areas not exposed to view in concrete members that are non-load carrying and minor defective areas in load carrying concrete members shall require cosmetic concrete repair. Cosmetic concrete repairs may be made using a non-epoxy non-shrink patching mortar and bonding agent. Rout and seal with approved crack-filling compound large cracks in slabs on grade and slabs on metal deck. The location of cosmetic concrete repair required shall be determined by the Engineer.
  4. Defects to Architectural Concrete:
    - a. Architectural concrete shall be defined as exposed to view concrete surfaces where the aesthetic appearance of the structure is important, e.g. exterior facades, or interior areas exposed to public review.
    - b. Owner, Architect or Engineer may reject repairs to architectural concrete found to have unsightly cracking, chipping, finish, coloration, nonconforming tolerances or strength. Rejected repairs shall be replaced at Contractor's expense.
    - c. Acceptance of units, repaired pursuant to written approval, is contingent upon repairs being skillfully done so as to be sound, permanent, flush with adjacent surfaces and of color and texture matching similar adjoining surfaces and showing no apparent line of demarcation between original and repaired work.

- d. Where color match cannot be accomplished, stain large enough surfaces so member coloration is uniform.
  - e. Test Repairs: Prepare sample of each type of concrete repair to be performed.
    - 1) Mock-ups shall be performed in areas not subject to public view to demonstrate quality of materials and workmanship.
    - 2) Make up trial batches or repair material, in the form of cubes or cylinders, and allow to cure, to check color match. Adjust as required.
    - 3) Allow samples to cure at least three days before obtaining acceptance of color, texture and detailing match.
    - 4) Samples shall be viewed from an approved distance of 12 feet.
    - 5) Notify Architect and Owner if appearance of patches cannot match existing construction.
- E. Concrete Repairs:
- 1. Repairing and patching of existing concrete work shall be expertly performed with specified materials. At completion, patched surfaces shall match adjacent existing surfaces as closely as possible.
  - 2. Immediately prior to placing the repair material, inspect the repair cavity to verify that all bond-inhibiting materials (dirt, concrete slurry, loosely bonded aggregates or any material that may interfere with the bond of the repair material to the existing concrete) have been removed. If bond-inhibiting materials are present, the repair cavity should be re-cleaned. Blow surface with a compressed air jet.
  - 3. Surface preparation and repair materials shall be applied or installed where indicated, or where otherwise required, in accordance with the manufacturer's instructions, specifications and recommendations.
  - 4. Do not feather edges. Outline honeycombed or otherwise defective concrete with a 1/2 to 3/4 in. deep saw cut and remove such concrete down to sound concrete. When chipping is necessary, leave chipped edges perpendicular to the surface or slightly undercut.
  - 5. Dampen the area to be patched, plus another 6 in. around the patch area perimeter. Prepare bonding grout according to ACI 301 and thoroughly brush grout into the surface.
  - 6. Float, trowel, or texture surfaces to match adjacent existing surfaces.
  - 7. Repair concrete may not be placed when the ambient air temperature is below 50°F, unless approved by Engineer.
  - 8. Vibrate concrete as necessary to uniformly and thoroughly consolidate the entire mass of fresh concrete without causing segregation of the aggregate or the formation of localized areas of grout.
  - 9. Protect the repair mortar from freezing, premature drying, flowing water, mechanical injury and other areas under repair.
- F. Contractor shall repair any excessively large cracks that are unacceptable to finish flooring installer.

### **3.13 CONCRETE FINISHES OTHER THAN FLOOR FINISH**

- A. Patching:
  - 1. Leave entire surface of concrete smooth, even and uniform in color.
  - 2. Use specified bonding compound or epoxy adhesive.
  - 3. Fill form tie holes.
- B. Rubbed Finish:
  - 1. Provide rubbed finish for all concrete surfaces to be painted, or exposed to view not noted to receive any other finish, and all vertical faces of walls, stairs, ramps and platforms, except interior basement walls in parking areas. This shall also include all soffits of interior stairs.
    - a. Architect shall be notified to review exposed surfaces. Architect shall determine which surfaces may be omitted from rubbing operation based on quality of surface.
    - b. Before proceeding, rub 48" x 48" sample area for Architect's review and approval.
  - 2. For exposed exterior concrete walls, patch holes from form ties, honeycombing, and other irregularities in the finish. Grind joint marks, offsets and fins smooth with adjacent

- surfaces, to produce an architectural finish.
- 3. Provide rubbed finish on the earth-side face of walls to receive membrane waterproofing. Grind all projections flush with surface prior to rubbing.
- 4. Mix one (1) part Portland Cement with 1-1/2 parts fine white silica sand.
- 5. Apply grout with brush, completely filling all air bubbles and holes, and float with styrofoam, cork or similar float.
- 6. After grout had dried, rub with burlap to completely remove any dried grout.
- 7. Entire cleaning operation for any area must be completed day it is started. No grout shall be left on surface overnight.
- 8. After grout has cured, remove any visible film of grout with belt sander.
- C. Sandblasting (Where indicated on Architectural Plans):
  - 1. Exterior architectural concrete surfaces noted on drawings to receive sandblast finish.
  - 2. Sandblast to a medium finish with uniform color and texture.
  - 3. Before proceeding, sandblast sample area for Architect's approval.
- D. Leave entire surface of concrete smooth, even and uniform in color.
- E. Tops of concrete walls and ledges on which brick or stone will be placed to be finished to a level uniform surface with darby and float.

### 3.14 MISCELLANEOUS CONCRETE AND CEMENT WORK

- A. Openings in concrete slabs and walls for passage of ducts, etc. shall be as shown or detailed. Close entire open spaces between ducts and edges of concrete with stiff cement mortar as required. If area is too great to support mortar, install 2-1/2" (6.35 cm) concrete slab with proper forms and 3/4" (1.9 cm) rib lath or bar reinforcement.
- B. In all mechanical equipment rooms, provide minimum 4" (10 cm) high concrete curb around all openings through floor slabs, monolithic with floor slab or topping.
- C. Provide equipment bases where shown on drawings. (Check Mechanical, Electrical, Plumbing and other Specialty Plans.) Set anchor bolts, as may be required, through concrete base and anchor into structural slab. Unless otherwise indicated, extend base not less than 6 inches in each direction beyond the maximum distance of the equipment.
- D. Non-Shrink Grouting:
  - 1. Mixing shall be in strict conformity with manufacturer's specification.
    - a. Grout shall be comprised only of ready-to-use grouting material.
    - b. Use only minimum amount of water to produce flowable grout.
  - 2. Placing:
    - a. Install grout before placing any upper floors with concrete or precast.
    - b. Clean underside of column base plates of grease and oil and concrete surfaces of all laitance, debris, etc.
    - c. Grout shall be placed quickly and continuously by whatever means most practical.
    - d. Grout shall completely fill space to be grouted, be thoroughly compacted and free of air pockets.
    - e. After grout has acquired initial set, all exposed edges shall be cut off vertical with base plate.
  - 3. Cure in strict accordance with manufacturer's specification. Maintain temperature at a minimum of 40 degrees F (4 degrees C) until grout reaches 3000 psi.
- E. Grout elevator entrance sills with Portland Cement Mortar consisting of 1 part cement and 3 parts sand.
- F. Exterior and interior concrete sills and stools as detailed. Trowel finished.
- G. Flag Pole Base:
  - 1. Construct concrete base and install foundation tube, all in accordance with flag pole manufacturer's instructions, detail drawings and shop drawings.



2. Consult and work in cooperation with Contractor furnishing flagpole.
- H. Building sign monument as detailed.
- I. Install reglets to receive waterproofing, or flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, relieving angles, and other conditions.

### **3.15 CONSTRUCTION LOADS**

- A. During the construction period, the contractor shall provide means for the adequate distribution of concentrated loads so that the carrying capacity of any member, including metal deck, is not exceeded.
1. Review plans and consult with Architect to determine allowable uniform live loads.
  2. Contractor shall hire a Professional Engineer and/or contact steel deck supplier to determine the adequacy of concentrated loads, e.g. construction equipment point or wheel loads, in combination with other applied loads such as wet concrete and construction personnel, stored materials, etc.

### **3.16 FIELD CUTTING AND CORING**

- A. For new or existing construction, all field cutting or coring of openings shall be approved by the Structural Engineer and Testing Agency.
1. Locations of openings shall conform to structural plans where shown.
  2. Contractor shall hire a Testing Laboratory to exactly locate reinforcement using X-rays or other approved methods.
  3. Do not cut through any beams or joists, or through any concrete reinforcement, unless specifically approved by structural engineer.
  4. Do not over-cut openings. Do not cut deeper than required.
  5. If over-cuts occur, reinforcement or structural members are cut, or the structure is damaged, the contractor making the saw-cuts or coring shall be responsible for all repair costs including engineering services.
  6. These requirements shall apply to all trades doing such work including mechanical, electrical and plumbing.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

## SECTION 03 35 00

### CONCRETE HARDENER/SEALER

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

**Work Included:**

Labor and materials required to furnish and apply concrete hardener/sealer to slabs on grade (loading docks, police garage, sally port), 6" or thicker, and where floor hardener or sealer is scheduled in Architectural Room Finish Schedule.

##### **1.02 QUALITY ASSURANCE**

- A. Follow manufacturer's requirements and recommendations.
- B. Installer Qualifications: Applicator experienced with installation of product and certified by manufacturer, or applicator experienced with similar products and providing manufacturer's field technician on site to advise on application procedures.
- C. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.
- D. Coordinate work with concrete contractor. Only continuous moisture curing of concrete slabs for 7 days is permitted for slabs where a concrete hardener/sealer is scheduled. If a strippable or self-dissipating curing compound is approved in writing by Architect and Hardener/Sealer supplier, surface shall be shot-blasted prior to hardener/sealer installation. Refer to Section 03 30 00.

##### **1.03 SUBMITTALS**

- A. Provide to Architect and Concrete Contractor material requirements for concrete to which hardener/sealer is to be applied, including cement type, water-cementitious ratio, type of trowel finish, limitations on admixtures, pigments, bonding agents, and bond breakers, etc.
- B. Provide manufacturer's data sheets, including product specifications, test data, preparation instructions and recommendations, storage and handling requirements and recommendations, and installation methods.
- C. Provide to Owner maintenance instructions, including precautions for avoiding staining after application.

##### **1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver hardener/sealer product in factory numbered and sealed drums, with numbers recorded for Owner's records.
- B. Store hardener/sealer products in manufacturer's unopened drums until ready for installation.
- C. Deliver strippable curing compound in manufacturer's sealed packaging, including application instructions.

##### **1.05 PROJECT CONDITIONS**

- A. No satisfactory procedures are available to remove petroleum or rust stains from concrete. Prevention is therefore essential. Take precautions to prevent staining of concrete prior to application of hardener/sealer and for minimum of three months after application:
  - 1. Prohibit parking of vehicles on concrete slab.

2. If vehicles must be temporarily parked on slab, place drop cloths under vehicles during entire time parked.
  3. If construction equipment must be used for application, diaper all components that might drip oil, hydraulic fluid, or other liquids.
  4. Prohibit pipe cutting using pipe cutting machinery on concrete slab.
  5. Prohibit temporary placement and storage of steel members on concrete slab.
- B. Do not install products under environmental conditions outside manufacturer's absolute limits.
- C. Do not use frozen material; thaw and agitate prior to use.

#### **1.06 PRE-INSTALLATION MEETING**

- A. At least 20 days prior to the beginning of the installation work, the contractor shall hold a meeting to discuss application methods and procedures to meet the specifications. The contractor shall send a pre-installation agenda to all attendees prior to the scheduled date of the meeting. Attendees of every party concerned with the Concrete Hardener/Sealer work shall attend the meeting. Minutes of the meeting shall be recorded, typed and distributed by the contractor to all concerned parties.

#### **1.07 WARRANTY**

- A. Provide manufacturer's warranty that a structurally sound concrete surface prepared and treated according to the manufacturer's directions will remain permanently dustproof, hardened and water repellent. If after the specified sealing period the treated surface does not remain dustproof, hardened and water repellent, provide, at manufacturer's expense, sufficient material to reseal defective areas.

### **PART 2 - PRODUCTS**

#### **2.01 PRODUCTS**

- A. Hardener/Sealer: High performance, deeply penetrating concrete densifier; odorless, colorless, VOC-compliant, non-yellowing silicate based solution designed to harden, dustproof and protect concrete floors subjected to heavy vehicular traffic and to resist black rubber tire marks on concrete surfaces. The compound must contain a minimum solids content of 20% of which 50% is silicate.
- a. L&M Construction Chemicals, Inc., "Seal Hard", [www.lmcc.com](http://www.lmcc.com)
  - b. Curecrete Chemical Co. "Ashford Formula", [www.curecrete.com](http://www.curecrete.com)
  - c. Euclid Chemical Co. "Diamond Hard", [www.euclidchemical.com](http://www.euclidchemical.com)
  - d. approved equal

### **PART 3 - EXECUTION**

#### **3.01 INSPECTION**

- A. Inspect surfaces to which hardener/sealer is to be applied and report to General Contractor any conditions which will adversely affect application, appearance or performance of hardener sealer. Do not apply sealer until such conditions have been corrected. Application of hardener/sealer shall indicate acceptance of substrate and acceptance of responsibility for finished results.

#### **3.02 PREPARATION**

- A. Remove all residue, laitance and other contaminants. Test concrete surfaces for proper preparation. Place water drops on surface. If water beads rather than being absorbed, the surface is not prepared properly. Shot-blast as required.

#### **3.03 APPLICATION**

- A. Liquid Sealer Densifier shall be applied in strict accordance with the written directions of the manufacturer and the project specifications, including application rates.

- B. Liquid Sealer Densifier Finish: Apply this compound on exposed interior floors subjected to vehicular abrasion and shake on hardener slabs as indicated on the drawings. Application shall be made in strict accordance with the directions of the manufacturer and just prior to completion of construction. Spray, squeegee or roll on liquid densifier to clean, dry concrete surface. The liquid should be scrubbed into the surface with a mechanical scrubber. Keep the surface wet with the densifier during the application process. When the product thickens, but not more than 60 minutes after initial application, the surface shall then be squeegeed or vacuumed to remove all excess liquid.

#### **3.04 PROTECTION OF FINISHED WORK**

- A. Do not permit traffic over unprotected floor surface.
- B. Protect installed floors until chemical reaction process is complete, at least three months.
  - 1. Comply with precautions listed under PROJECT CONDITIONS.
  - 2. Clean floor regularly in accordance with manufacturer's recommendations because water will accelerate the sealing and scrubbing will impart a shine.
  - 3. Clean up spills immediately and spot-treat stains with good degreaser or oil emulsifier.
- C. Precautions and cleaning are the responsibility of the Contractor until Substantial Completion.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

## SECTION 03 41 00

### PRECAST PRESTRESSED CONCRETE

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

- A. Included:
  - 1. All labor, materials, equipment and services necessary to design, manufacture, transport, erect and complete precast structural concrete work including hollow core slab units, beams and columns.
  - 2. Include all concrete, strands, reinforcement setting beds, grouting, plates, inserts, clip angles and all other incidentals necessary for completion.
  - 3. Provide weld plates for miscellaneous architectural elements including stairs, railings, etc. as shown on plans.
  - 4. Fireproofing as required to maintain required fire rating.
- B. Work specified elsewhere:
  - 1. Cast-In-Place Concrete - Section 03 30 00
  - 2. Post-Installed Anchors - Section 05 05 19

##### **1.02 QUALITY ASSURANCE**

- A. The latest edition of the following specifications, standards and codes shall become part of this Specification as if written herein. Wherever requirements conflict, the more stringent shall govern.
  - 1. Concrete:
    - a. Formwork: Specifications cited in Section 03 10 00
    - b. Reinforcing: Specifications cited in Section 03 20 00
    - c. Concrete: Specifications cited in Section 03 30 00
  - 2. Pre-stressed Concrete Institute (PCI):
    - a. Mnl 116, "Manual for Quality Control for Plants and Production of Precast Pre-stressed Concrete Products"
    - b. Mnl 119, "PCI Architectural Concrete Drafting Handbook"
    - c. Mnl 120, "PCI Design Handbook - Precast and Pre-stressed Concrete"
    - d. Mnl 121, "PCI Manual for Structural Design of Architectural Precast Concrete"
    - e. Mnl 122, "PCI Architectural Precast Concrete"
    - f. Mnl 123, "PCI Manual on Design of Connections for Precast Pre-stressed Concrete"
    - g. Mnl 124, "PCI Design for Fire Resistance of Precast Pre-stressed Concrete"
    - h. Mnl 127, "Recommended Practice for Erection of Precast Concrete"
    - i. Mnl 135, "Tolerance Manual for Precast and Pre-stressed Concrete Construction"
    - j. TR4, "Criteria for Design of Bearing Pads"
  - 3. Steel: Specifications cited in Section 05100
  - 4. Welding: AWS Publications D1.0, D1.1, D1.4, D3.0, D5.1 and D12.1
  - 5. Industrial Fasteners Institute: Standard Fasteners
- B. Manufacturer:
  - 1. Manufacturer of precast concrete shall be a thoroughly experienced, financially responsible concern, regularly engaged in the manufacture of precast pre-stressed concrete units for a period of not less than five (5) years.
  - 2. The plant shall have capacity and equipment to produce units of size shown on drawings without delaying the Project.
  - 3. Manufacturer shall conform with "Manual for Quality Control for Plant and Production of Precast Pre-stressed Concrete Products" as published by Pre-stressed Concrete Institute, latest edition.
  - 4. Manufacturer shall be a participant in the Pre-stressed Concrete Institute (PCI) Plant Certification Program.

5. Approved Manufacturers:
    - a. Hollow Core Plank:
      - 1) County Prestress, LLC - Lockport, IL
      - 2) Mid-States Concrete Products - South Beloit, IL
      - 3) Wells Concrete Products - Wells, MN
      - 4) Approved equal
    - b. Beams, columns:
      - 1) County Prestress, LLC - Lockport, IL
      - 2) Mid-States Concrete Products - South Beloit, IL
      - 3) Wells Concrete Products - Wells, MN
      - 4) Approved equal
  6. Manufacturers not listed above who comply with requirements of specifications and drawings and manufacturers who propose to substitute other similar systems, may request approval by submitting written request to Architect not less than ten (10) days prior to bid opening. Approval will be based upon proposed design & construction materials, general finished appearance of product and experience records of comparable completed installations.
  7. Manufacturers requesting such approval shall submit, when requested, design calculations, applicable catalog sheets, descriptive literature and complete listing of deviations to specifications and detail drawings.
  8. Manufacturer will not be permitted to substantially alter appearance of structure, change any details or dimensions critically affecting other portions of Work or to substitute any material or method of construction, which will, in opinion of Architect, adversely affect appearance, maintenance or serviceability of structure.
- C. Erector qualifications: Regularly engaged for at least five years in the erection of precast concrete similar to the requirements of this project, with sufficient experienced personnel and equipment to maintain project schedule.
- D. Standards: Any reference in the specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. Contractor, in such cases, may choose to use any article, device, product, material, fixture, form or type of construction which, in judgment of Architect, expressed in writing, is equal to that specified.
- E. Tolerances: Conform to the more stringent requirements for fabrication and erection of the following:
  1. PCI MNL-116, Division V, Section 5
  2. PCI MNL-135
- F. Owner or Architect may reject precast members found to have cracking which may affect structural load-carrying capacity or long-term durability. Rejected pieces shall be replaced or repaired at Precast Contractor's expense. Repair procedures shall be stamped by Precaster's Professional Engineer certifying structural adequacy and submitted to Architect for review. Repair shall be skillfully done so as to be sound and permanent.
- G. All welders shall be certified in accordance with AWS.
- H. Testing: Precaster shall employ and pay for independent testing laboratory to perform tests. For PCI certified facilities, precast manufacturer may perform tests.
  1. Before production of units make, cure, and test one set of cylinders and cubes for each type of concrete required.
  2. Make cylinders and cubes of same design mix and materials as proposed for use in actual production of units. Test cubes for water absorption in accord with ASTM C97.
  3. During production of units, make, cure and test one set of cylinders for each 50 CY of concrete, but not less than one set for each day's pour.
  4. Make sets of 3 standard 6 x 12 inch cylinders.
  5. Cure cylinders in same manner as precast units they represent.
  6. Test cylinders in accord with ASTM C39. One at 7 days and 2 at 28 days.
  7. Test for air content each time cylinders are made, in accord with ASTM C231.



- I. If provisions of this specification conflict, the more stringent provision shall apply.

### **1.03 SUBMITTALS**

- A. Submit to Architect for review shop drawings bearing the seal of a Professional Engineer registered in the state in which the project is located showing setting plan, dimensions, reinforcing, details, location of anchors, openings and headers. Each slab or beam shall be identified by a standard mark to be listed on the schedule placed legibly on each unit at time of manufacture. Specify cambers anticipated at 28 days for all members. Provide location and details of anchorage devices that are to be embedded in other construction.
1. For precast plank, list the capacity provided in psf and required capacity as specified on the Construction Documents.
- B. Coordinate with trades requiring openings in order to secure all pertinent dimensions for the preparation of the manufacturer's shop drawings, design and fabrication. All respective trades, prior to submittal to Architect, shall mark up shop drawings with location and size of all cored openings through plank, to be accounted for in design.
- C. Precaster shall provide documents for Wisconsin Department of Safety and Professional Services (SPS) Plan Review SD-118 Component submittal form.
- D. Except for precast plank with standard uniform loads, provide calculations for precast units and connections for review, performed and stamped by a registered Professional Engineer, licensed in the state the project is located, to prove compliance with non-uniform load design requirements.
- E. Submit test reports for concrete strength, air entrainment, etc.

## **PART 2 - PRODUCTS**

### **2.01 DESIGN**

- A. All members are to be designed in accordance with applicable state and local codes and/or superimposed loads shown on plans, as well as any partitions and walls shown on Architectural plans and for any additional loads imposed by handling, transportation, erection or future expansion. Precaster to design and provide headers as required at openings, notches, etc. Give proper consideration to fire rating requirements and conditions of constraint. Precast Contractor to design all members and connections not designed by Engineer or changed from Engineer's design and shall be responsible for such. Conform to PCI Design Handbook, including crack width limitations.
1. At cored openings, as a minimum, assume at least one strand is cut. Coordinate all cored openings and locations with trades.
  2. Design any plank for a future cored opening, assuming at least one strand is cut.
  3. Floor members shall be designed for a 2000 lb. concentrated load (occupying an area 2'-6" square) at any location in lieu of a uniform live load.
- B. Precast Contractor is responsible for designing and supplying all strand, reinforcing and such additional connection hardware as may be necessary for fabrication, transportation and erection stresses.
- C. Precast Contractor is responsible for designing concrete mixture which will produce an architecturally acceptable finish and have physical characteristics necessary to achieve design requirements.
- D. Design deviations from plans will be permitted only after Architect's approval of manufacturer's proposed design, supported by complete design calculations and drawings. Design deviations shall provide an installation equivalent to basic intent without incurring additional cost to Owner. They shall be prepared by a registered Engineer experienced in pre-stressed concrete design.
- E. Consider temperature changes and solar heat gain including temperature differentials during the construction period. Provide connection releases.

- F. Camber:
  - 1. Concrete topping shall be considered as composite unless noted otherwise.
  - 2. Limit precast plank camber to 1 inch for 2 inch thick topping, 1-1/2" inches for 3 inch thick topping. Use standard weight plank as required instead of ultralight. Consider loss of specified topping thickness due to camber in design. Specified topping thickness applies to precast bearing ends, not at mid-span, and shall be finished to a level surface.

## 2.02 MATERIALS

- A. In order to minimize irregular appearance or difference in color of units, cement, aggregates and water for all exposed precast units shall be obtained from same source for entire unit of work.
- B. Aggregate: Conform to ASTM C33. Units exposed to exterior exposure shall be free from all staining, injurious, deleterious substances, chert free; for "Severe Weathering Region" and with less than 5% magnesium sulfate soundness loss.
- C. Concrete:
  - 1. Minimum Compressive Strength: 5000 psi, at 28 days, or strength as required to accomplish Architect's design intent.
  - 2. Maximum Slump: 2-1/2" (6.27 cm) prior to addition of plasticizers.
  - 3. Exposed environment: air entrainment 6%  $\pm$  1%.
- D. Admixtures: Shall conform to the requirements of Section 03 30 00. The use of calcium chloride or admixtures containing calcium chloride is not permitted.
- E. Reinforcing: Shall conform to the requirements of Section 03 20 00.
  - 1. All reinforcing steel required to be welded shall conform to ASTM A706 and AWS D-1.4. Galvanize final assemblies.
- F. Strand: ASTM A 416, stress relieved 250 and 270 ksi, uncoated 7 wire strands.
- G. Metal accessories required for spacing, assembling and supporting reinforcement: Units shall be non-corrosive or hot galvanized after fabrication and welding in external or corrosive environments.
- H. Steel: Use ASTM A36 where steel anchors, angles, plates, straps, etc. are shown or called for. They shall be shop primed and field touched up. All workmanship, fabrication and erection shall be in accordance with AISC Spec.
  - 1. All steel shall be galvanized, including column base plates and anchor bolts.
  - 2. Stainless steel may be substituted where galvanized steel is specified.
- I. All galvanizing shall be a minimum of 1.2 oz./sq. ft., except fasteners. All galvanized material shall be fully degreased before applying paint, insulation with pins and adhesive, sealants or similar finishes, or components sensitive to oil, grease and other contaminants. In lieu of the hot-dip process, the following is acceptable at Contractor's option:
  - 1. Flame spray-applied galvanizing
  - 2. Two-coat system for exterior or corrosive exposure as specified in Section 05 10 00.
- J. Areas of galvanized material to receive other than butyl sealants shall receive a coat of zinc-chromate primer to assure proper bond when the sealant is applied.
- K. Rust-Inhibitive Paint and Galvanized Steel Touch-up: "ZRC Galvinitite Cold Galvanizing Compound", ZRC Worldwide, Marshfield, MA.
- L. Bearing Pads: Conform to the requirements of the PCI Handbook, latest edition and to PCI Technical Report No. 4, "Criteria for the Design of Bearing Pads." Where requirements conflict, the more stringent provision shall apply.  
Protect against pad "walkout" and consider non parallel bearing surfaces, lift-off, rotation, etc.
  - 1. Elastomeric Pads: 50 to 70 Durometer, AASHTO grade (100% virgin) plain chloroprene (neoprene).
    - a. Neosorb, Voss Engineering Inc.

- b. Newlon, JVI Inc.
    - c. Approved equal
  - 2. Random Oriented Fiber (ROF) Material limited to 1200 psi bearing stress
    - a. Vossco, Voss Engineering Inc.
    - b. Mastecord, JVI Inc.
    - c. Approved equal
  - 3. Cotton-Duck fabric reinforced pads conforming to AASHTO 2:10:3 (L) and MIL-C-882C specifications
    - a. Sorbtex, Voss Engineering Inc.
    - b. Capralon, JVI Inc.
    - c. Approved equal
  - 4. Plank Bearing: Korolath or Hard Board Bearing Strips, or approved equal.
- M. Grout:
  - 1. For bearing, where a pad is not used, use non-shrink grout, minimum 5000 psi, 28-day strength, conforming to ASTM C1107.
  - 2. For keyways and butt joints, use minimum 3500 psi grout.
- N. Hangers, headers and miscellaneous loose plates, angles, etc. for precast connections shall be provided and installed by Precast Contractor.
- O. All putty, caulking, seals and sealants to be approved by Architect.
- P. All exposed aggregates to be approved by Architect.
- Q. Inserts (loop, coil, lifting, etc.):
  - 1. Dayton Superior
  - 2. Richmond
  - 3. Approved equal
- R. Provide dovetail anchor in precast beams or columns where in contact or abutting masonry construction.
- S. Flashing reglets: Polyvinyl chloride, 0.06 in (1.5mm) thick
  - 1. Type B-4, Superior Concrete Accessories
  - 2. Fry Reglet
  - 3. Burke
  - 4. Approved equal
- T. Sealant: Multi-component polyurethane sealant, non-staining, color to match precast or as selected and approved by Architect.
  - 1. Tremco "Dymeric 240" for vertical surfaces
  - 2. Tremco "THC 900/901" for horizontal surfaces, except as noted below.
  - 3. Pecora "Dynatrol II"
  - 4. Sika, "Sikaflex 2cNS"
  - 5. Approved equal
- U. Conduit: Conduit is not allowed to be placed in concrete toppings.

## 2.03 FABRICATION

- A. Forms:
  - 1. Steel forms shall be required for all cast standard sections.
  - 2. Wood forms may be used for special sections, but all exposed surfaces shall be troweled smooth to a finish acceptable to Architect.
  - 3. All protrusions shall be ground flush.
- B. Openings 12" (30 cm) or larger in plank shall be formed during manufacture. Where openings are larger than that which can be safely formed within unit, this Contractor shall cut and frame larger openings with concrete headers or structural steel hangers.
  - 1. All openings less than 12" (30 cm) not shown on structural drawings shall be drilled or

- cored in the field by trades involved. Openings less than 12" that are shown on structural drawings shall be installed by General or Lead Contractor. Size of holes shall be determined by size of pipe.
  - 2. Precast Contractor shall instruct Mechanical or other Contractors as to locations units may be drilled or cored.
  - 3. No tension rods or pre-stressed strands may be cut without approval of Precaster.
  - 4. If possible, locate holes through hollow section of precast plank.
  - 5. No drilling or coring will be permitted in precast beams or vertical stems of precast members.
- C. Anchorage:
  - 1. Provide and cast-in-place all shear plates, weld plates, inserts and other anchorages shown or required by good construction practices and manufacturer requirements.
  - 2. No hanger may be fastened into pre-stressed units without written approval of Precaster.
- D. Curing per industry standards and PCI MNL116.
- E. Finish: Formed surfaces shall be plant finished as indicated on the contract Drawings and defined as follows:
  - 1. Standard Finish (unexposed surfaces): produced in forms that impart a smooth finish to the concrete (i.e., plastic lined or metal). 3/8" (2.85 cm) surface holes caused by air bubbles, minor joint marks and minor chips and spalls will be tolerated, but no major or unsightly imperfections, honeycomb, or structural defects will be permitted.
  - 2. Architectural Finish (for surfaces exposed to view): No voids, honeycomb, or air holes larger than 1/4" (.635cm) in diameter will be accepted in the concrete. All air holes shall be filled with sand cement paste matching concrete in color and texture.
  - 3. Faces shall be clean and straight with no projecting fins, broken edges or defects. Warped or otherwise defective units will be rejected.
  - 4. All corners of precast concrete units where the two adjacent sides will be visible in the final construction shall be eased with a 3/4" chamfer.

### **PART 3 - EXECUTION**

#### **3.01 INSPECTION OF SURFACES**

- A. Before starting to erect precast concrete members, verify that structure and anchorage inserts not within the tolerances required to erect members have been corrected.
- B. Determine field conditions, elevations and dimensions by actual measurements.
- C. Start of installation constitutes acceptance of surfaces and conditions.

#### **3.02 TRANSPORTATION ERECTION AND INSTALLATION**

- A. No warped, cracked, broken spalled, stained or other defective units shall be set or erected.
- B. Transportation and erection, conforming to PCI Mnl 127, shall be performed by an organization thoroughly experienced in pre-stressed and precast erection. Deliver precast structural concrete units to Project site in such quantities and at such times to ensure continuity of installation.
- C. The General Contractor shall provide and maintain access and operating space for the equipment of the Precast Concrete Contractor. Such access may consist of, but need not be limited to, roads, ramps and crossings capable of supporting cranes and trucks normal to erection operations of this type, maneuvering under their own power. Foundation and utility excavations shall be back-filled where necessary and in accordance with the schedule of erection mutually agreed upon between this Contractor and the Precast Concrete Erection Contractor.
- D. Sequence of erection shall be thoroughly outlined prior to starting, and any special sequence outlined by Architect shall be strictly adhered to. Subcontractor must review installation procedures and coordination with other work, with General Contractor, other contractors and subcontractors

whose work will be affected by precast work. Where applicable, coordinate possible existing building interferences with new construction.

- E. Furnish anchorage items to be embedded in other construction without delaying the Work. Provide setting diagrams, templates, instructions, and directions, as required, for installation.
- F. Lift and support units only at lifting and support points as shown on Shop Drawings. Units shall be erected, aligned and leveled by methods recommended by manufacturer using equipment recommended or supplied by manufacturer. All members shall be handled by means of inserts placed reasonably close to final support points and shall not be handled so as to reverse stresses in members.
- G. Where required, secure by temporary bracing and ties to prevent displacement until permanent connections are made and members grouted.
- H. Installation shall be made directly on bearing surface prepared as called for and true to line and grade indicated on drawings. Where no topping is called for, provide latex leveling compound to provide smooth, level surface.
- I. Do all welding required at shear plates and other connections. All welding shall be by a certified welder in accordance with specification requirements. Touch up welds in galvanized assemblies with ZRC cold galvanizing paint per manufacturer instructions. It is critical that heat is controlled to prevent cracking of concrete. Concrete cracks shall be repaired.
- J. Grout all keyways and butt joints. Grout column connection blockouts. Grouting includes pointing, taping, and caulking of joints. Remove all seepage from underside of slabs before it hardens.
  - 1. Follow manufacturer's instructions for grouting operation. Joints shall be clean and moistened by pre-wetting.
- K. The maximum difference between the actual camber in any member which has been delivered to the job and the calculated camber for that member as specified on the shop drawings shall not exceed  $L/1200$ . If exceeded in the field, the deviation shall be reduced by field adjustment to the stated limit using a method approved by Engineer.
- L. Cooperate with other trades in permitting insertion of anchors, hangers, electric outlets, etc.
- M. Provide and install steel headers at openings as required.
- N. Fireproof exposed steel components as required to maintain required fire rating. Provide firesafing where required to maintain required fire rating. Consult with Architect. Provide member thickness and firesafing in joints between precast panels in compliance with IBC Section 721, "Calculated Fire Resistance" and Figure 721.2.1.3.1.
- O. Epoxy inject cracks that may affect structural load capacity. For parking structures, epoxy inject all cracks including torsion/warping cracks.
  - 1. Crack Repair by Epoxy Injection: Materials shall conform to ASTM C881 with appropriate viscosity based on crack width size, thickness of concrete section and injection access.
    - a. Submit proposed materials for review.
  - 2. Epoxy Crack Repair, Horizontal Surfaces: Two-component, super low viscosity epoxy resin for crack repair down to 2 mils (0.002") in width by gravity feed using broom or squeegee.
    - a. "Epoxeal GS Structural", BASF
    - b. "Dural 335", Euclid Chemical Corp.
    - c. "Sikadur 55SLV", Sika Corp.
    - d. Approved equal

### **3.03 CLEANING AND PROTECTION**

- A. When directed, give units final cleaning using soap and water solution. Use fiber brushes to remove any foreign matter and stains. Rinse with clear water.

- B. Employ adequate means to protect facing of units from staining, injury or other damage during handling, erection, and until work has been inspected and accepted. Respective trades shall provide protection after erection.
- C. Cover or protect precast plank from water intrusion.
  - 1. When water is entrapped in hollow cores and discovered during coring or hanging of equipment by trades, General Contractor shall drill weep holes in each hollow core at each end. Such additional work shall be subject to a change order.

#### **3.04 CONSTRUCTION LOADS**

- A. During the construction period, the Contractor shall provide means for the adequate distribution of concentrated loads so that the carrying capacity of any member is not exceeded.
  - 1. Review plans and consult with Precaster to determine allowable uniform live loads.
  - 2. Contractor shall hire a Professional Engineer to determine the adequacy of concentrated loads, e.g. construction equipment point or wheel loads.

END OF SECTION

## SECTION 05 05 19

### POST-INSTALLED ANCHORS IN CONCRETE AND MASONRY (CMU)

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

- A. Work Included:
  - 1. Furnish all work, labor, materials, equipment, training, supervision and inspections necessary to provide and install anchors in previously poured concrete and in masonry as indicated on Structural Drawings, as specified herein, or as otherwise required to anchor or support materials and equipment from structure.
  - 2. When required per this specification, Contractor shall hire, and include in the bid, the engineering services of a Professional Engineer and/or testing services of a fastener manufacturer or independent testing agency as indicated on Structural Drawings, as specified herein, or both.
- B. Related Sections:
  - 1. Division 03 Concrete Sections
  - 2. Division 04 Masonry Sections
  - 3. Division 05 Metals Sections
  - 4. Division 22 Hangers and Supports Section
  - 5. Division 23 Hangers and Supports Section
  - 6. Division 26 Hangers and Supports Section
- C. Work Not Included:
  - 1. Anchors, embeds, and other materials placed prior to concrete pour and cast into concrete - See Section 03 30 00
  - 2. Concrete reinforcing steel - See Section 03 20 00

##### **1.02 QUALITY ASSURANCE**

- A. Applicable Specifications: Latest edition of following specifications and recommended practices shall become part of this specification as if written herein. Wherever requirements conflict, the more stringent shall govern.
  - 1. ACI 318, Chapter 17
  - 2. Mechanical Anchors: ACI 355.2, "Qualification of Post-Installed Mechanical Anchors in Concrete"
  - 3. Adhesive Anchors: ACI 355.4, "Qualification of Post-Installed Adhesive Anchors in Concrete"
  - 4. Adhesive Anchors (Concrete): ICC-ES AC308
  - 5. Adhesive Anchors (Masonry): ICC-ES AC58
  - 6. Expansion and Screw Anchors (Concrete): ICC-ES AC193
  - 7. Expansion Anchors (Masonry): ICC-ES AC01
  - 8. Screw Anchors (Masonry): ICC-ES AC106
  - 9. Manufacturer's published specifications and installation requirements
  - 10. Applicable Building Code (e.g. International Building Code)
  - 11. ASCE/SEI 7, Chapter 13
- B. All post-installed anchors in concrete shall have current published ICC-ES or IAPMO-UES Evaluation Report indicating the anchor is approved for installation in cracked concrete.
  - 1. Anchors with embedment depth less than 1" are not allowed.
  - 2. For anchors with embedment depth between 1" and 1.5", anchors must be used in redundant anchorages in interior applications. The allowable tension value shall be reduced by 30% using concrete compressive strength of 2500 psi.
  - 3. All anchors shall be new. Reused anchors are not allowed.

- C. "Fast-set epoxy" is not allowed unless fasteners are tested and certified for use under sustained tension and overhead applications with suitable long-term creep performance per ICC-ES AC508 or AC308.
- D. Adhesive anchors or drop-in anchors are not allowed for use in overhead applications.
- E. Training, Inspections and Testing:
  - 1. Manufacturer/supplier shall provide the following to the job site:
    - a. Applicable copy of evaluation service report (ESR). Test and quality assurance protocols shall be followed.
    - b. Complete Manufacturer's Product Installation Instructions, (MPIIs) plus additional information if not included, separate from information on the cartridge, pertaining to:
      - 1) Storage
      - 2) Temperature of cartridge during installation
      - 3) Temperature of base material during installation
      - 4) Drilling method
      - 5) Drill bit size
      - 6) Depth of bore hole
      - 7) Condition of bore hole (dry, wet, water- filled)
      - 8) Cleaning procedure
      - 9) Gel time as a function of temperature
      - 10) Installation torque
      - 11) Minimum anchor embedments, proof loads and torques shall be provided to the Installer and Testing Agency.
  - 2. Manufacturer's representative shall provide training to all installers for each type of anchor to be installed. A written letter shall be provided to the Engineer of Record stating that this training occurred and that the installers are qualified to install these anchors. This letter shall include the names of the attendees, the date, and the name of the manufacturer's representative.
  - 3. Where adhesive anchors are used, the installers shall have completed training and passed the ACI/CRSI Adhesive Anchor Installer Certification program. Provide certificates for review. The Adhesive Anchor Installer shall be an individual who has demonstrated the ability to read, comprehend, and execute instructions to properly install adhesive anchors in concrete. The Adhesive Anchor Installer must also demonstrate possession of the knowledge to properly assess ambient conditions, concrete condition, materials, equipment, and tools for installing adhesive anchors and determine when it is appropriate to proceed with installation of adhesive anchor or when additional guidance from a Supervisor, Foreman, or project Engineer is required.
  - 4. Contractor shall hire a Testing and Inspection Agency for field quality control with experience in post-installed anchor inspections.
    - a. Proper anchor installations shall be certified in writing by the Testing Agency.
    - b. Testing Agency must perform periodic "special inspections" in accordance with IBC Chapter 17, the specific requirements in the manufacturer's product ICC-ES or IAPMO-UES Evaluation Report, and the manufacturer's printed installation instructions whichever are more restrictive.
    - c. Continuous special inspection is required for all cases where anchors are installed overhead (vertical up) and, in addition, for adhesive anchors installed horizontally and upward-inclined that will support sustained tension loads.
    - d. The special inspector must be on the jobsite initially during anchor installation to verify anchor type, anchor dimensions, concrete type, concrete compressive strength, hole dimensions, hole cleaning procedures, anchor spacing, edge distances, concrete thickness, proper adhesive installation, expiration date, proper anchor embedment, and tightening torque.
    - e. The special inspector must verify the initial installations of each type and size of anchor by construction personnel on the site. Subsequent installations of the same anchor type and size by the same construction personnel are permitted to be performed in the absence of the special inspector. Any change in the anchor product being installed or the personnel performing the installation requires an initial inspection. For ongoing installations over an extended period, the special inspector must make regular inspections to confirm correct handling and



- installation of the product.
- f. Each type of drilled-in anchor shall be proof load tested after installation by the Testing Agency in accordance with the following schedule. Adhesive and capsule anchors shall be torque tested.
    - 1) 10% of the total number of each type of anchor shall be load tested, 5 (five) anchors minimum.
    - 2) If any of the tested anchors fail the proof load or torque test, an additional 15% of the total number of the types of anchors that failed the previous test shall be load tested, at Contractor's expense.
    - 3) If any of the additional anchors fail the load test, all of the remaining anchors of the types of anchors that failed must be load tested, at Contractor's expense.
    - 4) All of the failed anchors shall be removed, replaced, and retested, at Contractor's expense.
    - 5) Tension testing should be performed in accordance with ASTM E488.
    - 6) Torque shall be applied with a calibrated torque wrench.
    - 7) Proof loads shall be applied with a calibrated hydraulic ram. Displacement of adhesive and capsule anchors at proof load shall not exceed  $D/10$ , where D is the nominal anchor diameter.
  - g. Subcontractor responsible for anchor installation shall provide all necessary and suitable equipment, hoists and lifts to allow proper inspection and testing.
- F. Where material or equipment must be supported from the structure, the installer of that material or equipment support shall be responsible for contracting the engineering design, supplying the anchors, and meeting the requirements of this specification unless specifically noted otherwise on the plans.
1. Such work includes, but is not limited to:
    - a. Pipe hanging (water and waste)
    - b. Sprinkler piping
    - c. Ceiling grids holding lighting or embedded fans
    - d. Air handling units
    - e. HVAC duct work
    - f. Lighting systems
    - g. Suspended Ceiling Grids
    - h. Electrical wire trays and conduit
    - i. Fire alarms, exit signs, and smoke detection devices
    - j. Temporary construction connections where life-safety is concerned
    - k. Curtain wall and glazing systems

### 1.03 SUBMITTALS

- A. ICC-ES or IAPMO-UES Evaluation Reports shall be submitted to the Architect/Engineer for all anchors that will be used on this project.
  1. Anchors specifically referenced by the structural plans or specifications shall have the Evaluation Reports submitted with a cover letter indicating the applicable details for each anchor.
  2. Anchors not specifically referenced by the structural plans or specifications shall have the Evaluation Reports submitted with the associated calculations.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  1. Structural design criteria
  2. Preparation instructions and recommendations
  3. Installation methods
  4. Storage and handling requirements and recommendations
- C. Preliminary proposals for substitutions to specified anchors must be submitted to the Architect/Engineer in a timely fashion so that the project is not delayed. This submittal shall include a copy of the contract document showing the specified anchor and a conceptual description of the proposed substitution. This proposal must also include the net cost or credit to the Owner.
  1. The Engineer or Architect may reject proposed substitutions for aesthetics, interference,

- inappropriate materials, fire ratings, or any other reason.
2. If the preliminary proposal for substitution is approved, the contractor must make a final substitution submittal in conformance with the "SUBSTITUTIONS" section included in this specification.
- D. When required, calculations shall be stamped by a Professional Engineer registered in the state in which the project is located. Calculations shall be reviewed for general conformance with the design intent and shall be submitted to the Engineer for record only. Calculations must be submitted to the State when required for a component submittal.
1. Stamped calculations are required to be submitted:
    - a. When a proprietary anchor is shown on the plans and a different anchor is substituted.
    - b. For anchors or anchor groups supporting more than 200 lbs. in a hung or horizontal direction, used by other trades and not shown on the structural drawings, installing Contractor shall provide the calculations.
  2. Calculations are not required to be submitted to the Architect/Engineer:
    - a. Where anchor size, length or embed length, spacing, and a proprietary trade name are specifically shown on the structural plans.
    - b. For anchors or anchor groups supporting less than 200 lbs. used by other trades and not shown on the structural plans, including hangers for piping, mechanical equipment, electrical raceways, etc. The equipment supplier remains responsible for the proper anchor design.
- E. Anchor training and installation qualification, and load test results as stated under "QUALITY ASSURANCE" shall be submitted to the Architect/Engineer for records by Manufacturer's Representative and Testing Agency.
1. Current Adhesive Anchor Installation Certificates shall be submitted to the Architect/Engineer prior to commencement of work.

#### **1.04 STORAGE AND HANDLING**

- A. Store anchors in accordance with manufacturer's recommendations. For adhesive anchors, consider temperature, exposure to sunlight, and shelf life.

#### **1.05 SUBSTITUTIONS**

- A. Anchors included in this specification, but not shown in a specific detail, may be considered a substitution anchor for that detail. The Contractor must submit a preliminary proposal for substitution as noted in the "SUBMITTALS" section of this specification. If the proposal is accepted, stamped calculations must be prepared and submitted as noted in the "SUBMITTALS" section of this specification. The structural capacity of the substitute anchor or anchor group must be no less than the capacity of the original anchors or the design load when shown on the plans.
- B. Other post-installed anchors will be considered in lieu of specified anchors provided they meet the requirements of both the "QUALITY ASSURANCE" section and the "SUBMITTALS" section of this specification. Submittals must be approved in writing by Engineer prior to installation.
- C. Cast-in anchorage in lieu of post-installed anchors will be considered provided that the anchors meet the requirements of the latest edition of ACI 318, Chapter 17 and calculations are prepared in conformance with the "SUBMITTALS" section of this specification.
- D. It is the Contractor's responsibility to obtain preliminary approval for substitutions from the Architect and Engineer in a timely fashion in conformance with the "SUBMITTALS" section of this specification.
- E. The Contractor proposing substitutions shall be responsible for all additional costs incurred related to that substitution, including those of other trades and design professionals. The Contractor proposing substitutions shall be responsible for coordination with all other trades.

## **PART 2 - PRODUCTS**

### **2.01 PRODUCTS AND MANUFACTURERS FOR USE IN CRACKED CONCRETE**

- A. Expansion Anchors and Wedge Anchors:
  - 1. "Power-Stud +SD1" (DeWalt Anchors)
  - 2. "Power-Stud +SD2" (DeWalt Anchors)
  - 3. "Kwik-Bolt 1 or Kwik-Bolt TZ2" (Hilti, Inc.)
  - 4. "HSL-3 Anchor" (Hilti, Inc.)
  - 5. "Strong-Bolt 2" (Simpson Strong-Tie)
  - 6. Approved equal
- B. Screw Anchors:
  - 1. "Kwik HUS-EZ" (Hilti, Inc.)
  - 2. "Screw-Bolt+" (DeWalt Anchors)
  - 3. "Titen HD" (Simpson Strong-Tie)
  - 4. Approved Equal
- C. Bolt and Shield Anchors:
  - 1. "Snake+" (DeWalt Anchors)
  - 2. Approved Equal
- D. Undercut Anchors:
  - 1. "HDA Undercut Anchor" (Hilti, Inc.)
  - 2. "Atomic+ Undercut Anchor" (DeWalt Anchors)
  - 3. Approved Equal
- E. Adhesive Products for Anchoring Bolts or Reinforcing Steel into Concrete:
  - 1. Must be prequalified for wet or damp applications and tested for creep performance.
  - 2. Only use Hilti-HY200 system, "Safe Set" system using HIT-Z rods or rebar.
    - a. No cleaning is required for HIT-Z anchors for temperatures above 41°F.
    - b. For temperature below 41°F for HIT-Z anchor installations, use Hilti TE-CD or TE-YD hollow drill bits with VC 20/40 Vacuum System.
    - c. For all temperatures for rebar installations, use Hilti TE-CD or TE-YD hollow drill bits with VC 20/40 Vacuum System.
  - 3. Other adhesive anchoring systems may be used only with Structural Engineer's written approval, and subject to inspection and verification that all required installation procedures (including multiple brush and blow cleanings) by the manufacturer are followed.
    - a. "PE1000+" Adhesive (DeWalt Anchors)
    - b. "Hit-RE 500 V3" Adhesive (Hilti, Inc.)
    - c. "Set-XP" or "AT-XP" Anchoring Adhesive (Simpson Strong-Tie)
    - d. "Red Head C6+" (ITW Red Head), excludes reinforcing steel
    - e. Approved Equal

### **2.02 PRODUCTS AND MANUFACTURERS FOR USE IN MASONRY**

- A. Expansion Anchors and Wedge Anchors:
  - 1. "Power-Stud +SD1" (DeWalt Anchors)
  - 2. "Kwik Bolt 3" (Hilti, Inc.)
  - 3. "HLC Sleeve Anchor" (Hilti, Inc.)
  - 4. "Strong-Bolt 2" (Simpson Strong-Tie)
  - 5. Approved Equal
- B. Screw Anchors:
  - 1. "Screw-Bolt+" (DeWalt Anchors)
  - 2. "Kwik HUS-EZ" (Hilti, Inc.)
  - 3. "Titen HD" (Simpson Strong-Tie)
  - 4. Approved Equal

- C. Bolt and Shield Anchors:
  - 1. "Hollow-Set Dropin" (DeWalt Anchors)
  - 2. Approved Equal
- D. Adhesive Anchors in Solid Grouted Masonry (CMU):
  - 1. Use only Hilti HIT-HY 270 Safe Set system with Hilti hollow drill bit and vacuum system per ICC ESR-4143.
  - 2. Steel anchor element shall be Hilti HAS-E continuously threaded rod or continuously deformed steel rebar.
  - 3. Other adhesive anchoring systems may be used only with Structural Engineer's written approval, and subject to inspections and verification that all required installation procedures (including multiple brush and blow cleanings) by the manufacturer are followed.
    - a. "AC100+Gold" Adhesive (DeWalt Anchors)
    - b. "Set-XP" High Strength Epoxy Adhesive (Simpson Strong-Tie)
    - c. "ET-HP" Epoxy Adhesive (Simpson Strong-Tie)
    - d. Approved Equal
- E. Adhesive Anchors Hollow/Multi-Wythe Masonry (CMU and Brick):
  - 1. Use only Hilti HIT-HY 270 Safe Set system with Hilti hollow drill bit and vacuum system per ICC ESR-4143.
  - 2. Steel anchor element shall be Hilti HAS-E continuously threaded rod or continuously deformed steel rebar.
  - 3. The appropriate size screen tube shall be used per adhesive manufacturer's recommendation.
  - 4. Other adhesive anchoring systems may be used only with Structural Engineer's written approval, and subject to inspection and verification that all required installation procedures (including multiple brush and blow cleanings) by the manufacturer are followed.
    - a. "AC100+Gold" Adhesive (DeWalt Anchors)
    - b. "Set-XP" High Strength Epoxy Adhesive (Simpson Strong-Tie)
    - c. "ET-HP" Epoxy Adhesive (Simpson Strong-Tie)
    - d. Approved Equal

## 2.03 MATERIALS

- A. Interior Use (unless noted otherwise): Provide carbon steel anchors with zinc plating in accordance with ASTM B633, Type III (SCI), for use in conditioned environments free from potential moisture.
- B. Exposed Use: Provide Type 316 stainless steel anchors with Series 316 or Type 18-8 stainless steel nuts and washers unless noted otherwise for the following conditions:
  - 1. Exterior environments.
  - 2. Potentially moist environments including exterior wall construction.
  - 3. Corrosive environments including pools and pool equipment rooms, and attachments within utility tunnels.
  - 4. All exterior wall cladding support and anchorage.
  - 5. Where anchor is in contact with preservative treated wood for exterior and interior environments.
  - 6. Any other location or detail that is noted on the plans.
  - 7. Avoid installing stainless steel anchors in contact with galvanically dissimilar materials.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Identify location, by GPR, X-ray or other nondestructive means, of embedded items such as reinforcing steel, stressing tendons, conduit, heating tubes, etc. prior to drilling holes. Coordinate with respective trades if any apparent conflict exists. Exercise care in coring and drilling to avoid damaging any existing embedded items. Do not cut reinforcing steel or other embedded items if

embedded items are encountered, stop drilling and contact Engineer immediately. Any offsets or relocations of anchors must be approved by Engineer. This Contractor is responsible for the cost of any required repairs including engineering costs.

- B. Anchor capacity is dependent upon spacing between adjacent anchors and proximity of anchors to edge of concrete. Install anchors in accordance with spacing and edge clearances indicated on the drawings.
- C. Drill holes of proper diameter and depth in accordance with manufacturer's published design information for that specific anchor. Use only equipment approved by anchor manufacturer. All holes shall be perpendicular to the concrete surface unless shown otherwise on structural plans.
- D. Do not drill holes until base material has achieved full design strength.
- E. Install in strict accordance with Manufacturer's Published Installation Instructions and recommendations. Use hammer drills for adhesive anchors.
- F. Clean out holes, properly prepare substrate, and install anchors in accordance with manufacturer's instructions. Proper tools must be on job site.
- G. Torque-Controlled Anchors: For all torque-controlled anchors including: wedge anchors, heavy-duty sleeve anchors, and undercut anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in part to be fastened. Set anchors to manufacturer's recommended torque, using a properly calibrated torque wrench. Following attainment of 10% of the specified torque, 100% of the specified torque shall be reached within 7 or fewer complete turns of the nut. If the specified torque is not achieved within the required number of turns, the anchor shall be removed and replaced.
- H. For adhesive anchors, maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer. Verify that base material temperature is within manufacturer limits. Do not install adhesive anchors if any criteria do not fall within manufacturer's limits. Ensure that bore holes and anchors are free of dust, water, ice, debris, grease, oil, dirt and other foreign matter. Remove water from drilled holes in such a manner as to achieve a surface dry condition.
  - 1. All adhesive anchor installations shall be performed by a certified ACI/CRSI Installer.
  - 2. Adhesive anchors shall be installed in concrete having a minimum age of 21 days at time of anchor installation.
  - 3. Use hammer or rotary-impact drills, not diamond drills, as required by the manufacturer.
  - 4. Dispose of initial mixture of hardener and resin pushed through the mixing nozzle. Mixture shall have a uniform color when installed.
  - 5. Do not reuse the mixing nozzle from a previous cartridge, or modify mixing nozzles.
  - 6. Adhesive shall be injected from the bottom of the hole and the nozzle withdrawn as filling progresses. Spare adhesive must be visible all around the mouth of the hole. When applicable, only piston plug installation methods may be used. End-cap methods are not allowed.
  - 7. Shim anchors with suitable device to center the anchor in the hole. Anchors shall be set perpendicular to the concrete surface. Do not disturb or load anchors before manufacturer specified cure time has elapsed.
  - 8. Anchor rods shall not be straightened after installation and threads shall not be fouled with adhesive.
- I. For adhesive anchors, protect anchors with approved fire resistive materials, or spray-on fireproofing when anchors are attached to fire rated construction. Refer to ICC-ES or IAPMO-UES Evaluation Service Reports (ESR's) Conditions for Applicability.

### **3.02 REPAIR OF DEFECTIVE WORK**

- A. Remove and replace defective work, including misplaced, malfunctioning and non-conforming anchors. Fill empty anchor holes with high-strength non-shrink grout. Anchors that fail to meet installation torque requirements or proof loads shall be considered non-conforming.

- B. The Architect/Engineer reserves the right to require additional pullout or shear tests to determine the adequacy of anchors at no extra cost to the Owner.

END OF SECTION

## SECTION 05 10 00

### STRUCTURAL STEEL

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

- A. Work Included:
1. Furnish all work, labor, materials, equipment and supervision necessary to complete all structural steel work as indicated on Structural Drawings, as specified herein or both.
  2. Provide anchor bolts for column bases and base plates, column bases, bearing plates, columns, beams, girts, rods, hangers, plates stiffeners, connections, clips, struts, bracing, separators, fittings, field bolts, etc. as required.
  3. Provide deck supports not shown or specified under other Sections, but necessary for the proper support of deck and applied loads.
  4. Provide pour stops around the building perimeter and at all openings, end closures, closure plates around all columns and work of other trades and any other accessories required.
  5. Provide erection of all structural steel, except loose lintels not requiring services of skilled iron workers or special equipment.
  6. Provide templates for the installation of anchor bolts.
  7. Provide shop-applied primers and paints.
  8. All other work shown in the Drawings, specified in this Section or required to make the work complete.
- B. Related Work Specified Elsewhere:
1. Concrete Reinforcing Steel - Section 03 20 00
  2. Post-Installed Anchors - Section 05 05 19
  3. Miscellaneous Steel Work - Section 05 50 00

##### **1.02 QUALITY ASSURANCE**

- A. Reference Standards: The following latest edition reference specifications, including appendices and supplements, shall become a part of this specification as if written herein. If provisions of reference standards and this Section conflict, the more stringent provisions shall govern.
1. AISC 303 "Code of Standard Practice for Steel Buildings and Bridges"
    - a. Exposed Structural Steel: All exposed structural steel is classified as Architecturally Exposed Structural Steel (AESS) as defined by AISC. Comply with AESS quality requirements for all exposed structural steel.
  2. AISC 360, "Specification for Structural Steel Buildings," including the "Commentary" and Supplements thereto as issued.
  3. AISC Manual, "Detailing for Steel Construction"
  4. ASTM 780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
  5. ASTM materials cited in this specification.
  6. American Welding Society (AWS) D1.1 "Structural Welding Code"
  7. AWS "Standard Qualification Procedure"
  8. Research Council on Structural Connections (RCSC) "Specification for Structural Joints Using High-Strength Bolts"
  9. OSHA Standard "Safety and Health Regulations for Construction", Part 1926
  10. Society of Protective Coatings (Formerly Steel Structures Painting Council) "Steel Structures Painting Manual", Volumes 1 and 2 and applicable SSPC Standards
- B. All work shall be in accordance with applicable manufacturer's and supplier's instructions.
- C. Conform to applicable OSHA 1926 requirements including detailing and erection requirements. Provide stabilizer plates as required.

- D. Fabricator Qualifications: Engage a firm with a minimum of 10 years' experience in fabricating structural steel similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to fabricate structural steel without delaying the Work.
- E. Steel Detailer Qualifications: Minimum of five (5) years' experience preparing and detailing steel shop drawings on projects of comparable size and complexity.
- F. Erector Qualifications: Engage a firm with a minimum of ten years' experience in erecting structural steel for projects of similar type and scope and with a record of successful completion, and shall provide sufficient experienced personnel and equipment to maintain project schedule.
- G. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure" and AWS D.1.
  - 1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests for the types of welds to be performed. If re-certification of welders is required, re-testing will be Contractor's responsibility.
- H. High performance coatings for steel, including paints for exterior or corrosive exposures, and architectural, exposed exterior steel:
  - 1. Reference Division 09 of the specification. Where conflicts exist with this specification, the more stringent and costly requirements shall govern unless approved in writing by Structural Engineer. Notify Architect and Engineer.
  - 2. Manufacturer's Qualifications:
    - a. Specialize in manufacture of coatings with a minimum of 10 years successful experience.
    - b. Able to demonstrate successful performance on comparable projects.
    - c. Single Source Responsibility: Coatings and coating application accessories shall be products of a single manufacturer.
  - 3. Applicator's Qualifications:
    - a. Experienced in application of specified coatings for a minimum of 5 years on projects of similar size and complexity to this Work.
    - b. Applicator's Personnel: Employ persons trained for application of specified coatings.
  - 4. Base bid under this specification section shall include galvanizing and the first coat primers for two-coat systems or less, first and second coat for three-coat systems, as specified in this section.
    - a. Where multiple coat systems are required, it is preferred to have the additional coats to be shop-applied with field touch-up.
    - b. The cost for shop-applied application of the top coat in multiple-coat systems shall be stated separately in the bid form.
- I. Quality control, including non-destructive testing, shall be performed by Fabricator and Erector and shall conform to the requirements of Chapter N of AISC 360.
- J. Inspection of Welds:
  - 1. Contractor shall select and pay for the services of an independent Testing Laboratory to inspect welded connections, perform tests and prepare test reports.
  - 2. Testing shall conform to American Welding Society AWS D1 B1.10, D10.9, and QC1 - Latest Editions. The inspector shall be an AWS Certified Welding Inspector, with minimum of three years' experience. Conform to ASTM E94, E142, E164, E165, E709, and E1032 as applicable.
  - 3. The Testing Laboratory shall conduct and interpret the tests and state in each report whether the test specimens comply with AWS requirements and specifically state any deviations therefrom. Record types and locations of defects found in work. Record work required and performed to correct deficiencies. Submit six (6) copies of welding inspection reports and tests to the architect.
  - 4. Inspector shall verify welders are AWS certified for the type of weld being performed.
  - 5. Testing Agency shall have access to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.



6. Testing Agency may inspect structural steel at plant before shipment; however, Structural Engineer reserves right, at any time before final acceptance, to reject material not complying with specified requirements.
7. Inspect and test structural steel assemblies as follows:
  - a. Perform visual inspection of all completed welds. Provide visual inspection prior to and during welding as determined by Inspector.
  - b. All partial and full penetration welds, plug and slot welds: 100% Ultrasonic Testing (ASTM E164), or Radiographic Testing, as preferred by weld Inspector.
  - c. For all hanger type tension connections, multiple pass fillet welds, single pass fillet welds greater than 5/16", and fillet welded moment connections: 50% Magnetic Particle Testing or Alternating Current Field Measurement (ACFM), as preferred by weld Inspector.
  - d. Connections of new construction to existing members: 100% Magnetic Particle Testing, or ACFM.
  - e. Remainder of Weld: 10% Magnetic Particle Testing or ACFM.
  - f. Magnetic Particle Testing may only be performed on uncoated steel with no paint or primers.
  - g. Other non-destructive weld testing procedures may be used subject to weld inspector's written recommendations.
  - h. Rejected Welds: If more than 10 percent of any weld type is rejected, test an additional 20 percent of remaining welds in same manner. If more than 10 percent of additional welds are rejected, test an additional 20 percent of remaining welds. If more than 10 percent of these welds are rejected, then retest all welds. Additional testing shall be paid by the welding sub-contractor.
8. Weld inspection shall conform to AWS D.1 Chapter 6 and Chapter 8.
9. Test Results: Test result information shall be forwarded electronically to the Engineer immediately after test results are available, stating the acceptance or rejection of fabricated components, so that repairs and re-inspection or testing may be performed as soon as possible.
10. Subcontractor's Responsibilities:
  - a. Furnish labor required to facilitate testing.
  - b. Inform Testing Laboratory and Structural Engineer with at least one day's notice when welding work is to be performed.
  - c. Provide access to fabricator's shop for testing.
  - d. Provide any hoisting or handling necessary to accomplish testing work.
  - e. Subcontractor is responsible for the expense of testing or inspection resulting as a consequence of the following:
    - 1) Testing to verify the adequacy of work done without prior notice, improper supervision, or contrary to Contract Documents or standard construction practice.
  - f. Unacceptable welds shall be repaired in accordance with AWS D1.1, Section 5.26. Repaired or corrected welds shall be re-inspected and retested as specified for the original weld.

### 1.03 SUBMITTALS

- A. Shop Drawings:
  1. Shop Drawings shall be prepared immediately on set award of this Contract. No steel shall be ordered until erection diagrams have been approved.
  2. Drawings shall indicate necessary information for fabrication, erection and painting per AISC Specifications and per this specification.
  3. Include details of cuts, connections, camber, holes, stiffeners and other pertinent data. Indicate welds by standard AWS symbols, and show size, length, and type of each weld. Indicate special painting or galvanizing requirements on piece drawings.
    - a. Shop drawings shall clearly indicate by welding symbols or sketches the details of groove welded joints and the preparation of base metal required to make them.
  4. Individual beam piece drawings shall show the distance from beam ends to column and wall centerlines. Individual column piece drawings shall indicate related top of beam elevations, top of pier/footing elevations and beam depth.

5. Provide setting drawings and directions for the installation of anchor rods, bearing plates, holes, and other anchorages to be installed by others. Indicate top of bearing plate elevations. Provide exact dimensions and elevations to locate embed plates in concrete.
6. Duplicate all applicable details and sections from Structural Drawings and key into plans for submittal. Failure to do so is cause for rejection of Drawings.
7. The Fabricator alone shall be responsible for all errors of detailing, fabrication, and for the correct fitting of the structural members. All fabricated material and connections shall fit within architectural constraints.
8. Take measurements in field as required to verify or supplement dimensions shown on Drawings for new and existing construction. Note verified dimensions on shop drawings. Field verify existing anchor bolt placements and modify base plates to accommodate field conditions.
9. Provide a schedule of shop drawing submittals for the Architect's information at least 30 days prior to the first shop drawing submittal. Shop drawings must be submitted in conformance with the agreed-upon submittal schedule.
10. Structural steel shop drawings shall be complete on first submittal unless specifically agreed in writing by Engineer prior to submittal.
11. Resubmittals of shop drawings: When a shop drawing is resubmitted with new or revised information, these items shall be "clouded". All redmarks from a previous submittal shall be incorporated.
12. Structural steel members for which Shop Drawings have not been reviewed and approved shall not be fabricated.
13. The omission from the Shop Drawings of any materials required by the Contract Documents shall not relieve Contractor of the responsibility of furnishing and installing such materials, even though the Shop Drawings may have been reviewed and approved.

**B. Primers and Paint:**

1. **Product Data:** Except for basic interior primers, submit manufacturer's product data for each coating, including generic description, complete technical data, surface preparation, and application instructions. Include written verification from the manufacturer that the primer is compatible with finish coats.
2. **Color Samples:** Submit manufacturer's color samples showing full range of standard colors for architectural exposed applications.
3. **Manufacturer's Quality Assurance:** Submit manufacturer's certification that coatings comply with specified requirements and are suitable for intended application.
4. **Applicator's Quality Assurance:** For exterior/ corrosive environments and for architectural exposed applications, submit list of a minimum of 5 completed projects of similar size and complexity to this Work. Include for each project:
  - a. Project name and location
  - b. Name of owner
  - c. Name of contractor
  - d. Name of coating manufacturer
  - e. Approximate area of coatings applied
  - f. Date of completion
5. **Warranty:** Submit manufacturer's standard warranty, except:
  - a. For high performance coating systems for Architectural Exposed Exterior Steel, provide 15 year warranty for color and gloss retention. Where this requirement conflicts with Architectural sections, provide the higher cost installation.

**C. Inspection Reports:** Submit reports for the inspections specified. Fabricator and Erector shall provide submittals in conformance with Chapter N of AISC 360 for quality control and non-destructive testing.

**D. Connection Design and Detailing:** Conform to AISC Code of Standard Practice, Section 3, except as noted below.

1. All framed connections, including bracing, shall be designed by a licensed Professional Engineer, hired by the Fabricator, with such cost included in the Fabricator's bid.

2. Calculations, and the cover letter transmitting the shop and erection drawings, shall be submitted for record only and shall be stamped by the Connection Design Engineer registered in the state in which the project is located. Engineer's seal may be qualified "For Design of Connections Only". Review by the Engineer of Record (EOR) of submittals is only for review of general conformance with the design concept, including verification of the connection design loads shown on the shop drawings. In no case shall this review relieve the contractor of the responsibility for design, adequacy and safety of all connections, correctness of fit, general or detailed dimensions, quality or quantity of materials, or any other conditions, functions, performance or guarantees required.
  - a. Cover letter shall indicate that the shop drawings conform to the connection design intent and have been reviewed and coordinated.
3. Representative samples of calculations and substantiating information shall be submitted prior to preparation of final shop and erection drawings.
4. Calculations shall be submitted with the first shop drawing submittal, and shall be cross-referenced with all shop drawing submittals, including piece marks.
5. Use details consistent with the details shown on the Drawings, supplementing where necessary. The details shown on the Drawings are conceptual and do not indicate the required weld sizes or number of bolts unless specifically noted. Use rational engineering design and standard practice in detailing, accounting for all loads and eccentricities in both the connection and the members. Promptly notify the Engineer of Record of any location where the connection design criteria is not clearly indicated.
6. Shop drawings will not be reviewed without the submittal of coordinated connection calculations.
7. Shop drawings shall indicate design reactions and reference connection standard or special calculations.
8. Connection Criteria and Restrictions, unless specified otherwise on the structural drawings:
  - a. Unless noted otherwise, loads provided by Engineer of Record (EOR) are unfactored working stress loads. The method of design shall be ASD.
  - b. The reactions, as provided by the EOR, shall be multiplied by 1.15 for connection design.
  - c. Beam to column connections shall be double angle connections.
  - d. Where purlins and beams support uniform loads only, connections to interior girders may be single angle connections. Provide double angle connections when purlins and beams support non-uniform and/or concentrated loads.
  - e. Where purlins and beams frame into girders or spandrels from one side only (e.g. perimeter beams), provide double angle connections, or provide a single full-depth stiffener each side of girder.
  - f. For beam to column and beam to girder connections, provide the maximum number of 3/4" diameter Grade A325 bolts in a single line for a given beam depth.
  - g. Connection Design Engineer is responsible for designing connections, including stiffeners and/or doubler plates. Column size may be increased, if within dimensional constraints, to replace stiffeners or doubler plates subject to written approval by EOR, and subject to erector or crane limitations.
  - h. All members with moment connections, as noted on drawings, shall be welded to develop full flexural capacity of member, unless noted otherwise on drawings.
  - i. Connections for all struts, hangers and braces shall have connection designed to develop full allowable tensile strength of member unless design force is indicated on drawings.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. Structural Steel Material Properties
  1. W and WT shapes: ASTM A992
  2. S and M shapes: ASTM A36,  $F_y=36$  ksi or ASTM A529, A572, or A992, Gr. 50
  3. HP shapes: ASTM A572, Gr. 50 or ASTM A588, Gr. 50 when specified on drawings
  4. Channels: ASTM A36 or ASTM A529, A572, or A992, Gr. 50

5. Angles: ASTM A36 or ASTM A529, A572, or A992, Gr. 50
6. Plates and Bars: ASTM A36, Fy=36 ksi or ASTM A572, Gr. 50
7. Rectangular or Square (HSS) Hollow Structural Sections: ASTM A500, Gr. C, Fy = 50 ksi, or A1085 Gr. A, Fy=50ksi.
8. Round (HSS) Hollow Structural Sections: ASTM A500, Gr. C, Fy = 46 ksi, or A1085 Gr. A, Fy=50 ksi.
9. Steel Pipe: ASTM A53, Gr. B, Fy = 35 ksi.
10. Specify material type and grade on Shop Drawings.
11. All steel shall be mill certified

B. Fasteners:

1. Anchor bolts shall be ASTM F1554, Grade 36, or weldable Grade 55 Supplement 1, unless noted otherwise, with ASTM A563 heavy hex nuts. Provide washers per AISC Manual Table 14-2.
  - a. Provide special elongated nuts when anchor bolts are cast with insufficient projection for column base plates. Develop tension capacity of anchor.
    - 1) "Elocone Nuts", Canam
2. All other bolts for connection of structural steel shall follow ASTM F3125 Grade A 325, 3/4" minimum diameter, with ASTM A563 heavy hex nuts and hardened washers. Bolted connections are "snug-tight" type unless noted. Threads may be included in shear plane. All bolts shall be new and not reused, with head markings and fully traceable.
  - a. Provide slip-critical bolted connections for bracing, moment connections, cantilevers, tension members, bolts installed in over-sized holes (except anchor bolts), bolts in slotted holes where the force is parallel to the long direction of the slot, in connections subject to fatigue, and in connections in which a combination of bolts and welds resist applied loads (weld only after bolts are tightened) except where bolts are used for erection only.
3. Headed welded studs shall be manufactured by Nelson Stud Welding Company or approved equal and shall conform to ASTM 29 and ASTM A108, Grade 1015 or 1020, with dimensions complying with AISC specifications. Welding equipment used for installation shall conform to the requirements of AWS D1.1.
4. Deformed Bar Anchors (DBA's): Weldable anchors shall provide full tension and shear capacity when embedded in concrete conforming to ASTM A496, Type C, 80,000 psi tensile strength, 70,000 psi yield strength.
  - a. Nelson D2L deformed bar anchor
  - b. Stud Welding Assoc. Inc.
  - c. Tru-weld Stud Welding, TFP Corp.
  - d. Approved equal
5. Washers:
  - a. All washers shall be circular, flat and smooth and shall conform to the requirements of Type A washers in ANSI Standard B23.1. Washers for high strength bolts shall be hardened and conform to ASTM F436 Specification for Hardened Steel Washers.
  - b. Beveled washers for American Standard Beams and channels shall be square or rectangular, shall taper in thickness (16 2/3% slope) with an average thickness of 5/16". When an outer face of a bolted part has a slope greater than 1:20 with respect to a plane normal to the bolt axis, a beveled washer shall be used.
  - c. For fixed base and tension connections, washers for all base plates shall be minimum 5/16" thick plates extending minimum 1" from edge of base plate holes on each side with holes 1/16 inch larger than the nominal bolt diameter. Washers shall conform to ASTM A36 steel.
  - d. Load Indicator Washers, conforming to ASTM F959
    - 1) "Coronet Load Indicators", Cooper and Turner
    - 2) "Bethlehem Load Indicator Washers", Bethlehem Steel Corp.
    - 3) Approved equal
6. Twist-off type bolts, conforming to ASTM F3125 Grades F1852 or F2280:
  - a. "LeJeune Tension Control Bolts", LeJeune Bolt Co.
  - b. "VFM Tension Control Bolts", Vermont Fasteners Manufacturing
  - c. Approved equal

7. Galvanized Bolts: Provide bolts, nuts and washers that are hot dip galvanized according to ASTM A153, Class C when used to connect steel called for on the drawings or in the specifications as hot dip galvanized after fabrication, and for material painted for exterior or corrosive environments.
  8. Oversize, Short Slotted and Long Slotted Holes: The dimensions and washer requirements of oversize, short slotted, and long slotted holes shall conform to the AISC high strength bolting specification.
- C. Electrodes for Arc Welding: Comply with AWS Code E70XX.
- D. Masonry Anchors:
1. Where secured to flanges of member, weld-on anchor rods consisting of 9" overall length, 1/4" bright finished wire with 3/8" offsets to provide 4" adjustment of masonry anchors. Adjustable portion by Mason.
  2. Where secured to webs of members, weld-on anchors consisting of 8 gauge hot dipped galvanized angle, 7" high x 1/2 flange depth with 1" return for fastening. Provide 5" high slotted hole 3/4" from outer edge to receive wire tie by Mason.
- E. Paint:
1. Materials for multi-coat paint systems shall be supplied by the same manufacturer and be compatible, including water-based finish coats. Finish color as approved by Architect. Paint shall be delivered to shop and job in original sealed containers, marked with manufacturer's brand identification. Use thinning or admixtures as per manufacturer's recommendations only.
    - a. Reference section 09 97 00 Corrosion Resistant Coatings for all prime, intermediate, finish coating coinciding with shop work.
    - b. Manufacturer's recommended dry film thickness (DFT) shall supersede the requirements specified below when they are greater than specified minimums.
  2. Interior Exposure, Structural Steel not exposed to view, non-corrosive environment.
    - a. Paint as specified below for interior, exposed to view applications, unless spray-on fireproofing will be applied.
  3. Interior Exposure with no additional finish coat, or with Alkyd or acrylic finish coats, as specified by the Architect, and/or exposed to view, unless spray-on fireproofing will be applied.
    - a. Shop Prime Coat: Modified Alkyd Rust Inhibitive Primer with dry film thickness minimum 2.0 mils.
      - 1) Carboline 893-0500 grey
      - 2) Carboline GP-818 red
      - 3) Devoe Rustguard 4140
      - 4) PPG 7-800 or 6-200 Series
      - 5) Sherwin Williams A101, E61RC21 and E61AC82
      - 6) Tnemec Company, Series 10
      - 7) Approved equal
    - b. Where Intumescent Paint is specified for fireproofing, provide a primer that is compatible and approved by paint manufacturer (e.g. "CAFCO Spray Film" by Isolatek International).
      - 1) Tnemec Series 115 Unibond for WB 2, 3, 4
      - 2) Approved equal
  4. Interior Exposure with epoxy, urethane or solvent-based finish coat as specified by the Architect:
    - a. Shop Prime Coat with 3.0 to 5.0 mils dry film thickness.
      - 1) Devoe: Devran 220 Heavy Duty Epoxy Coating.
      - 2) PPG: Amercoat 370.
      - 3) Sherwin Williams: Macropoxy 646.
      - 4) Tnemec: Series 66, Hi-Build Epoxoline, or 161 Polyamide Epoxy.
      - 5) Approved equal
  5. Exterior and Corrosive Exposures below grade:
    - a. Coal-Tar Epoxy Paint: 100% solids, high performance modified coal tar to be site applied below grade to all steel in exterior, (e.g., canopy) and corrosive interior (pool) applications.
      - 1) "PA 8003-K", Blue Water Marine

- 2) "Bitumastic 300M", Carboline
  - 3) "C9578", Rust-Oleum
  - 4) "Simtar-200", Simco Coatings
  - 5) "Series 46H-413", Tnemec
  - 6) Approved equal
6. Exterior or Corrosive Exposure:
- a. Two-coat system shall be used for all non-architectural, exposed or non-exposed-to-view steel components, unless noted otherwise, including:
    - 1) Shelf angles and exterior wall lintels including bottom plates.
    - 2) Parapet wall supporting members.
    - 3) Screen wall supporting members.
    - 4) Support steel for exterior mechanical units.
    - 5) Building skin support steel exposed to moisture outside the interior vapor barrier or exterior water proofing surface.
    - 6) Isolated, exterior columns and bases, e.g. canopy support columns, baseplates and anchor bolts, with or without cladding covers.
    - 7) Bolted and welded connections for above referenced framing. Bolts, nuts, and washers shall be galvanized as primer coat.
  - b. Hot dip galvanizing or shop applied cold-spray galvanizing using specified preparation procedures are acceptable alternates to the two-coat system specified below.
  - c. First Coat: Zinc-rich, shop-applied primer with 2.5 to 3.5 mils dry film thickness.
    - 1) Devoe: 302H Catha-Coat Reinforced Inorganic Zinc Primer
    - 2) PPG: Moisture Cure Urethane Zinc-Rich Primer, UC95147/97-674 or Amercoat 370
    - 3) Sherwin Williams: Corothane I Galvapak Zinc Primer
    - 4) Tnemec: 90-97 Theme-Zinc, Zinc-Rich Urethane
    - 5) Approved equal
  - d. Second Coat: Shop or field-applied, with 2.5 to 3.5 mils dry film thickness:
    - 1) Devoe: 378 Devthane Aliphatic Urethane
    - 2) PPG: Pitthane High Build Urethane, 95-8400 Series
    - 3) Sherwin Williams: Acrolon Ultra
    - 4) Tnemec: Series 73. Endura-Shield; Series 1074 or 1075
    - 5) Approved equal
7. Exterior or Corrosive Exposure:
- a. Three-coat system shall be used for all architectural, exposed-to-view steel components, unless noted otherwise on plans, including:
    - 1) Exposed exterior framing including columns, beams, miscellaneous angles, canopies, etc.
    - 2) All steel in corrosive interior environments including beams, columns, angles, etc.
    - 3) Bolted and welded connections for above referenced framing. Bolts, nuts, and washers shall be galvanized as primer coat.
    - 4) Hot-dip galvanizing, using specified preparation, is an acceptable alternative to the first coat, (and second coat if second coat is not required for adhesion of finish coat). Second and third coats shall be provided after proper surface preparation, including SP7 sweep blast.
  - b. First Coat: Zinc-rich, shop-applied primer with 2.5 to 3.5 mils dry film thickness.
    - 1) Devoe: 302H Catha-Coat Reinforced Inorganic Zinc Primer
    - 2) PPG: Moisture Cure Urethane Zinc-Rich Primer, UC95147/97-674 or Aquapon Zinc Rich Epoxy Primer 97-670
    - 3) Sherwin Williams: Corothane I Galvapak Zinc Primer
    - 4) Tnemec: 90-97 Theme-Zinc, Zinc-Rich Urethane, Series 66 or 161
    - 5) Approved equal
  - c. Intermediate Coat - Shop-applied, 4.0 to 6.0 mils dry film thickness.
    - 1) Devoe: 220 Heavy Duty Epoxy Coating
    - 2) PPG: Amercoat 370
    - 3) Sherwin Williams: Macropoxy 646
    - 4) Tnemec: Series 66, Hi-Build Epoxoline, Epoxy-Polyamide
    - 5) Approved equal

- d. Top Coat – Shop or field-applied, 3.0 to 5.0 mils dry film thickness.
  - 1) Devco: 378 Devthane Aliphatic Urethane
  - 2) PPG: Pitthane High Build Urethane, 95-8400 Series
  - 3) Sherwin Williams: Acrolon Ultra
  - 4) Tnemec: Series 73. Endura-Shield; Series 1074 or 1075
  - 5) Approved equal
- e. Protective Coat: Where finish coat is specified by Architect to be Hi-gloss, and/or where recommended by manufacturer to prevent color fading, provide an additional finish coat with a minimum 2.0 mil dry film thickness.
  - 1) Devco: 379 Clear, Aliphatic Urethane
  - 2) PPG: Pitthane 35 Gloss Urethane Enamel, 95 Series
  - 3) Sherwin Williams: Diamond Clad
  - 4) Tnemec: Series 76 Acrylic Polyurethane Clear Coat
  - 5) Approved equal
- f. Top Coat- As a contractor option to an aliphatic urethane top coat plus the protective coat, provide shop or field-applied, 2.0 to 3.0 mils dry film thickness, fluoropolymer polyurethane. Coordinate required gloss and color with Architect.
  - 1) Sherwin Williams: Flurokem HS
  - 2) Tnemec: Series 1070 (gloss), 1071 (semi-gloss) or 1072 (satin)
  - 3) Approved equal
- 8. Products shall be spray-applied to achieve the specified dry film thickness in one coat. Additional coats may be required using roller applications.
- 9. Where a conflict exists between this specification section and other Division 09 paint specifications, e.g. 09 90 00, 09 96 00, 09 97 00, the most conservative and costly alternate shall apply for bidding purposes, unless clarified in writing by the Architect/Engineer.

F. Hot Dip Galvanizing:

- 1. Scope: Hot dip galvanize after fabrication all structural steel items and their connections where specified on Drawings and below:
  - a. All embedded plates in concrete exposed to exterior exposure or corrosive environments.
- 2. Surface Preparation: All steel to be hot dip galvanized shall undergo the following surface preparation as specified by the Steel Structures Painting Council (SSPC), Volume 2.
  - a. Removal of grease, oil, grime and all foreign contaminants by thorough cleaning with an alkaline or organic solvent followed by thorough rinsing in cold water.
  - b. Scale removal by pickling in diluted sulfuric or hydrochloric acid. Pickling shall be followed by a rinse in warm water and a second rinse in cold water. As an alternative to pickling, the steel may be white metal blast cleaned according to SP5 of the SSPC Specification.
  - c. Dipping in a flux solution of zinc ammonia chloride followed by drying at room temperature.
- 3. Zinc Coating: The zinc coating for steel shapes and plates shall conform to ASTM A123, "Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products." Minimum galvanizing shall be the greater of 3.9 mils, or the weight of zinc coating per square foot of surface for 1/8 inch and 3/16" thick steels shall average not less than 2.0 oz. with no individual thickness less than 1.8 oz.; for 1/4" thick and heavier steel the coating weight shall average not less than 2.3 oz. with no individual thickness less than 2.0 oz.
- 4. Where finish top coat is required, prepare galvanized members using SSPC-SP7 cleaning followed by SSPC-SP1 cleaning with M-E-K solvent.
- 5. Provide vent holes where required and in conformance to the guidelines of ASTM A385.
- 6. Straighten members such as channels that have been distorted by the galvanizing process.

G. Cold Galvanizing: Cold galvanizing compound shall be "ZRC Galviline Galvanizing Repair Compound" or "ZRC Cold Galvanizing Compound" as manufactured by ZRC Worldwide, Marshfield, MA. and applied according to manufacturer's instructions.

- 1. For shop applied applications:
  - a. Clean to SSPC-SP6 specifications.
  - b. Apply two coats with a dry-film thickness of 2 mils per coat.

## **PART 3 - EXECUTION**

### **3.01 FABRICATION, DELIVERY AND STORAGE**

#### **A. Fabrication:**

1. Shall be in strict accordance with Reference Standards and Architect/Engineer approved shop drawings.
2. All workmanship shall be equal to the best practice in modern structural shops.
3. All shop connections shall be welded, unless noted otherwise, or unless approved in writing by Structural Engineer prior to shop drawings.
4. Provide all necessary steel bearing plates for reaction of beams and columns, connections, stiffeners, and gussets.
5. Provide all special bearings fabricated of steel plate, angles, etc. welded to beams or columns as required or shown for support of steel joist, concrete plank and metal deck.
6. Cut, drill or punch holes perpendicular to metal surfaces as required for connections, attachments and passage of conduit or piping. Do not flame cut holes or enlarge holes by burning. Provide holes in members to permit connection of work of other trades. If an opening is not shown on Structural Drawings, obtain prior approval.
7. Camber structural members where indicated. All steel beams shall be fabricated with the natural camber (within the mill tolerance) located above the horizontal centerline between the end connections. Straighten members distorted by shop welding procedures. Fabricate exterior spandrel beams with the natural sweep toward the interior of the building.
8. Unless otherwise shown on Drawings, provide double angle framed beam connections in conformance with AISC with the maximum number of 3/4" dia. bolts in a single line with 3" gauge. Use bent plates for skewed beams. Use 1" diameter bolts for single shear, wing plate or single angle connections. Use 5/16" minimum thickness for angles, 3/8" minimum for plates.
9. Mill compression joint surfaces for full bearing (Example: column to base plate connections).
10. Member and assembly tolerances shall conform to AISC specification and ASTM A6.
11. Exposed structural steel used as an architectural design element or exposed to view shall conform to AISC Specification for Architecturally Exposed Structural Steel. As fabricated straightness tolerances shall not exceed one half of the standard AISC and ASTM tolerances. Use only materials which are smooth and free of surface blemishes including pitting, rust and scale, seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating and application of surface finishes.
12. Provide 1/4" thick end plates for all tubes, unless noted otherwise.

#### **B. Shop Painting:**

1. Surface Preparation:
  - a. Remove loose rust, loose mill scale, and spatter, slag or flux deposits. Solvent clean in accordance with SSPC SP-1 and further clean in accordance with one of the following Society for Protective Coatings Specifications (except clean steel that is to receive zinc-rich primer in accordance with SSPC SP-6 "Commercial Blasting"), minimum 2.0 mil angular surface profile.
    - 1) SP-2 "Hand Tool Cleaning"
    - 2) SP-3 "Power Tool Cleaning", and where required for serious corrosion, use SP-11 Cleaning to bare metal.
    - 3) SP-7 "Brush-Off Blast Cleaning".



- ### 3.02 ERECTION

- 210011.00

- B. Erect all structural steel plumb, level and to accurate elevations. Unless otherwise shown on Drawings, follow OSHA Standards and AISC Code of Standard Practice. Do all necessary temporary bracing required.
1. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and the removal of paint on surfaces adjacent to field welds.
  2. Horizontal erection tolerance for edge angles and bent plates at slab edges, openings and roof edges = 1/4" from location shown on drawings (not from as built members). Butt weld edge members to form a continuous member. Angles shall be string line straight and plumb floor to floor.
  3. When tolerances are exceeded, e.g. column out of plumb by more than L/500, fabricator shall do all work to correct and reinforce members, at no cost to Owner.
  4. For bolted column splices, maximum gap at column bearing splices is 1/16 inch. When exceeded, provide solid filler shims and tack weld in place.
  5. Fabricator shall hire a Professional Engineer, registered in the state in which the project is located, for repair details. Submit stamped calculations for review. Repairs shall be performed before any concrete is poured.
- C. Take particular care to have all work plumb and leveled before permanent connections are made.
1. Steel shall be surveyed, for placement within tolerances and corrected before deck is placed. Any member placed outside of tolerances shall be reported to the Architect.
  2. Fabricator shall provide shims on site for erection corrections.
- D. Field connections shall be welded or bolted as conditions require, unless noted otherwise.
1. Do not enlarge unfair holes in members by burning or by the use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.
- E. High strength bolt installation shall follow the Specification for Structural Joints Using ASTM F3125 Grade A325 or Grade A490 Bolts. Snug-tight connections may be used in general except where pretensioned or slip-critical joints are specified on the Construction Documents or Shop Drawings. Joint assembly and bolt tightening of connections for pretensioned or slip critical joints require full pretensioning using AISC turn-of-the nut or calibrated wrench methods. Load Indicator Washers or "Twist-off" type bolts may be used at Contractor option.
1. Except for slotted holes, erector shall not tighten any bolts until after the drift pins have been removed from the connection to reduce potential for slip in the connection. For slotted holes, bolts shall be located in the center of the slot.
- F. Provide washers for the following conditions:
1. For all joints that have sloped surfaces.
  2. When oversized holes or slotted holes are used in the outer ply, use thick washers as required by RCSC specification.
  3. Where maximum hole diameters are used for anchor-rod holes in base plates, provide minimum washer size and thickness, in compliance with AISC Manual.
  4. Under the turned element when using the calibrated wrench pretensioning method.
  5. Under the nut when the twist-off-type tension-control bolt pretensioning method is used.
  6. When the direct-tension-indicator method is used.
  7. Use Load Indicator Washers or "Twist-off" type bolts where drawings or specifications call for high strength friction or "slip-critical" type bolted connections.
- G. Gas Cutting: Do not use gas-cutting torches in the field for correcting fabrication errors in the structural framing. Cutting shall be permitted only on secondary members that are not under stress, as acceptable to the Architect. Finish gas-cut sections equal to a sheared appearance when permitted.
- H. Anchor Bolts: Furnish anchor bolts and other connectors required for securing structural steel to foundations and other in-place work. Furnish 1/4" minimum steel templates for presetting bolts and other anchors to accurate locations. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout. Use only steel wedges or shims.
- I. Furnish and install headed studs in conformance with Specification 05 36 00, approved shop drawings and AWS.

- J. Furnish and install deformed bar anchors in conformance with construction documents, approved shop drawings and AWS.
- K. Miscellaneous Framing: Provide supplemental structural steel support framing for metal deck where normal deck bearing is interrupted by column flange plates or other framing members and other openings whether shown or not on either the architectural, mechanical, or structural drawings.
  - 1. Install pour stops and closure strips to form true and straight perimeter and interior edge conditions. Prevent loss of concrete through gaps and openings at columns and changes in deck direction. Provide tight fitting closures at open ends of flutes. Closures shall not reduce concrete volume around shear connectors and shall permit placing of reinforcing bars in the deck flutes. Upon completion of installation of floor or form deck system, work shall be ready to receive concrete as a suitable form without leaking or loss of concrete fines.
  - 2. Perimeter edge conditions shall meet required tolerances to accommodate curtain wall support systems and fittings.
- L. Use nylon straps or other appropriate means of handling and erecting steel to prevent marring, scraping, bending, twisting, or otherwise distorting architecturally exposed structural steel and/or its coatings.
- M. Join steel components exposed in architecturally exposed steel by continuously welding. Chip, fill with metal body putty, and grind joints smooth to eliminate water pocketing and entering the assembly and provide smooth surface of welds. Provide all welded construction except where specifically shown otherwise on drawings. Remove backing bars and run-off tabs from members exposed to view.

### **3.03 WELDING**

- A. All welding shall be done by skilled, experienced, qualified and State certified operators.
- B. All work shall be in accordance with AWS D.1.1 "Structural Welding Code - Steel".
- C. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent surface bleeding of backside welding on exposed steel surfaces. Grind smooth fillet welds 1/2 inch (13mm) and larger. Grind flush butt welds. Dress exposed welds.
- D. On exposed welded construction, remove erection bolts, fill holes with plug welds, and grind smooth at exposed surfaces.
- E. Headed Studs and Deformed Bar Anchors (DBA's):
  - 1. Follow manufacturer's specifications and guidelines for surface preparation and installation. Fillet welding is not allowed.
  - 2. Do not weld when temperature is below 0 degrees F or surface is wet.
  - 3. Automatically end-weld headed studs and DBA's in accordance with AWS D1.1.
  - 4. Surfaces to receive studs shall be free of foreign material such as rust, oil, grease, paint, etc. When mill scale is so thick as to prevent obtaining proper welds, remove by grinding or sandblasting.
  - 5. Remove ceramic ferrules from studs, DBA's and base material after welding.

### **3.04 CONSTRUCTION LOADS**

- A. During the construction period, the contractor shall provide means for the adequate distribution of concentrated loads so that the carrying capacity of any member is not exceeded.
  - 1. Review plans and consult with Architect to determine allowable uniform live loads.
  - 2. Contractor shall hire a Professional Engineer to determine the adequacy of concentrated loads, e.g. construction equipment point or wheel loads.

### 3.05 FIELD PAINTING

- A. Field-Applied Touch-Up Painting:
1. For interior steel, not exposed to view in a non-corrosive environment, no field touch-up painting is required.
- B. For all other steel conditions, field-applied touch up painting is required.
1. Follow manufacturer's requirements for field painting.
  2. Apply no paint on surfaces upon which there is frost or moisture.
  3. All contaminates such as soil, concrete, weld splatter, grease, or any other deleterious material shall be cleaned from the steel or shop coated surfaces before any painting operations begin. Harsh environments may necessitate re-cleaning during or between paint applications.
  4. Provide SP-1 cleaning and mechanically abrade bare or damaged areas in accordance with SSPC-SP11 Power Tool Cleaning to Bare Metal. Clean "lifted" mill scale.
  5. All galvanized members and connections, including welds, shall be protected with "Z.R.C. Cold Galvanizing Compound" or "ZRC Galviline Galvanizing Repair Compound" as manufactured by Z.R.C. Products Company in accordance with ASTM A780.
  6. Touch up members, field welds and connections with the same surface preparation, material, mil thickness and number of coatings as specified for shop painting, manufacturer's requirements and paint specifications, e.g. 09 90 00, 09 96 00, or 09 97 00, where applicable, whichever is more restrictive. Allow adequate curing time between coatings.
  7. All exposed steel shall be treated as "Architecturally Exposed Structural Steel" (AESS), unless noted otherwise.
    - a. For architectural exposed steel, touch-up of minor damage shall be acceptable where result is not visibly different from adjacent surfaces. Where required by Architect, recoat entire surface where touch-up result is visibly different, either in sheen, texture, or color.
    - b. Touch-up paint all structural steel where any scratches, dings, scuff's, abrasions, etc. are present.
    - c. Remove paint for identification, piece markings and labels and touch-up with paint. Alternatively, piece markings must be labeled in areas that will not be exposed to view.
  8. Field-apply coal-tar epoxy to all steel below grade subject to exterior exposure or corrosive environments such as pools including columns, base plates and anchor bolts.
- C. Field-Applied Finish Coat: Refer to applicable Division 09 paint specifications e.g. 09 90 00, 09 96 00, or 09 97 00.
- D. Weather Conditions:
1. Unless the paint manufacturer's application instructions are more restrictive, paint shall not be applied when the temperature of the air or metal is below 50°F., when freezing weather is forecast during the drying period, or when the metal is hot enough to cause the paint to blister or produce a porous paint film. Also, paint shall not be applied when the air is misty; in the rain, snow, or fog; when the steel surface temperature is less than 5°F. above the dew point, or when conditions are otherwise unsatisfactory.
  2. The Contractor shall provide suitable enclosures to permit painting during unfavorable weather. Provisions shall be made to control atmospheric conditions artificially inside the enclosures within limits suitable for painting during the painting operation and until the paint is dry or until weather conditions permit its exposure in the open.
  3. When painting in the field, wind direction and velocity shall be considered. Paint shall not be applied when wind velocity is continuously greater than 10 mph. The Contractor shall utilize all necessary precautions to prevent undue dispersing of materials outside the work area.
  4. The Contractor shall provide adequate and safe storage for all paint and equipment. Paint materials shall not be exposed to rain, excessive condensation, or temperatures above 110°F or below 40°F. If the manufacturer's storage requirements are more restrictive, they shall be followed.
  5. Paint damaged by any cause shall be replaced by the Contractor at no cost to the Owner.

- E. Protection of Work:
1. The Contractor shall protect all parts of the structure against disfigurement by splatters, splashes, overspray, and smirches of paint or of paint materials. The Contractor shall be responsible for any damage or disfigurement caused by his operations to vehicles, persons, or property, including plants and animals; and he will be required to provide protective measures to prevent such damage.
  2. Any surface, disfigured by splatter, overspray, splashes, smirches, etc., shall be thoroughly cleaned and restored to its original condition.
  3. Any structure or surface damaged by the Contractor shall be restored to its original condition.
  4. The Contractor shall take any necessary precautions to prevent dust and dirt from accumulating on freshly painted surfaces.

### **3.06 CLEAN UP**

- A. Clean up all debris caused by the Work of this Section, keeping the premises neat and clean at all times.

### **3.07 ADDITIONAL STEEL ALLOWANCE**

- A. Include in bid form as a separate line item, the cost of furnishing, detailing, delivering, fabricating, and erecting 3000 lbs. of steel, in addition to that indicated or specified, to be used as directed by the Architect or Structural Engineer. Contractor shall notify Architect and Structural Engineer immediately when any amount of the allowance is used during the course of construction for Allowance Tracking.
- B. Contractor shall submit a unit price per ton for structural steel in place. This unit cost will be used to determine adjustments to the structural steel allowance.
- C. Any unused amount shall be credited to the Owner at the end of the project.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

## SECTION 05 20 00

### STEEL JOISTS

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

- A. Work Included:
  - 1. Furnish all work, labor, materials, equipment and supervision necessary to complete all open web steel joist and joist girder work. Include all bridging, ceiling extensions, anchors, bolts, extended ends, splice plates and other accessories required for a complete installation.
- B. Related Work Specified Elsewhere:
  - 1. Structural Steel - Section 05 10 00
  - 2. Metal Deck - Section 05 30 00

##### **1.02 QUALITY ASSURANCE**

- A. Applicable portions of the following specifications, latest edition, as adopted by the Steel Joist Institute (SJI) shall govern work under this section, except where otherwise herein specified.
  - 1. "Standard Specification for Open Web Steel Joist"
  - 2. "Standard Specification for Joist Girders"
  - 3. "Recommended Code of Standard Practice for Steel Joists and Joist Girders"
  - 4. Technical Digest No. 9 - "Handling and Erection of Steel Joist and Joist Girders"
- B. Joist Manufacturer shall be an active member of the Steel Joist Institute.
- C. OSHA Standard "Safety and Health Regulations for Construction", Part 1926. Conform to applicable requirements including stabilizers, bolting, welding and bridging.
- D. Work Affected by Others: Contractor is solely responsible for the coordination of work of all other trades as it impacts the work of this section, including mechanical, plumbing, electrical and fire protection, with respect to loads and locations, connections, framing, openings, and anything else that may impact the design or performance of joists and joist girders. Contractor's review of shop drawings will be taken to indicate that this coordination has been accomplished.
- E. For non-exposed joists, tickets or other means shall be left on the joist which identify the joist designation.

##### **1.03 SUBMITTALS**

- A. Shop Drawings: Provide in accordance with General Conditions.
- B. Provide Shop Drawings and lists showing mark, quantity, type, location and spacing of all joists. Show bridging type and mark and detail attachment of bridging to joists and to end walls or end members.
  - 1. Indicate connection details and handling instructions and all accessories required for proper installation of joists.
  - 2. Indicate paint type.
  - 3. Indicate capacity for concentrated or non-uniform loads, if applicable.
  - 4. Indicate complete details of field splices.
  - 5. Mechanical Contractor shall review joist and girder shop drawings and provide stamped approval for the location, size and weight of all roof top units and mechanical openings, prior to submittal to Architect/ Engineer.
  - 6. Show design loads and locations of loads for each joist girder.
- C. Submit stamped calculations to Architect for joist girders, joists where slope exceeds 1/2 inch per foot including special ends, and special joists. Member sizes and connections shall be provided.

Calculations shall be made by a Professional Engineer registered in the State in which the project is located and directly employed by the manufacturer.

- D. Shop drawing Bill of Materials shall contain all design load and deflection criteria. Detailer shall provide special joist and girder load diagrams as required.
- E. General Contractor or Construction Manager Responsibilities:
  - 1. Coordinate with and compile all information regarding concentrated loads applied by trade contractors that may affect the design of joists or joist girders.
  - 2. Provide to the designer of these components and the Structural Engineer of Record, the location and weight of rooftop unit equipment and any concentrated loads including mechanical, plumbing, fire protection, electrical, folding partition or basketball hoops.
- F. The name of the joist and joist girder fabricator shall be clearly noted on all shop drawing submittals.
- G. Review of submittals by A/E is only for review of general conformance with the design concept including verification of the design loads shown on the shop drawings. In no case shall this review relieve the contractor of the responsibility for design, general or detailed dimensions, quality or quantity of materials, or any other conditions, functions, performance or guarantees required.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. Material shall conform to Standard Specifications of the Steel Joist Institute.
- B. Top and bottom chords shall consist of double angles, either hot-rolled or cold-formed from hot-rolled material.
- C. Provide bridging with size, type, spacing and end anchorage required by Steel Joist Institute Standard Specifications unless otherwise shown on Drawings.
- D. Anchors:
  - 1. Each joist bearing on steel beams or masonry bearing plates shall be welded to supports on each side in compliance with the structural drawings.
  - 2. Bolts as necessary for erection purposes and permanent connections.
- E. Provide bottom chord extensions wherever ceilings attach directly to bottom chord.
- F. All headers supporting open web joists and bearing on other open web joists shall be designed, furnished and installed by this Contractor. Joist designer shall consider the point load header reaction when designing the joist supporting the header.
- G. Paint: Manufacturer's standard primer.

## **PART 3 - EXECUTION**

### **3.01 DESIGN**

- A. Steel joist and joist girders shall be designed by the manufacturer in accordance with the drawings, project specifications and the SJI. The manufacturer's engineer shall be responsible for the design, adequacy and safety of all members. Design shall be in accordance with SJI Standard Specifications.
- B. Design joists and girders for rooftop unit loads and suspended loads shown on drawings. Coordinate exact location with General Contractor and unit installer.
  - 1. Refer to the structural, architectural, mechanical and fire protection drawings and coordinate with Mechanical Contractor for locations and weights of equipment. Where



such loads do not occur at the panel points, auxiliary framing shall be added or the chord shall be designed for the effects of the load.

2. Fire Protection Sprinkler Pipes

- a. Sprinkler pipe shop drawings and loads shall be provided to joist/girder designer.
  - b. Joist/Girder designer shall apply a minimum 250 lb. concentrated live load to any single fire sprinkler support point to accommodate installation personnel per NFPA 13. The 250 lb. load is not applied concurrently to all support points and is non-concurrent with other live loads such as roof live, floor live, snow, wind, etc. If multiple sprinkler lines are attached to the same joist or girder, the 250 lb. load should be applied at only one location at a time. Design for bending between panel points.
    - 1) Refer to the Structural Plans and General Notes for placing criteria of larger sprinkler pipes.
  - c. The structure is designed for a minimum of 3 psf. for miscellaneous or collateral loads including ducts and sprinklers. Since sprinkler design is provided by a design build contractor, the location of piping mains, or pipes that exceed 3 psf, is unknown by the EOR and not accounted for in the construction documents.
    - 1) Include an allowance in the joist bid to accommodate the effects of sprinkler pipe loads that exceed 3 psf. Coordinate with the Structural Engineer of Record when sprinkler pipe shop drawings are provided.
- C. Design members for any special loads as shown on the Drawings.
- D. Design extended ends for the loads indicated on the drawings but not less than the uniform load capacity of the main span. Limit deflection of superimposed loads to span/360.
- E. Joist girders shall be designed to support the design loads without exceeding a live load deflection of L/360, unless noted otherwise.
- F. When net uplift forces due to wind are specified on the drawings, the manufacturer shall design roof joists, joist girders, bridging and connections to the supporting structure for the net uplift. Provide uplift bridging near the first bottom chord panel points of joists.

**3.02 FABRICATION AND STORAGE**

- A. Steel joists and joist girders shall be fabricated in accordance with the SJI Standard Specifications.
  - 1. Provide tags on joists for ready identification, including the manufacturer's name.
- B. Provide strutted ends of the bottom chord of sufficient strength and rigidity to restrain the lateral movement of the bottom chord.
- C. Joist girders shall be "VG Type" with verticals located directly below joists. Loads specified on plan include girder dead load.
- D. All joists and joist girders shall be cambered. Provide minimum camber per SJI Standard Specification recommendations.
- E. Provide beveled joist bearing seats when joist slope exceeds 1/4" in 12". Provide extended ends, special depth ends, etc., where indicated on the Drawings and as job conditions require.
- F. Extend joist seats to within 1/4" of beam center line when joists bear on both sides of a beam. Extend joist seats across full flange width when joists frame in from one side of beam only.
- G. Maintain steel joists free of dirt and other foreign matter and protect from corrosion. Store joists off ground on platform or skids.
- H. Joists shall be handled with care. At all times they shall be supported at several points to prevent bending and distortion and shall be piled so as to be protected from dampness.

### 3.03 ERECTION

- A. Prior to beginning work of this Section, verify that the installed work of other trades is complete and correct to the extent necessary for the proper execution of the work of this Section.
- B. In the event of discrepancies, immediately notify the Architect. Do not proceed with work affected by the discrepancies until they have been resolved.
- C. The recommendations of the Steel Joist Institute with regard to handling and erection of steel joist and joist girders are hereby made a part of these specifications.
- D. Erect in accordance with AISC, SJI, OSHA and project specifications. Do not erect damaged joists. Obtain corrective repair procedures from manufacturer or replace. Do not field cut, drill or modify joists.
- E. Do not install joists until supporting construction is in place and secured.
- F. Joist shall be hoisted into place by hooking to top chord joints at approximately third (3rd) points.
- G. Install joists and accessories plumb, square and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist Manufacturer's recommendations, and the requirements of this Section.
  - 1. Space, adjust and align joists accurately in location before permanently fastening.
  - 2. Install temporary bracing and bridging, connections and anchors to ensure joists are stabilized during construction.
- H. Provide and anchor bridging per SJI and OSHA requirements. Extend and connect bridging to adjacent beams and concrete or masonry walls. Use diagonal bridging where required by SJI, OSHA, and where shown on drawings.
- I. Install and connect bridging concurrently with joist erection, before construction loads are applied.
- J. Field weld joists in accordance with SJI specifications to supporting steel framework and steel bearing plates.
  - 1. Comply with AWS requirements and procedures for welding, appearances and quality of welds and methods used in correcting welding work.
- K. Bolt joists to supporting steel framework in accordance with SJI specifications.
- L. During the construction period, the contractor shall provide means for the adequate distribution of concentrated loads so that the carrying capacity of any member is not exceeded. Provide reinforcing for chords or webs as required at points of concentrated loads.
- M. Hung Loads: Do not hang any loads from bridging, under any circumstances.
- N. Touch Up Painting: Following installation, promptly clean, prepare, and prime or re-prime field connections, rust spots and abraded surfaces of prime-painted joists, accessories, bearing plates and abutting structural steel.
  - 1. Clean and prepare surfaces by hand tool cleaning, SSPC-SP 2, or power tool cleaning, SSPC-SP 3.
  - 2. Apply a compatible primer of the same type as the shop primer used on adjacent surfaces.
  - 3. Follow specification 05 10 00, Field Painting requirements.
- O. In no case shall any part of a joist or any bridging be cut or altered without the prior approval of joist designer and prior notification of Architect.

END OF SECTION

## SECTION 05 30 00 PAF

### METAL DECK

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

- A. Work Included:
1. Furnish all work, labor, materials, equipment and supervision necessary to complete all metal deck work, as indicated on Drawings and as specified herein.
    - a. Metal roof deck
    - b. Corrugated non-composite metal floor deck (also referred to as metal centering)
    - c. Accessories including closures, hanger devices, edge filler plates, ridge and valley plates, and roof sump pans where shown on the Drawings and/or required for a complete installation.

##### **1.02 QUALITY ASSURANCE**

- A. Manufacturer Qualifications:
1. Steel Roof Deck Manufacturer: Member producer of SDI.
  2. Mechanical Fastener Manufacturer: Member producer of SDI and ISO 9001 accredited for manufacturing quality control.
- B. Applicable portions of the latest version of the following Codes and Standards shall govern work under this section, except where otherwise noted herein:
1. Steel Deck Institute (SDI):
    - a. Manual of Construction with Steel Deck
    - b. Standard Practice Details
    - c. Diaphragm Design Manual
    - d. Deck Damage and Penetrations
  2. ANSI/SDI:
    - a. Standard NC - Standard for Non-Composite Steel Form Deck
    - b. Standard RD - Standard for Steel Roof Deck
    - c. Standard QA/QC - Standard for Quality Control and Quality Assurance for Installation of Steel Deck
    - d. Safety Requirements for Powder-Actuated Fastening Systems (ANSI A10.3)
  3. AISI "North American Specification for the Design of Cold-Formed Steel Structural Members"
  4. ASTM A653, A924, A1008
  5. Welding: Quality procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."
- C. FM Listing: Provide steel roof deck units that have been evaluated by Factory Mutual System and are listed in "Building Materials Approval Directory" for "Class 1A" fire-rated construction and shall be FM classified I-90 minimum for uplift resistance.
1. The steel roof deck shall be FM approved. It is required that each bundle of steel deck or deck panels is labeled with the FM APPROVED mark.
- D. The Contractor shall be responsible for verifying the adequacy of the construction loads on the deck as a form for the intended concrete placement equipment being used and the concrete placement operations. Bulk dumping of concrete using buckets, chutes, or handcarts, or the use of heavier motorized finishing equipment such as power screeds, may exceed the capacity of the deck or connections. Contractor shall consult with deck supplier, or hire an engineer, to verify the adequacy of deck and connections when special loading conditions exist during the construction process.
1. For roof deck, do not overload deck with construction loads such as gravel ballast and equipment.
- E. Items requiring field measuring shall have all dimensions verified in the field before fabrication.

- F. All shop drawings and details shall be checked by the Contractor to verify existing conditions and coordination with all other trades.
- G. Erector's Qualifications: Minimum five years' experience in installation of similar decking.
- H. Welding: If welding of deck is desired and approved by A/E, personnel and procedures are to be qualified per the requirements of the American Welding Society, AWS D1.1 "Structural Welding Code-Steel", and AWS D1.3 "Structural Welding Code-Sheet Steel", for the type of welding to be performed.
  - 1. Per AWS 1.3, Welding Contractor shall provide a Procedure Qualification Record (PQR) where essential welding changes require changes to the Welding Procedure Specification (WPS) and re-qualification of arc spot welds including changing the electrode or electrode melting rate, amperage, voltage, etc. When parameters change, then the arc spot welds shall be re-qualified.
- I. All mechanical fastener installers shall be certified or licensed by the fastener and tool system manufacturer on the project site in accordance with ANSI A10.3 requirements. Certification or licensing includes all training necessary for proper tool operation, fastener selection, maintenance and troubleshooting.
- J. Preconstruction Conference:
  - 1. A preconstruction conference prior to steel deck attachment is required when powder actuated fasteners (PAF) are used.
  - 2. A Hilti (or approved equal) representative shall meet with contractor, installer, and inspectors to review the decking specification, verify the correct fasteners are used properly in accordance with the manufacturer's recommendations, and provide training.
- K. Test Fastenings:
  - 1. Welds: Perform project specific test welds prior to final installation per AWS D1.3. Test welds are considered examples of representative work.
  - 2. Mechanical Fasteners: Gauge powder-actuated tool systems to the base material steel type, steel deck type and thickness prior to final installation. Confirm appropriate power regulation and powder-actuated cartridge type prior to final installation.
- L. Field Quality Control:
  - 1. Test Agency: Contractor shall engage a qualified independent testing and inspecting agency to perform field tests, inspections and prepare reports. Scope of work shall be in accordance with ANSI/SDI Standard QA/QC, Appendix 1 for Quality Assurance (QA).
    - a. Review welding certificates.
    - b. Verify fastening pattern to structural members and sidelap fastening complies with construction documents.
    - c. Inspect deck welds, accessory welds, and side lap connections. Examination and qualification of puddle and fillet welds shall be in accordance with AWS D1.3 criteria. Ensure steel roof deck is clamped to the supporting steel framing.
    - d. Verify proper size and installation of mechanical fasteners. Examine fastener placement location and washer condition. Ensure steel roof deck is clamped to the supporting steel framing.
    - e. Verify thickness, finish, size and type of metal decking and accessories.
    - f. Verify extent of touch-up primer.
  - 2. Testing agency shall report inspection results promptly and in writing to the Contractor and Structural Engineer.
  - 3. Remove and replace work that does not comply with specified requirements, at no cost to Owner.
  - 4. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

### 1.03 SUBMITTALS

- A. Shop Drawings:
  - 1. Before proceeding with fabrication, submit Shop Drawings to Architect for review showing

- deck layout and orientation, connections and details in accordance with General Conditions.
- 2. Show all sizes, locations and marking of decking units, the sizes of holes to be cut in the shop, type of end closures and fittings, cover plates, cell closures, sump pans and all accessories.
  - a. Refer to drawings and coordinate with trade contractors for size and location of all roof openings, roof drain details, skylight and roof hatch details.
- 3. Indicate type and location of all attachments to supports and sidelaps in clear, graphic detail.
  - a. Mechanical fasteners, either powder actuated, pneumatically driven, or screws, shall be permitted if fasteners meet all project strength and service requirements.
  - b. Where mechanical fasteners are used, provide manufacturer's literature including a submittal showing that the diaphragm capacity meets or exceeds project requirements.
  - c. Shop drawings shall indicate clearly on plan the proper mechanical fastener based on the flange or top chord thickness of the support member. Detailer shall verify thickness of joists and steel members with suppliers.
  - d. Any fastening substitution or change shall be approved by the Structural Engineer. Documentation in the form of test data, design calculations, or design charts should be submitted by the fastener manufacturer as the basis for obtaining approval. Strength of mechanically fastened connections is dependent upon both deck and support thickness.
- 4. Indicate type of finish: painted, G60 galvanized and/or G90 galvanized.
- B. Provide welding certificates.
- C. Provide deck galvanizing certificates.
- D. Inspection service shall provide electronic field reports to A/E immediately following inspections.
- E. Mechanical Fastener Representative shall provide electronic report to A/E to prove compliance with Q/A requirements.

#### **1.04 DELIVERY, STORAGE AND HANDLING**

- A. Protect steel deck, accessories, welding electrodes, fasteners and finish from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Do not rack, bend or mar steel deck sheets.
- C. Store above ground with one end elevated for drainage. Follow SDI Manual of Construction guidelines.
- D. Cover deck with waterproof material, but ventilate to avoid condensation.
- E. Maintain decking free of dirt and other foreign material.
- F. Replace all damaged material.

### **PART 2 - PRODUCTS**

#### **2.01 FABRICATION, MANUFACTURE AND MATERIALS**

- A. Manufacture in strict accordance with "Specifications for the Design of Light Gauge Structural Members" by the American Iron and Steel Institute. Load shall meet or exceed that published by Steel Deck Institute in "Design Manual for Floor Decks and Roof Decks." Maximum deflection under total loading shall be 1/240 of the clear span. Approved manufacturers:
  - 1. Epic Metals Corporation
  - 2. Vulcraft, Nucor Corporation
  - 3. Canam

4. New Millenium Building Systems
  5. Approved equal
- B. Manufacture deck from steel conforming to ASTM A611, Grade C and ASTM A446, Grade A, or approved equal. Deck shall have a minimum yield strength of 33 KSI. Minimum thickness of material supplied shall be within 5% of design thickness.
- C. Roof Deck:
1. 1-1/2", 22 gauge (0.0295 design thickness), wide rib Type B, deck with galvanized finish.
    - a. Galvanized deck and accessories shall conform to ASTM A525, G60.
  2. 3", 20 gauge (0.0358 design thickness), Type N, metal deck with galvanized finish, unless shown otherwise on drawings. Galvanized deck and accessories shall conform to ASTM A525, G60.
  3. Security Deck: 3", 16 gauge (0.0598 design thickness), G60 galvanized, Type N roof deck. Provide two layers such that total height is 6".
- D. Where possible, deck shall be fabricated long enough to extend over three (3) or more spans and in no case shall units extend over less than two (2) spans.
- E. Ribs and flutes shall be formed so as to provide a substantial horizontal lap of adjacent pieces through which both thicknesses of deck can be welded to supports. Deck panels formed with vertical termination at lap are not acceptable.
- F. Accessories such as cover plates, starter plates, cant strips, closures plates, ridge plates, etc. shall be provided as shown on Drawings, specified herein or as required to complete installation, 20 gauge minimum, with same finish as deck.
- G. Pour Stops, Closure and Cover Plates:
1. Provide end closures of minimum 20 gauge to close the open ends of roof deck at end walls, eaves and openings through roof.
  2. Provide cover plates of minimum 20 gauge and 10" width at end joints between adjoining but non-lapping deck units and at changes in deck direction. Provide Z-shaped cover plates where abutting joist seat heights are not of equal height. At ridges and valleys, provide bent cover plate to match deck pitches.
  3. Fabricate metal floor closure strips of not less than 12 gauge cold formed sheet steel. Provide 1" minimum return lip.
- H. Mechanical Fasteners:
1. Powder Actuated or Pneumatic Fasteners for General Construction: Carbon steel knurled shank; minimum 1/2" diameter steel washer; electroplated zinc conforming to ASTM B633, SC 1, Type III; meet SDI design requirements and Factory Mutual approval:
    - a. Hilti X-HSN 24 for bar joist and structural steel 1/8" to 3/8"
    - b. Hilti X-ENP-19 L15 for structural steel, hardened structural steel, and heavy bar joist 1/4" thick or greater
    - c. Simpson Strong-Tie 5/8" dia. XL Large-Head (XQ1S1016). Do not use Simpson fasteners for the project if connection to any steel member with flange thickness greater than 3/8" is required
    - d. Approved equal
  2. Galvanized Sidelap Fasteners for General Construction:
    - a. Hilti S-SLC 01 M HWH, Hilti S-SLC 02 MHWH, or Hilti #10 HWH Screw
    - b. #10 TEK self-tapping (Buildex Corp., ITW)
    - c. Simpson #10 screw (XQ1S1016, X1S1016, or XY34S1016)
    - d. Approved equal
    - e. Button punches are not allowed
  3. When the fasteners are powder actuated or pneumatically driven, the strength per fastener used to determine the maximum fastener spacing is based on a minimum structural support thickness of not less than 1/8 inch (3mm) and on the fastener providing a minimum 5/16 inch (8mm) diameter bearing surface (fastener head size). Fasteners shall not be installed into structural supports which are outside the acceptable limits of the manufacturers applicable test report or other documentation.

4. When the structural support thickness is less than 1/8 inch (3mm), powder actuated or pneumatically driven fasteners shall not be used unless lesser support thicknesses are permitted by applicable fastener test report or other documentation acceptable to the Structural Engineer. Screws shall be acceptable for use without restriction on structural support thickness, however, the screw selected shall have a grip range compatible with the combined thickness of the deck and supporting member.
- I. Roof Sumps:
    1. Furnish and install at each roof drain 14 gauge galvanized steel recessed sump pan with top pitched to suit roof slope and with sufficient bearing to overlap deck not less than 6" all around. Bottom of pan is to be level when installed and is to be not less than 1-1/2" below roof deck surface.
    2. Furnish and install 24" x 30", 14 gauge flat sump plate at all roof drains.
  - J. Rubber sound and air barriers, or firesafing at fire walls, to seal flutes on underside of roof deck shall be provided at all walls and partitions.
    1. Closed cell foam rubber, one inch thick; profiled to fit tight to the deck.
  - K. Painting:
    1. Galvanized finish per ASTM A653 and ASTM 924
    2. Chemically cleaned, provide phosphate coating and baked on rust inhibiting enamel primer in factory
    3. Clean and treat deck as required for fireproofing or paint adherence.

### **PART 3 - EXECUTION**

#### **3.01 INSPECTION**

- A. Examine alignment or level of supporting walls or members for inaccuracies. Bring to attention of Architect before installation. Installation of decking shall be construed as acceptance by Contractor of supporting walls or members and any cost of replacing deck due to walls or alignment will be borne by this Contractor.

#### **3.02 ERECTION**

- A. Erect and attach in accordance with SDI Specifications, Structural Drawings, manufacturer's recommendations, ICC-ES AC43 designs, final approved Shop Drawings, welding specifications, applicable safety regulations and manufacturer's recommendations.
- B. Locate deck bundles to prevent overloading of supporting members.
- C. Deck sections shall be accurately placed end-to-end and adjusted for proper alignment and spacing between abutting sections before being permanently attached to supporting steel or anchor plates. Provide 2" minimum laps located only over supports. Roofs having a slope of 1/4 inch or more in 12 inches shall be erected beginning at the low side to insure that laps are shingle fashion.
- D. Marking: Mark each piece of steel roof deck at the centerline of each supporting steel member prior to fastening to prevent the attachment from missing the structural member, and to prevent weld burn through or mechanical fastener punch through. Use an indelible marker.
- E. Steel deck panels shall be placed straight and true with a maximum 1/4-inch horizontal misalignment in 100 feet length.
- F. Construction Loads: Do not use deck as storage or working platform until it has been permanently attached to supports. Ensure that construction loads do not exceed the carrying capacity of the deck.
- G. Deck Attachment, (unless noted otherwise on drawings):
  1. 1-1/2" Roof Deck shall be attached with powder actuated fasteners to supports at 6" centers at ends and 12" maximum at intermediate supports. Where supports are

- greater than 4'0" centers, provide two sidelap fasteners per span.
2. 3" Roof Deck shall be attached with powder actuated fasteners to supports at 8" centers (at both ends and intermediate supports). Screw sidelaps with (8)-#10 TEK sidelap fasteners per span.
  3. Screws and fasteners shall be tight, straight and fully seated. Replace or supplement under-driven and over-driven fasteners with adjacent, properly installed fasteners.
    - a. Steel joists may have an angle on one side of centerline that is higher than the other. Make attachments to the higher joist angle.
- H. 5/8" diameter puddle welds may be used as a one-for-one substitute for Powder Actuated or Pneumatic Fasteners. Fasteners shall meet or exceed SDI diaphragm values for specified system. Provide additional side laps as required. Install per manufacturer's and SDI requirements.
- I. Cutting of all openings through deck 16 square feet or less and all skew cutting shall be done in field.
- J. Openings shall be properly reinforced per details on drawings. Trades that subsequently cut unscheduled openings through the deck shall be responsible for reinforcing these openings based upon an approved engineered design.
- K. Deck plates, accessories, reinforcements and closure plates shall be installed according to Manufacturer's requirements. Closure plates shall be welded with 1" long weld at 12" centers along each edge or more often if required to assure laying flat. Weld drain plates at 6" centers and at corners.
  1. Form to provide tight fitting closures at open ends of cells or flutes and sides of decking. Provide sheet metal closures at all slab edges, columns, walls, and openings unless steel angles or bent plates are specified in details on the drawings. Also, provide wherever deck stops or changes direction. Provide minimum 2" bearing over steel support.
- L. Metal Deck Contractor to measure shut offs on decking so that they are plumb from floor to floor.
- M. All welding shall be done by electric shield arc process using E60XX low hydrogen electrodes by certified welders in strict accordance with the deck manufacturer's specifications with no butts, sharp points or edges. All welding shall follow AWS D1.3 "Specification for Welding Sheet Steel In Structures." Weld washers are not necessary and are not recommended for roof deck 22 gauge and thicker.
  1. All welds shall be uniform in size and appearance and free of pinholes, porosity, undercutting or other defects.
  2. Any holes burned through deck by improper welding shall have closure plate of same gauge and finish as decking fitted to conform to deck and seal opening.
  3. Units with weld holes burned through deck and visible from below will be rejected. Units bent or damaged before or during erection which impair their quality or appearance will be rejected. At completion, units shall be solid.
- N. Do not hang or support any loads from the underside of metal roof deck except for horizontal suspended ceilings weighing not more than 4 pounds per square foot including the weight of mechanical, electrical, and plumbing components supported by the ceiling. Ceilings shall be supported at a maximum of four feet on center.
- O. Deck Repair:
  1. Where deck will be exposed to view, remove and replace any units with damage or defect which cannot be concealed by painting.
  2. Where deck will not be exposed to view, repair any cuts and holes with plate of same gage as deck.

### **3.03 PROTECTION AFTER ERECTION**

- A. Steel decks utilized as "finished ceiling" products shall be protected from moisture and must never be subjected to corrosive substances such as salts, fertilizers or other chemicals or to prolonged contact with dissimilar materials. All steel decks must be protected from erection operations or during site storage that could distort the panel's configuration.



- B. Planking or other protection shall be placed when buggies, wheeled laser screeding apparatus, or like equipment are utilized in the concreting operation. Planks or other protection shall be of adequate stiffness to transfer loads to the steel deck without damaging the deck.
- C. Prior to concrete placement, the steel deck shall be free of soil, debris, oil, standing water and all other foreign matter.
- D. Concrete shall be placed such that the deck will not be damaged by impact or overloading. The Contractor retains responsibility for ensuring proper concrete placement methods are followed.

### **3.04 FILLING AND PAINTING**

- A. Cover weld holes with a 4" x 6" piece of deck and tack in place.
- B. Upon cooling, welds shall be wire brushed, cleaned and given touch-up coat of paint on top and bottom of deck surface, which will be compatible with the interior paint system, if any. Touch up galvanized deck with cold-galvanizing repair paint applied per manufacturer's instructions.
  - 1. Repair in accordance with SDI publication "Deck Damage and Penetrations".
- C. All abrasions, scarred areas, cut or untreated edges, rust spots and bare spots due to transit and erection and charred opposite side of welds shall be wire brushed and primed with approved cold-galvanizing primer by this Contractor.
- D. Finish painting to exposed areas shall be by Painting Contractor as specified in Section 09 90 00.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

## SECTION 31 00 00

### EARTHWORK FOR BUILDING

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

- A. Work Included: Furnish all work, labor, equipment, materials and supervision necessary to complete all earthwork within building footprint, including area wells and retaining walls attached or adjacent to the building, including:
1. Site clearing, grubbing, stripping, and earth moving.
  2. Excavation, filling, backfilling, compaction and grading.
  3. Preparation of subgrade for slabs on grade, walks, pavements, roads and parking areas.
  4. Proofrolling of Subgrade.
  5. Furnish, apply and rough grade topsoil.
  6. Removal of structures at or below grade.
  7. Provide and pay for all necessary permits.
  8. Shoring, cribbing and bracing to safely support excavations.
  9. Contractor shall determine if the site "balances" and include in their bid any import or export of material including any spoils from utilities.
- B. Related Work Specified Elsewhere:
1. Section 31 40 00 Underpinning
- C. Work Not Included:
1. Fine grading and spreading of topsoil - Section 32 90 00.
  2. Construction of roads, exterior parking areas, etc.
  3. Excavating and backfilling inside and outside of building as required for plumbing, heating and electric work installed underground, including tanks, pits, manholes, catch basins and inlets, which are included in other Sections.

##### **1.02 REFERENCE STANDARDS**

- A. Latest edition of following specifications and recommended practices shall become part of this specification as if written herein. Wherever requirements conflict, the more stringent shall govern.
- ASTM A444 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process for Culverts and Underdrains
- ASTM C136 - Sieve Analysis of Fine and Coarse Aggregates
- ASTM C207 - Hydrated Lime for Masonry Purposes
- ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method
- ASTM D422 - Particle Size Analysis of Soils
- ASTM D423 - Liquid Limit of Soils
- ASTM D424 - Plastic Limit and Plasticity Index of Soils
- ASTM D698 - Moisture-Density Relations of Soils and Soil-Aggregate. Mixtures using 5.5 lb. Rammer and 12 inch Drop (Standard Proctor Test)
- ASTM D1452 - Soil Investigation and Sampling by Auger Borings
- ASTM D1557 - Moisture Density Relations of Soils and Soil- Aggregate Mixtures using a 10 lb. Rammer and 18 inch Drop (Modified Proctor Test)

ASTM D2167 - Density of Soil in Place by the Rubber-Balloon Method

ASTM D2487 - Classification of Soils for Engineering Purposes

ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregates in Place by Nuclear Methods (Shallow Depth).

OSHA Standard "Safety and Health Regulations for Construction", Part 1926.

Standard Specification for Highway and Structure Construction, State of Wisconsin, (SSHSC).

**Applicable Local and State specifications governing work of this section.**

**1.03 QUALITY ASSURANCE**

- A. Perform earthwork in compliance with local, state and OSHA requirements and codes.
- B. All work shall be in accordance with manufacturer's and supplier's instructions.
- C. Project Site Information: A geotechnical report has been prepared for this Project and is available for information only. The report is not a part of the Contract Documents. The opinions expressed in this report are those of the geotechnical engineer and represent interpretations of the subsoil conditions, tests, and results of analyses conducted by the geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from this data by Contractor.
  - 1. Make additional test borings and conduct other exploratory operations as necessary.
  - 2. The geotechnical report is included elsewhere in the Project Manual.
- D. Testing and Inspection Service: Contractor shall engage soil testing and inspection service (Geotechnical Engineer) for quality control testing during earthwork operations.
  - 1. Testing agency representatives on the site are required to read and understand the requirements of the Construction Documents, the Soil Report and this Section. Contractor shall verify this condition.
  - 2. Approval of Fill Materials: Fifty (50) pound representative samples of each type of proposed fill material required shall be submitted by Contractor to the testing laboratory for analysis and optimum moisture and maximum density determinations. The cost of all retesting because of unacceptable proposed fill material or change in source of fill material shall be borne by Contractor by means of a credit with a Contract Change Order. Approval by the laboratory must be given prior to the start of any fill placement.
    - a. Approval of material based on laboratory tests may not guarantee compaction acceptability of material on site, given time of year and climatic conditions. Contractor shall substitute materials as required and as approved by Geotechnical Engineer to achieve specified requirements on the site.
    - b. In order to be approved, materials to be used as backfill material for basements and retaining walls shall not develop equivalent fluid pressure greater than those specified on the structural drawings or the geotechnical report.
    - c. Provide electronic copies of material testing reports directly to Architect and Engineer.
  - 3. Proofrolling, undercutting, and fill operations shall be performed under the observation of the Geotechnical Engineer.
  - 4. Field density tests for determining the acceptability and compaction of existing soils and fill will be made frequently during the progress of the work in accordance with standard recognized procedures for making such tests.
    - a. At a minimum, perform at least one test for the top of existing soils and each lift of fill material placed, and at least one test for each 2500 square feet of area per lift, but in no case fewer than 3 tests. Take at least one compaction test for each lift for every 25 feet for wall footings, and 50 feet for utility trenches. Perform one to four tests for each column footing, depending on footing size.
    - b. All required testing will be performed by the testing laboratory. Contractor shall cooperate as required in the making of these field tests.
    - c. Perform a passing retest at each prior failing test area. The costs of any retesting

required because of the failure of compacted areas to meet specification requirements shall be borne by Contractor by means of a credit with a Contract Change Order.

5. Testing agency shall perform hand auger borings, minimum 1-1/2" diameter, to a depth of 4 feet below bearing elevations or as required, dynamic cone, pocket penetrometer or other tests of excavations to verify soil bearing pressures and acceptability. Test probes shall be performed at a maximum of 25 feet apart within continuous strip footing trenches and at least one probe within each isolated column pad excavation.
  6. Approval by Geotechnical Engineer must be given prior to the placing of any concrete or fill material, and whenever the Soil Report or actual conditions encountered indicate loose or variable soil conditions, variable soil coloration, unexpected materials, excessively wet soils, etc. Do not proceed if unsuitable conditions are encountered. Notify Structural Engineer immediately.
  7. Testing agency shall provide directly to Owner, Architect and Structural Engineer electronic field reports that topsoil and unacceptable soils have been removed, reports of actual bearing pressures encountered, and all compaction tests. Provide written verification that existing soils and fill materials achieve specified bearing capacity at all locations including lawn and unpaved areas.
  8. Provide Geotextile Fabric Information to Geotechnical Engineer for review.
  9. Geotechnical Engineer shall review and approve required location and installation of geotextile fabric and provide electronic report directly to Structural Engineer.
- E. Submittals:
1. Provide electronic copies of all quality assurance testing reports sent directly to Architect and Structural Engineer.
- F. Construction Limits: Confine work to the Construction Limits as indicated on the drawings. In the absence of such a designation on the drawings, confine work to the minimum area reasonably necessary to undertake the work as determined by the Architect. All areas disturbed by excavation and grading, plus such additional areas as are disturbed by construction related activities including construction access and storage and installation of materials shall be considered the "Construction Area." In no case shall construction activities extend beyond property lines or construction easements.
- G. The Contractor shall restore all disturbed areas in accordance with the drawings and specifications. If plans and specifications do not address restoration of specific areas, these areas will be restored to pre-construction conditions as approved by the Architect.
- H. Wherever provisions of the Specification, Drawings, the Soil Report, including supplements and addenda, or the requirements of Geotechnical Engineer conflict (e.g. compaction materials, required percent compaction, etc.), the more stringent requirements shall govern unless approved in writing by Structural Engineer.
- I. Conform to Federal, State and local ordinances with respect to excavations, disposal of waste, burning, air quality, noise, erosion, water runoff, etc.
- J. Record Drawings: Maintain record drawings of all underground utilities, drain tiles, or other structures encountered, and/or earthwork made as part of this project on original drawings prepared by the installing Contractor/ Subcontractor.
- K. Earth Retention System: Contractor is completely responsible for the design, construction, maintenance and removal of adequate and safe temporary (and permanent, if applicable) shoring, bracing, retaining structures and excavations. Any damage to new or existing construction, inside or outside of the project limits, caused by construction techniques or movement of the soil retention system, is the sole responsibility of the Contractor. All systems shall be designed for potential sand seams and water, which may cause cave-ins, and/or require additional bracing, casing of bore holes, dewatering, etc.
- L. Off-Site Storage: Refer to Division 01.
1. In general, the payments for materials stored off site will only be considered in instances where there is limited space available for storage on the site. Prior approval by the

Architect, together with the execution of a Storage Agreement will be required.

## **PART 2 - PRODUCTS**

### **2.01 FILL MATERIALS**

- A. Structural/Engineered Fill: Well graded, granular material, bankrun sand and gravel, or crushed or natural stone, free of shale, clay, friable materials and debris; tested in accordance with ANSI/ASTM C136 within the following limits:
1. Maximum size of aggregate shall be 2" with not less than 80% passing on a 3/4 inch sieve, with not less than 50% by weight passing a No. 4 sieve.
  2. Not more than 15% shall pass the No. 200 sieve, except that not more than 5% shall pass the No. 200 sieve (free-draining) for basement wall backfill. Alternately, for basement and area well wall backfill, use 3/8" to 1-1/2" uniform crushed aggregate (clear crushed stone), and provide geotextile against other soils and embankment, subject to Geotechnical Engineer's approval.
  3. For non-basement, building frost walls, suitable and approved clay backfill may be used only when existing soils are clay, subject to geotechnical engineer's approval.
  4. Provide a clay "cap" at the top of granular backfill at building exterior walls, retaining walls and utility trenches in non-pavement exterior locations, 1'-0" thick minimum or as required by the Soil Report, whichever is greater, over a geotextile fabric to separate clay from granular fill.
  5. Where sites are predominantly clay, or where clay fill is used, other than natural ground water, isolate any water source, such as a pond or creek, from basement or retaining wall backfill with anti-seep collars, clay or concrete cut-off walls or other means to completely eliminate horizontal water flow into granular backfill material and back to building.
  6. When used for bedding under pipes, conduits or culverts, fill shall consist of material with greater than 50% by weight passing a No. 4 sieve and all particles passing a 1 inch sieve. Bedding material shall be selected and placed in accordance with the recommendations of the pipe manufacturers and in accordance with Chapter 6.43 of *Standard Specifications for Sewer and Water Construction in Wisconsin, Latest Edition*.
    - a. Fill above utilities including utility trenches, shall be granular material (with clay caps if existing soils are clay).
    - b. Where sites are predominantly clay, or where clay fill is used, for all utilities and other excavations, provide anti-seep, concrete collars or clay cut-off walls ("trench plug"), or other suitable means to cut off water where a water source could flow back to building.
  7. Structural/Engineered Fill shall achieve the required soil bearing pressure specified in the Contract Documents and Geotechnical Report.
- B. Except for lean concrete, no other materials than as described above, may be used as structural fill within the building footprint and within at least six feet beyond the perimeter walls, plus an additional width of one foot for each foot of subcut required below bottom of footing (1H:1V oversizing).
- C. For site material beyond structural fill at perimeter walls, except for backfill against basement and retaining walls and except below pavements, other materials may be used as structural fill subject to Geotechnical Engineer's recommendation, review and approval and Structural Engineer's review and approval. Material shall achieve specified minimum net soil bearing capacity and compaction requirements. Geotechnical Engineer shall review the following:
1. Material description per the Unified Soil Classification System, liquid and plastic limits. Clay soils shall be low-expansive with a Liquid Limit less than 45% and a Plasticity Index greater than 11% and less than 20%.
  2. Gradation percentages.
  3. Requirements for preparation of material.
  4. Requirements for methods of compaction, including equipment.
  5. Information regarding frost resistance and expansion characteristics compared to structural fill specified.
  6. Unsatisfactory Soils: ASTM D2487 soil classification groups ML, MH, CH, OL, OH, and PT, or a combination of these group symbols, and satisfactory soils not maintained within

specified percent of optimum moisture content at time of compaction.

- D. Drainage Fill: Frost resistant, well graded, clean, angular/fractured, crushed stone or gravel (not sand), free of silt, clay, loam, friable or soluble materials, and organic matter; tested in accordance with ANSI/ASTM C136 within the following limits:
1. Not more than 5% shall pass the No. 200 sieve, (free-draining)
    - a. Slab on grade subgrade: ASTM C33, Size 67.
    - b. Building perimeter drain lines shall be surrounded with at least 12 inches of washed aggregate conforming to ASTM C33, Size 67.
    - c. Perimeter drains at retaining walls shall be surrounded with at least 12 inches of washed aggregate conforming to ASTM C33, Size 67.
- E. Retaining Wall Fill: Backfill placed within the influence area of retaining walls must be classified as a clean free draining SW, SP, GW or GP, granular soil per Unified Soil Classification System (ASTM D-2487) and shall meet the requirements of drainage fill.
1. If 3/8" to 1-1/2" uniform crushed aggregate (clear crushed stone) is used, provide geotextile against other soils and embankment, subject to Geotechnical Engineer's approval.
  2. Backfill shall be compacted material which develops a maximum active equivalent fluid pressure of 40 pcf.
  3. The influence area slopes upward at 60 degrees from the outside edge of the top of footing on the retained side of the wall.
- F. Exterior Pavement Subbeds (Base Coarse Aggregate):
1. Wisconsin DOT Standard Specifications Section 304, crushed stone or gravel gradation No. 2.
  2. Crushed stone or gravel graduation No. 2 per state DOT specification.
- G. No. 2 Stone: Angular crushed limestone aggregate having uniform particle size of nominally 2 inches, essentially free of fines.
- H. Lean Concrete: Minimum 1,500 psi compressive strength at 28 days.
- I. Controlled Low Strength Material (CLSM): Ready-mixed material consisting of Portland Cement, Class C Fly Ash, sand, gravel and water. Minimum 100 psi, Maximum 300 psi compressive strength at 28 days. For Fly Ash, maximum loss of ignition shall not exceed 3%. Material shall be fill or backfill in lieu of compacted soil and shall be excavatable using normal construction excavation methods. The minimum thickness shall be 6".
- J. Common Fill: Approved material from site, excavation or off- site, separated from materials which do not compact by tamping or rolling. Crushed stone, bankrun gravel, or coarse sand or general earth material free of particles larger than 6 inches, debris, peat, roots, cinders, wood, trash, organic material or other objectionable material.
- K. No construction materials, organic, deleterious, frozen or "contaminated" material may be used for backfilling or fill material.
- L. Geotextile Fabric: Conforming to WISDOT 645 and Soil Report with respect to Grab, Puncture and Burst Strength, Trapezoidal Tear, Permativity, and Apparent Opening Size, as approved by Geotechnical Engineer.
1. Around stone surrounding drintile and trench drains. WISDOT 645.2.4 Type DF, Type A or better:
    - a. "Mirafi 140-N"
    - b. "ADS 5000"
    - c. "Amoco 4547"
    - d. "Contech C-45NW"
    - e. Approved equal
  2. Under slab-on-grade drainage fill for all basements, when specified on plans, soil report, or as required by Geotechnical Engineer based on field conditions encountered during construction. WISDOT 645.2.2 Type SAS:
    - a. "Mirafi 180-N"

- b. "Mirafi FW404"
  - c. "ADS 8800"
  - d. "Amoco 4553"
  - e. "Contech C-80NW"
  - f. Terra Tex-N08"
  - g. Approved equal
- 3. Soil stabilization and subgrade reinforcement above poor soils, when specified on plans, soil report, or by Geotechnical Engineer based on field conditions encountered during construction. Geotextile is required whenever clear stone is used as a substitute for fill against a wall or where clear stone is installed over or against clay or silt soils. WISDOT 645.2.3 Type MS:
  - a. "Mirafi HP370"
  - b. "Amoco 2016"
  - c. "Contech C-400"
  - d. Approved equal
- M. Hydrated Lime (Calcium Hydroxide)
  - 1. Comply with ASTM C207.

## **2.02 TOPSOIL**

- A. Existing topsoil on site will be stripped and stored by this Contractor.
  - 1. Topsoil remaining or shortage after all work is completed shall be disposed of or imported at no cost to Owner.
- B. Topsoil to be Furnished: If quantity of stored topsoil is inadequate or if none has been salvaged from site, this Contractor shall furnish sufficient topsoil to properly construct lawns. Topsoil furnished shall be a natural, fertile, friable soil, possessing characteristics of representative productive soils in the vicinity. It shall be obtained from naturally, well-drained areas. It shall not be excessively acid or alkaline or contain toxic substances which may be harmful to plant growth. Topsoil shall be without admixtures of stones, stumps, roots, debris or other objects 1" or more in diameter which might be a hindrance to planting operations. Topsoil shall be placed to a minimum depth of 6" after compaction for seed and sod areas, and to a minimum depth of 18" for landscaped areas as indicated on Landscape Drawings.
- C. Rough grading and placement of topsoil is by this Contractor. Final grading of topsoil will be by Landscape Contractor - Section 32 90 00.

## **2.03 MISCELLANEOUS**

- A. Traffic barricades, traffic signs, and warning devices shall meet the requirements of applicable OSHA standards and the FHWA Manual on Uniform Traffic Control Devices (MUTCD), latest edition.

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- A. Establish all heights and grades to properly execute work from bench mark established by others.
- B. Contractor shall provide all surveys to accurately locate the construction on the site.
- C. Prior to start of work, Contractor shall be completely familiar with all conditions at the site, and shall account for conditions that may affect the work including limitations on work access, space limitations, overhead obstructions, traffic patterns, local requirements, adjacent activities, etc. Failure to consider these requirements shall not be cause for claim of job extras.
- D. Inspect areas and conditions prior to clearing, excavating, filling, and grading. Do not proceed until unsatisfactory conditions have been corrected.



- E. Permits and Fees:
  - 1. Apply for, pay for and secure all permits required in connection with the work under this section from the governmental authorities having jurisdiction.
  - 2. Pay all highway and dumping fees and repair damage to sidewalks, streets, or other public property, or to any public utilities.

### **3.02 MAINTENANCE OF SITE AND BUILDING ACCESS/EGRESS**

- A. Unless otherwise shown or directed, maintain existing access and egress to the facility throughout construction. Maintain ANSI A117 compliant access for disabled persons, delivery access, emergency vehicle access, and emergency egress. Do not interrupt access and egress without prior written approval from the Architect.
- B. Do not interrupt or change existing traffic, delivery, or parking without prior written approval from the Architect. When interruption is required, coordinate schedule with the owner to minimize disruptions. When working in public right-of-way, obtain all necessary approvals and permits from applicable municipalities having jurisdiction and WISDOT.
- C. When Contractor's activities impede or obstruct traffic flow, Contractor shall provide traffic control devices, signs and flaggers in accordance with other Contract Documents and the current version of the Federal Highway Administration Manual on Uniform Traffic Control Devices, or as shown on the Drawings.

### **3.03 PROTECTION**

- A. Protect structures, utilities, sidewalks, pavements, signs, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork and dewatering operations. Protect and maintain all lawns, beds, shrubs, trees, and other work that is to remain in place.
  - 1. Should damage occur as a result of work performed under this Contract, restore to existing condition at no additional cost to Owner, in a manner acceptable to Architect.
  - 2. Repair or replace trees and vegetation indicated to remain which are damaged by construction operations, in manner acceptable to Architect.
- B. Conduct site clearing operations to ensure minimum interference with roads, streets, walks and other adjacent occupied or used facilities. Do not close or obstruct roads or other occupied or used facilities without permission from Owner and authorities having jurisdiction.
- C. Carefully remove items indicated to be salvaged, and store on Owner's premises where indicated or directed.
- D. Provide and maintain temporary fences, planking, lights, warning signs, barricades and guards necessary for protection of premises and public.
- E. Maintain cut at satisfactory slope which will prevent collapse of embankments. Provide bracing and shoring as required to protect existing improvements, including outside contract limits, new construction or excavations. Contractor is solely responsible for strength and adequacy of bracing or shoring and for safety. Conform to OSHA requirements. Restore any damaged improvements to their original condition.
- F. Do not load vehicles hauling debris excessively as to cause spillage on to streets and roadways. Do not allow spilled materials to clog drainage of streets.
- G. Keep sidewalks and streets adjoining the property broom clean and free of debris, excavated materials, rubbish, trash and obstructions, which might affect the safety of streets, walks, utilities and property. Broom clean daily.
- H. Use all means necessary to control dust on and near the work, if such dust is caused by the Contractor's operations during performance of the work, or if resulting from the condition in which the Contractor leaves the site.

- I. Provide positive protection (mat/sheet coverings) for all excavation slopes to protect slopes from instability and deterioration due to rain, wind or snow/ice.
- J. Construct, maintain and protect erosion and sedimentation controls.

### **3.04 EXISTING UTILITIES**

- A. The Contract Drawings show such information as can reasonably be obtained regarding the location and nature of pipe lines, storm sewers, water lines, natural gas lines, underground cables, etc. However, the accuracy or completeness of such information is not guaranteed. It shall be Contractor's responsibility to locate such underground features sufficiently in advance of operations to preclude damage to same.
- B. Contact Diggers Hotline. Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations to avoid disruption of service.
- C. Should uncharted or incorrectly charted, piping or other utilities be encountered during excavation, consult Architect and appropriate utility company immediately for directions. Cooperate with Owner and utility companies for keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility company. The cost of repair of uncharted or incorrectly charted utilities will be paid on the basis of Changes In The Work defined in the Conditions of the Contract.
- D. Do not interrupt existing utilities serving facilities occupied and used by Owner or others except when permitted in writing by Architect and then only after acceptable temporary utility services have been provided. Provide minimum of 48-hour written notice to Owner, and receive written notice to proceed before interrupting any utility. Describe the nature and duration of outages and provide the name and number of Contractor's foreman or other contact.
- E. Any service connections encountered which are to be removed shall be cut off at the limits of the excavation and capped in accordance with the requirements of applicable codes and any specifications governing such removals.
- F. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of service if lines are active.

### **3.05 SITE CLEARING AND GRUBBING**

- A. Clear area within contract limits of trees, stumps, roots, brush, shrubs, vegetation, rubbish, debris, and other perishable or objectionable matter.
  - 1. Remove all cleared material from site.
  - 2. Trees to be removed are indicated on drawings.
  - 3. Existing bituminous and concrete paving, roads, walks, and curbs shown removed on drawings shall be removed by this Contractor.
  - 4. Completely remove stumps, roots, and other debris protruding through ground surface. Use only hand methods for grubbing inside drip line of trees indicated to remain.
  - 5. Remove existing above-grade and below-grade improvements, unsuitable fill, cinders, concrete, old foundations and any other unsuitable material as indicated on Drawings, soil report or interfering with new construction.
  - 6. Burying or burning of materials on the site is not permitted.
  - 7. Trim limbs and branches of trees to be left in place which overhang roadbeds or structure to provide proper clearance.
- B. To minimize erosion, limit heavy equipment travel only to that necessary to complete clearing and grubbing.
- C. Repair damaged erosion control features immediately.

### 3.06 SITE GRADING

- A. Topsoil:
1. Follow the requirements of landscaping plans and specifications. Where conflicts exist, the more restrictive requirements shall govern.
  2. Strip all topsoil to the full depth of all organic matter under all areas requiring cutting or filling, and areas of new construction.
  3. Remove heavy growths of grass from areas before stripping.
  4. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines or within a 15 foot radius, whichever is greater, to prevent damage to root system. Area shall be free of construction work or traffic.
  5. Stockpile topsoil on site in storage piles in areas indicated or directed. Coordinate with other contractors. Construct storage piles to provide free drainage on site of surface water. Cover storage piles, if required, to prevent wind erosion.
  6. Dispose of unsuitable or excess topsoil same as specified for disposal of waste material.
  7. Do not excavate, grade or work topsoil in frozen or muddy condition.
  8. Minimize compaction of topsoil to the extent possible.
- B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- C. Preparation of subgrades after stripping vegetation, organic or other unsuitable materials shall consist of:
1. Proof-rolling under the observation of an experienced Geotechnical Engineer or Technician to detect soft, wet, yielding soils or other unstable materials. Proof rolling shall consist of rolling the subgrade with a heavily loaded rubber tired vehicle such as a loaded scraper or tandem axle dump truck.
    - a. Undercut soft or unsuitable areas of subgrade as directed by Geotechnical Engineer. Backfill with structural fill in maximum 8 inch loose lifts, and compact to the minimum required degree of compaction as specified in Compaction Section.
    - b. Remove the top 18" of the subgrade where expansive clays (Liquid Limit greater than 50) are encountered. Replace with granular structural fill or provide lime treatment.
    - c. Remove, as directed by Geotechnical Engineer, underlying bearing soils that are disturbed by construction, weather or earthwork activities, and replace with structural, engineered fill.
    - d. In pavement areas, backfill half of undercut with No. 2 stone placed in 8" lifts and compacted until no further vertical and lateral movement is observed. Backfill upper half of undercut with Base Coarse Aggregate placed in 8" lifts and compacted as specified in Compaction Section.
    - e. Provide Geotextile Fabric before backfilling, if soft soils exist at bottom of excavation.
    - f. Proof-roll all drainage fill under slabs-on-grade and pavement sub-beds.
  2. Scarify top 6 to 8 inches.
  3. Moisture condition soils as required.
  4. Recomposition to same minimum in-situ density required for similar materials.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect or Geotechnical Engineer, without additional compensation.
- E. All subgrades shall consist of and be:
1. Underlain by suitable bearing material.
  2. Free of all organic, frozen or other deleterious material.
  3. Observed, tested and approved by Geotechnical Engineer.

### 3.07 CUT AND FILL

- A. Provide all necessary cutting and filling required to change existing grade specified or as shown on drawings.
1. Rough grade all seeded areas to 6" below finish grade elevation. Where topsoil of

- sufficient depth is encountered, grade shall be brought to final established grade.  
Minimum depth of topsoil shall be 6".
2. All roads, etc. shall be rough graded as required to install subgrade and finish pavement.
- B. Fill in excess of 12" shall be constructed in 8" layers and shall be rolled with rubber tired equipment or sheepfoot rollers, or compacted with vibratory equipment, whichever is best suited for soil being compacted.
1. Fill under paved areas shall be compacted to 95 percent Modified Proctor, as per ASTM D1557.
- C. Where there is a great change in grade, a maximum slope of three to one (3:1) shall be maintained.
- D. Do no grading until sewers, water mains and other utilities are installed. After backfill has settled and when directed, fill shallow places to bring to proper grade.
- E. Excess excavated material from trenches and other excavations will be piled on site if to be reused, or removed from site by respective Contractors. Deposition and spreading shall be done by this Contractor.
1. 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.
  2. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

### **3.08 EXCAVATION**

- A. Excavate and remove whatever materials encountered, including existing pavements, abandoned building foundation walls, footings and slabs, and unsuitable fill as required to place within finish elevations shown, all footings, walls, trenches, pits, ground floor slabs, drain tiles inside and around basement to complete the project.
- B. Extend excavations outside of footings, walls, etc. far enough to permit proper inspection, placing and completion of all work.
1. Where engineered fill is to be used between existing bearing soils and the bottom of footings or slabs, excavate unsuitable material at a 45 degree angle downward, beginning 1'-0" beyond the outside edge of the foundation on all sides, to bearing soil.
- C. Level off the bottom of footing trenches and remove all loose soil to receive concrete work.
- D. Excavated earth shall remain on site, if possible, and placed where directed.
1. After final grading work is complete, remove any excess earth from premises. Where site constraints dictate, excavated earth shall be stored off-site or landfilled.
  2. All surplus earth shall be removed from premises.
- E. Additional Excavation:
1. When excavation has reached required subgrade elevation, notify Architect and Geotechnical Engineer for inspection of conditions.
  2. If unsuitable bearing materials are encountered where shallow foundations are used at the required subgrade elevations, carry excavations deeper and replace with acceptable bearing material as directed by Geotechnical Engineer.
  3. Unless specifically identified as part of the Contract Documents, removal of unsuitable material below expected elevations as defined in the soil report or Contract Documents and its replacement as directed will be paid on the basis of Changes In The Work defined in the Conditions of the Contract.
- F. Unauthorized Excavation: Consists of removal of materials beyond indicated subgrade elevations, limits or dimension without specific direction of Geotechnical Engineer. Unauthorized excavation, as well as remedial work directed by Architect and/or Geotechnical Engineer, shall be at Contractor's expense.
1. Under foundation bases, grade beams, or retaining walls, fill unauthorized excavations with lean concrete to bring elevations to proper position.

- G. Frost Protection: All open footings, trenches and exposed floor slab areas must be protected against frost impregnation. No footings or slabs shall be placed into or against subgrade containing free water, frost or ice. Should water or frost enter a footing or structural excavation after subgrade approval, the subgrade shall be re-inspected by the Geotechnical Engineer after removal of water, frost, or ice.
- H. Stability of Excavations:
  - 1. Slope sides or excavations to comply with governing codes and ordinances, including OSHA Subpart P of 29 CFR 1926, or successor regulations. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
    - a. Unless required otherwise by code or unless authorized by Geotechnical Engineer, slopes for excavations 20 feet deep or less should not exceed 1:1 for soil Types A and B and 1-1/2 (horizontal):1 (vertical) for soil, Type C.
  - 2. Maintain side and slopes of excavations in a safe condition until completion of backfilling. The Contractor shall provide positive protection (Mat/Sheet Coverings) for all excavation slopes to protect slopes from instability and deterioration due to rain, wind, snow, or ice.
  - 3. Do not allow sidewall soils to spall into excavation.
- I. Do not place excavated materials where they will inconvenience the public, impede travel, or impede surface drainage unless such drainage is being safely rerouted away from the excavation without causing other damage. Do not place excavated materials close to a trench or excavation, unless shoring of adequate strength is provided to support the additional loads that are imposed.
- J. Remove and replace sidewalk and curb in areas of excavation to the nearest joint. Minimum removal shall be three feet wide. Remove all pavements, including curbs and gutters, to neat and straight lines to the limits of removal by a two-step method. Limit the initial removal to the immediate area of the proposed work. Full depth sawcutting is not required for this phase of the removal. After the work is completed, and immediately prior to the pavement replacement, make a full depth sawcut to neat and straight lines outside the widest point of excavation. Make the lines of sawcut parallel to existing joints, or parallel or perpendicular to pavement edges so as to form a neat patch. Carefully remove all remaining pavement within the sawcut area to the lines of the sawcut. Do not disturb existing base materials between the area disturbed by the work and the sawcut line during the sawcutting, pavement removal, or pavement replacement processes.
- K. If field tile are encountered during the excavation, the Contractor shall make provisions for continuing the drainage on an interim basis and immediately notify the Architect and Geotechnical Engineer. Field tiles shall be re-routed wherever possible.

### **3.09 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.
  - 2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.
  - 3. Provide control measures to prevent damage from flooding, erosion, and sedimentation to on-site and off-site areas.
- C. Maintain pit or pits to which all excavated parts shall be drained. Provide, operate and maintain suction and discharge lines, pumps and other equipment necessary to drain and keep all excavations, trenches and entire subgrade area free of water under any and all circumstances which may arise. All water, snow or ice must be removed from excavation or trenches before pouring concrete.
  - 1. Flooding of any excavation after approval of the subgrade will be cause for complete removal of concrete mud slabs or footings and complete reparation and approval of the

- subgrade.
- 2. Notify Geotechnical Engineer if springs or water seepage are encountered during grading/foundation construction for possible construction procedure revisions or inclusion of or revision to an underfloor drainage system. Coordinate with Geotechnical Engineer.
- 3. If actual water flows are greater than expected, notify Geotechnical and Structural Engineer immediately.
- 4. Provide dewatering bags (Ero-tex filter bags, 262-250-9940, or equal) to clean water before releasing it. Change sock as required to meet DNR requirements.

### 3.10 GEOTEXTILE FABRIC

- A. Installation of geotextile shall be reviewed and approved by Geotechnical Engineer.
- B. Install in accordance with this Specification, WISDOT 645, Soil Report and Manufacturer's Specification and Requirements with a minimum overlap of two (2) feet.
  - 1. Provide geotextile fabric below drainage fill at all basements or below grade areas.
  - 2. Provide geotextile where required for soil stabilization, to separate existing soils from granular or gravel fill, as required by this Specification, Geotechnical Report, or as required by field conditions as determined by Geotechnical Engineer during construction.
  - 3. Provide geotextile around clear stone used as backfill against walls.
  - 4. Provide around drain tile, wherever shown on drawings and/or recommended/specified in the Soil Report.
  - 5. Where piping vertically intersects the Geotextile Fabric, run fabric up pipe and tape prior to backfilling.
  - 6. Where horizontal piping is installed after and below the Geotextile,
    - a. Cut the Geotextile in a line centered on the pipe excavation and fold back.
    - b. After pipe installation, backfill to the bottom of the Geotextile, fold the fabric back, and tape the joint.
    - c. Tape a 4 foot wide strip of Geotextile, centered over the cut joint.

### 3.11 BACKFILL AND FILL

- A. General: Place acceptable tested and approved soil material in layers to required subgrade elevations, for each area classification listed below.
  - 1. Structural/Engineered Fill:
    - a. Use as fill or backfill in excavations against walls (except as noted in Item 2), under walks, steps and pavements and under interior building slabs, except as noted in Item 3 below.
    - b. Where soil bearing pressures do not exceed 5000 psf, use as bearing material below footings and above natural occurring bearing soil where unsuitable material has been removed.
      - 1) Structural fill shall be placed in the foundation "influence zone". The "influence zone" begins 1'-0" from each side of the bottom of the footing and slopes downward at a pitch of 1 horizontal to 1 vertical.
    - c. If bearing soils are disturbed, or if footings are left unpoured overnight, remove and fill with 2" minimum thickness lean concrete under footings. Alternative protection systems may be used subject to Geotechnical Engineer's approval.
    - d. Construct footing excavations using backhoe buckets with smooth edges (i.e., no teeth).
    - e. Amount or width of structural fill against walls shall be per this specification, as shown on drawings, or as directed by Geotechnical Engineer. The more stringent requirement shall be used.
  - 2. Retaining Wall Fill: Use as fill or backfill in retaining wall zone of influence and excavations.
  - 3. Drainage Fill:
    - a. Use as final 6" minimum layer (or greater as shown on Contract Documents or Soil Report) for granular sub-beds under all interior and exterior floor slabs resting on earth and exterior sidewalks, and steps.
      - 1) The subgrade shall be uniformly compacted and proof-rolled to ensure against settlement.
      - 2) The surface shall be maintained in a firm, clean, dry and smooth

- condition.
- 3) Repair truck rutted or pumping areas prior to slab-on-grade placement.
- b. Where vapor barrier/retarder or other membrane is specified to be placed above Drainage Fill:
- 1) Provide a minimal sand layer to fill stone voids and smooth stone edges. Foreign materials and protrusions shall be removed, and all cracks and voids shall be filled and the surface made level, or uniformly sloping as indicated on the drawings. The prepared surface shall be free from loose earth, rocks, rubble and other foreign matter. Generally, no rock or other object larger than USCS sand (SP) should remain on the subgrade in order to provide an adequate safety factor against puncture.
- c. Use around all drain tile, piping, etc. prior to backfilling with structural fill.
4. Exterior Pavement Subbeds: Use as final 6" minimum layer (or greater as specified on Contract Documents or Soil Report) for granular crushed stone sub-bed under exterior drives, parking areas, sidewalks, below concrete slabs, stairs and ramps. Proof-roll subbeds prior to pavement placement. See Soil Report for pavement design requirements.
  5. Controlled Low Strength Material: May be fill or backfill in lieu of common fill or for approved alternate structural fills where free-drainage is not required; e.g. below footings.
  6. Lean Concrete: May be fill or backfill in lieu of common fill or for approved alternate structural fills where free-drainage is not required; e.g. below footings. Use for concrete "mud mats" under footings where specified or required.
  7. Common Fill: Use under unpaved exterior areas.
- B. Prior to Backfill Placement: Backfill excavations as promptly as work permits but not until completion of the following:
1. Acceptance by Geotechnical Engineer of construction below finish grade.
  2. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
  3. Inspection, testing and approval of underground utilities and systems by trades, utilities and municipality having jurisdiction.
  4. Contractor shall survey locations of underground utilities for Record Documents.
  5. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.
  6. Removal of mud, water, caved-in, softened or disturbed soil, or frozen soil as directed by Geotechnical Engineer.
  7. Removal of trash and debris.
  8. Immediately prior to slab-on-grade construction, the exposed subgrade shall be proof-rolled as per Site Grading Section of this Specification.
  9. When existing ground surface has a density less than that specified under "Compaction" for the particular area classification, break up the ground surface, pulverize, moisture-condition to the optimum moisture content, and compact to required percentage of maximum density.
- C. Placement and Compaction:
1. Place backfill and fill materials in layers not more than 8" in loose depth for material compacted by heavy compaction equipment, and not more than 4" in loose depth for material compacted by hand-operated tampers. Equipment shall be compatible with type of soil to be compacted.
  2. Place backfill and fill materials evenly adjacent to structures to required elevations. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around structure to approximately same elevation in each lift. Lifts should be placed horizontally and in uniform thicknesses.
  3. Where fill is to be placed unbalanced against grade beams or retaining walls, provide adequate bracing prior to placement of fill. Do not remove bracing until backfilling operations are complete.
  4. Do not backfill against basement walls until the top of the wall is braced by the structural floor. Structural concrete floor shall have cured a minimum of 7 days prior to backfilling.
  5. Place backfill simultaneously on both sides of free-standing structures.
  6. Extend fill a lateral distance of at least 1 foot for each foot of new fill required, with a

minimum of six feet (6') beyond the edge of buildings and foundations, unless noted otherwise. Against basement walls, free-draining granular structural backfill should extend a lateral distance of at least 4 feet from the outside face of the wall, unless noted otherwise.

7. Provide drainage fill materials for retaining walls within the zone of influence.
8. Notify, coordinate and cooperate with Testing Agency regarding placement of fill. Each layer must be approved before the next layer is started.
9. Provide concrete slurry under pavements.

### 3.12 COMPACTION

- A. General: Control soil compaction during construction, providing minimum percentage of density specified for each area classification.
- B. It is the responsibility of the Contractor to provide all necessary compaction equipment and other grading equipment that may be required to obtain the specified compaction. Compaction of controlled backfill by travel of grading equipment will not be considered adequate for uniform compaction. Hand guided vibratory or tamping compactors will be required whenever controlled backfill may be placed adjacent to walls, footings, columns or in confined areas.
- C. Percentage of Maximum Density Requirements:
  1. Compact soil to not less than the following percentages of maximum dry density determined in accordance with ASTM D1557, Modified Proctor Test. For clay soils, use ASTM D698 Standard Proctor Test and add 3% to percentages specified below, not to exceed 100%.
  2. Foundations/Engineered Fill: For fills less than or equal to 8 feet thick, scarify and recompact the top 12" of existing soils and each layer of backfill or fill material to 95% maximum dry density. For fills greater than 8 feet thick, compact to 100% maximum dry density.
  3. Building Slabs and Steps: Scarify and recompact the top 6" of existing soils and each layer of backfill or fill material to 95% maximum dry density.
  4. Against basement walls, retaining walls and other walls with unbalanced soil pressures: 90% maximum dry density, except the top 5 feet below a driveway or loading dock shall be 95%. If crushed stone backfill or other single sized aggregate with less than 5% passing the #200 sieve is used as wall backfill, provide geotextile against earth at base and side of excavation, and stone shall be placed in maximum two foot lifts, or less as required by Geotechnical Engineer. Lifts shall be nested firmly in place with vibratory compaction as it is placed. Lift depths and vibratory compaction shall be monitored by the Geotechnical Engineer during placement. Expected settlements shall be less than or equal to other structural fill performance.
  5. Lawn or Unpaved Areas: Scarify and recompact the top 6" of existing soils and each layer of backfill or fill material to 88% maximum dry density, except future expansion areas shall be 95% maximum dry density.
  6. Sidewalks: Scarify and recompact the top 6" of existing soils and each layer of backfill or fill material to 95% maximum dry density.
  7. Pavements: Scarify and recompact the top 12" of existing soils and each layer of backfill or fill material to 95% maximum dry density or until additional passes over the crushed stone produce visually no additional compaction. Fill over-excavations with slurry.
  8. Utility trench backfill shall be compacted to at least 90% of the Modified Proctor (ASTM D1557) maximum dry density from 1 foot above the top of the pipe or conduit up to final surface grade to minimize subsidence. Under structures and pavements, compaction shall be at least 95%. Trench backfill should be placed in lifts of 12 inches or less. Placement shall conform to Standard Specifications for Sewer and Water Construction in Wisconsin.
- D. Moisture Control:
  1. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material. Scarify or disk as required to distribute water uniformly through soil. Apply water in manner to prevent free water appearing on surface during or subsequent to compaction operations. The moisture content of the soil should be within -1.0% to +2.5% for cohesive soils, -3% to +3% for cohesionless soils, of the optimum moisture content as determined by ASTM D1557.



2. Remove and replace, or scarify by repeatedly plowing and discing during favorable weather conditions to air dry, soil material that is too wet to permit compaction to specified density.
3. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to a satisfactory value.
4. Clay soil bearing capacity and compaction levels are highly affected by water and construction activities.
  - a. Contractor shall place foundation concrete as soon as possible, use a crushed stone working mat in conjunction with a geotextile, or cast a lean concrete mud slab at the base of the foundations immediately after excavation.
  - b. Clay soils may require continued moisture control, modification with Portland Cement or hydrated lime, and/or per Maintenance Section of this specification until drainage subgrade and slab on grade are installed.

### 3.13 FINAL GRADING

- A. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades. If fill is to be placed and compacted at the edge of a slope steeper than 4H:1V, overfill a minimum of 2 feet laterally beyond the final grade and trim back to design slope after achieving required degree of compaction.
  1. Contractor shall be solely responsible for determining all earthwork quantities based on the existing and proposed elevations provided on the plans.
  2. Contractor shall be solely responsible for balancing site materials. If onsite excavation and borrow operations do not provide enough suitable material for fill areas, Contractor shall coordinate and pay for excavation, transport and placement of imported material meeting the specifications of the contract documents. If excavation results in excess materials, Contractor shall coordinate and pay for loading, transport and offsite disposal of excess materials.
- B. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes.
  1. All contours and/or spot elevations shown on Drawings are to finish grade (i.e. top of pavement, topsoil, etc.). Contractor shall be responsible for making excavations or embankments to the subgrade elevations necessary such that the addition of the pavement, topsoil or whatever surface improvement, will ensure that finished grades are met.
  2. Contours indicated on drawings are the finished grade elevations. Review all grade elevations before commencing work to insure that proper slopes for drainage, slopes for drives, walks, paving, etc., are maintained. If Contractor believes a deficiency is apparent, he shall notify the Architect for clarification and correction.
  3. Pavements:
    - a. Shape the surface of the areas under pavement to line, grade and cross-section, compacted as specified, and graded to prevent ponding of water after rains. Rough grade tolerance shall conform to +0 in./-1 1/2 in. Fine grading tolerance shall conform to +0 in./-3/4 in.
    - b. Include such operations as plowing, discing, and any moisture or aerating required to provide the optimum moisture content for compaction.
    - c. Fill low areas resulting from removal of unsatisfactory soil material, obstructions, and other deleterious materials, using structural fill material. Shape to line, grade, and cross-section as shown.
  4. Ditches: Finish ditches to ensure proper flow and drainage. Conduct final rolling operations to produce a hard, uniform and smooth cross-section.
- C. Grading Surface of Fill Under Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of +0 in./-3/4 in.
- D. Compaction: After grading, compact subgrade surfaces to the percentage of maximum density for each area classification.

- E. Preparation for Seed and Sod Construction: Preparation of Subgrade: Grade and uniformly compact subgrade so that it will be parallel to proposed finished grade. Loosen subgrade materials and mix to a depth of 8". Remove all stones over 1" in size and remove all sticks and rubbish. Do not move heavy objects, except lawn rollers, over lawn areas after the subgrade soil has been prepared unless subgrade soil is again graded and loosened, as specified above, before topsoil is spread.
- F. If salvaged topsoil is not enough to fill to correct thickness, this Contractor shall provide additional topsoil at no cost to Owner.

### **3.14 GRAVEL SUB-BEDS**

- A. Grade Control: During construction, maintain lines and grades including crown and cross-slope of subbase course. Grade and compact earth to required level to receive full depth of pavement or floor construction, including sub-beds, slab and floor finish.
- B. Shoulders: Place shoulders along edges of subbase course to prevent lateral movement. Construct shoulders of acceptable soil materials, placed in such quantity to compact to thickness of each subbase course layer. Compact and roll at least 12 in. (0.3 m) width of shoulder simultaneously with compacting and rolling of each layer of subbase course.
- C. Placing:
  - 1. Place subbase course material on prepared subgrade in layers of uniform thickness not to exceed 8", conforming to indicated cross-section and thickness. Maintain optimum moisture content (within -1% to +3%) for compacting subbase material during placement operations.
  - 2. Wet down gravel sub-beds before pouring concrete.
  - 3. Placing tolerance: +0 in./-3/4 in.
- D. If tests by the Geotechnical Engineer indicate work does not meet specified requirements, recompact or remove work, replace and retest at no cost to Owner.

### **3.15 MAINTENANCE**

- A. Protection of Graded Areas:
  - 1. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
  - 2. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- B. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape and compact to required density prior to further construction.
- C. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

### **3.16 DISPOSAL OF EXCESS AND WASTE MATERIALS**

- A. Removal from Owner's Property:
  - 1. Remove excess and waste materials, including excavated material, trash and debris, and dispose of it off Owner's property.

### **3.17 CLEAN UP**

- A. Level off all waste disposal areas and clean up all areas used for the storage of materials or the temporary deposit of excavated earth. Remove all surplus material, tools and equipment.
- B. Thoroughly clean all drainage ways, roads, parking lots, sidewalks, and paved surfaces and remove and dispose of all debris and mud.

### **3.18 CHANGES IN VOLUME OF EARTH EXCAVATION**

- A. Increases or reductions in amounts of fill and backfill material resulting from changes in the dimensions of foundation structures authorized by the Structural Engineer or removal of unspecified, unsuitable material shall be adjusted on a Time and Materials Basis.
  - 1. Contractor shall hire an independent surveyor to verify all material quantities.

### **3.19 UNANTICIPATED SUBSURFACE CONDITIONS**

- A. Owner has had a subsurface exploration performed by Geotechnical Engineer, the results of which are contained in the Consultant's report. The Consultant's report presents conclusions on the subsurface conditions based on the soil exploration. Contractor acknowledges review of Consultant's report and any addenda thereto and that the bid for earthwork operations is based on the subsurface conditions as described in that report. It is recognized that a subsurface exploration may not disclose all conditions as they actually exist and that conditions may change, particularly groundwater conditions, between the time of a subsurface exploration and the time of earthwork operations. In recognition of these facts, this clause is entered into the Contract to provide a means of equitable additional compensation for Contractor if adverse unanticipated conditions are encountered and to provide a means of rebate to Owner if the conditions are more favorable than anticipated.
- B. If Contractor encounters conditions that are different during earthwork, paving and foundation construction operations than those anticipated by Geotechnical Engineer's report, this fact shall immediately (within 24 hours) be brought to Owner's attention. If Owner's representative on the construction site observes subsurface conditions which are different than those anticipated by the Soil Report, this fact shall immediately (within 24 hours) be brought to Contractor's attention. Once unanticipated conditions have been identified, and Consultant has concurred, immediate negotiations will be undertaken between Owner and Contractor to arrive at a change in contract price for additional work or reduction in work because of the unanticipated conditions. Contractor agrees that unit prices as stated in the Bid Form shall apply for additional or reduced work under the Contract. For changed conditions for which unit prices are not provided, the additional work shall be paid for on a time-and-material basis.

### **3.20 ALLOWANCE AND UNIT PRICES**

- A. Include in bid form as a separate line item as an allowance, the cost of removing unsuitable soils and replacement with structural fill, the greater volume as specified below:
  - 1. Contractor shall include an allowance for an 18" deep undercut for "Excavation Below Subgrade" (EBS) caused by soft, wet, or rutting subgrades:
    - a. For granular subgrades, use 10% of the building footprint and paved areas.
    - b. For clay subgrades under buildings, use 100% of the building footprint. Include the cost of a geotextile fabric below the structural fill.
    - c. For clay subgrades under paved areas, in lieu of an undercut, provide lime or cement stabilization of the upper 18" of the clay soils for 100% of the paved area.
  - 2. Volume of overexcavation as required per information provided in the Soil Report. Contractor shall provide volume calculations.
  - 3. Volume of overexcavation as specified on the Contract Drawings. Contractor shall provide volume calculations.
  - 4. Any unused amount shall be credited to Owner at end of Project.
- B. Contractor shall submit unit prices in the bid form. Unit costs will be used to determine adjustments to the Contract.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

## SECTION 31 00 05

### CIVIL GENERAL REQUIREMENTS

#### **PART 1 - GENERAL**

##### **1.00 INDEX**

02 41 13	Site Demolition
31 05 00	Common Work Results for Earthwork (Outside the Building Footprint)
31 23 16.13	Trenching
31 23 19	Dewatering
31 25 00	Erosion Control
32 05 00	Common Work Results for Exterior Improvement
33 05 00	Common Work Results for Utilities
33 11 00	Water Utility Distribution Piping
33 30 00	Sanitary Sewerage Utilities
33 32 00	Wastewater Pumping Station
33 40 00	Storm Drainage Utilities

##### **1.01 DESCRIPTION**

- A. Work Includes:
1. Furnish all labor materials, tools, equipment, and services for all civil work as indicated, in accord with provisions of Contract Documents.
  2. Completely coordinate with work of all other trades.
  3. Although such work is not specifically called out on drawing, the contractor shall furnish and install all miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.
  4. See Division 01 for General Requirements.
- B. Drawings Use and Interpretation:
1. Drawings are diagrammatic and indicate general arrangement of site features, dimensions, utility tags are provided as a courtesy. All lengths and dimensions shall be verified by Contractor in advance of bidding, otherwise, the more expensive option shall be deemed to be included.
  2. Field verify locations and arrangement of all existing site features.
  3. If any errors or omissions appear in Drawings, Specifications, or other documents, bidding Contractor shall notify Engineer no later than ten (10) days prior to submitting bid. Should conflict occur in or between drawings and specifications, bidding contractor is deemed to have estimated more expensive way of doing work, unless he shall have asked for and obtained written decision (addendum) before submission of bid as to which method or materials will be required.
- C. Installation of all systems and materials is subject to clarification as indicated in reviewed shop drawings and field coordination drawings.

##### **1.02 QUALITY ASSURANCE**

- A. Perform all work and install materials and equipment in full accordance with the latest applicable rules, regulations, requirements, and specifications of the following:

State and Federal Laws  
Local laws, codes and ordinances  
American Society for Testing and Materials (ASTM)  
American Water Works Association (AWWA)  
Federal Highway Administration (FHA)  
Environmental Protection Agency (EPA)  
Wisconsin Department of Safety and Professional Services (SPS):  
Chapter NR 141 - Monitoring Well Construction

- B. Conflicts, if any, which may exist between the above items, the more restrictive shall govern.

### 1.03 SUBMITTALS

- A. General:
1. The A/E's review of shop drawings or samples shall not relieve the Contractor of responsibility for any deviation from the contract documents. The Contractor shall include with the shop drawings an index sheet detailing all deviations from the contract documents, and will be held responsible for all deviations unless he has received written approval from the A/E for the specific deviation, separate from general shop drawing approval. The A/E's review shall not relieve the contractor from responsibility for errors or omissions in the shop drawings or samples.
- B. Shop Drawings:
1. As indicated in Divisions 03, 31, 32, and 33.
  2. The Contractor shall review the shop drawings and stamp with his approval prior to submitting shop drawings to A/E for review.
  3. Shop drawings shall be submitted electronically in one PDF format file for each specification section. Submittals shall be grouped together to include all the required items for that specification section. Piece meal submittals will be rejected. File name shall contain specification number and specification section name. Each shop drawing shall contain the following:
    - a. Cover Sheet: The submittals shall contain a cover sheet, which shall include the following information.
      - 1) Submittal Date
      - 2) Specification Section(s)
      - 3) Manufacturer's Representative (Contact Name, address, and telephone number)
      - 4) Project Name, Project City, Project State, and Project Address.
    - b. Product Data: Manufacturer's product data sheets and description of all system components. These data sheets shall be highlighted or suitably marked, so that included items and options are indicated. On data sheets that include multiple products, the products that are not used shall be crossed out.
- C. Samples:
1. As indicated in Divisions: 03, 31, 32, and 33.
- D. Approval Documents:
1. Prepare and submit all drawings, calculations, and professional seals as required to Federal, State and local authorities having jurisdiction.

### 1.04 JOB CONDITIONS

- A. Cause as little interference or interruption of existing utilities and services as possible.
1. Schedule work which will cause interference or interruption in advance with Owner, Architect, authorities having jurisdiction and all affected trades.
- B. Examine Contract Documents to determine how other work will affect execution of civil work.
- C. Determine and verify locations of all existing utilities on or near site.
- D. Make arrangements for and pay for necessary permits, licenses, and inspections.
- E. Record drawings:
1. Keep a complete set of all civil drawings in job site office for showing actual locations of utilities and other features encountered, modifications to proposed grades and site features, and other deviations from the original design.

2. Use this set of drawings for no other purpose.
3. Where any locations of utilities and other features encountered, modifications to proposed grades and site features, and other deviations from the original design are installed differently from that shown, indicate differences clearly and neatly using ink or indelible pencil.
4. At project completion, submit record set of drawings (Refer to Section 01 70 00 if applicable).

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. Acceptable Manufacturers:
  1. Individual items:
    - a. Base: As noted
    - b. Optional: As noted
- B. Use only prime quality, new materials, apparatus and equipment.

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- A. Use only thorough, highly skilled, and experienced workmen.
  1. Divisions: 31, 32, and 33 grading and utilities shall be installed in a neat and workmanlike manner.
- B. When changes in location of any work are required, obtain approval of the Engineer before making change.
  1. Make changes at no extra cost.
- C. Do not change indicated sizes without written approval of Engineer.

### **3.02 CUTTING AND PATCHING**

- A. Perform or pay for all cutting, fitting, repairing, patching and finishing of work of other sections where it is necessary to disturb such work to permit installation of civil elements.
  1. Repair or replace existing or new work disturbed.

### **3.03 INSTALLATION OF UTILITIES**

- A. Install all utilities in accord with manufacturer's recommendations.

### **3.04 FIELD QUALITY CONTROL**

- A. Perform indicated tests to demonstrate workmanship, operation, and performance.
  1. Conduct tests in presence of Architect and, if required inspectors or agencies having jurisdiction.
  2. Arrange date of tests in advance with Architect, manufacturer and installer.
  3. Give all inspectors minimum of 24 hour notice.
- B. Repair or replace equipment and systems found inoperative or defective and retest.
  1. If equipment or system fails retest, replace it with products conforming with Contract Documents.
  2. Continue remedial measures and retests until satisfactory results are obtained.
- C. Test equipment and systems as indicated for each item, unless otherwise recommended by manufacturer.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**



## SECTION 31 05 00

### COMMON WORK RESULTS FOR EARTHWORK (OUTSIDE BUILDING FOOTPRINT)

#### **PART 1 - GENERAL**

##### **1.01 SCOPE**

- A. Work Included: Furnish all labor, equipment and materials to complete all earthwork including:
1. Site clearing, grubbing, stripping, and earth moving.
  2. Excavation, filling, backfilling, compaction and grading.
  3. Preparation of subgrade for slabs on grade, walks, pavements, roads and parking areas.
  4. Proofrolling of Subgrade.
  5. Furnish, apply and rough grade topsoil.
  6. Removal of structures at or below grade.
  7. Provide and pay for all necessary permits.
  8. Shoring, cribbing and bracing to safely support excavations.
  9. Contractor shall determine if the site "balances" and include in their bid any import or export of material including any spoils from utilities.
- B. Work Not Included:
1. Excavating and backfilling inside and outside of building as required for plumbing, heating and electric work installed underground, including tanks, pits, manholes, catch basins and inlets, which are included in other Sections.
- C. Summary of Specification Sections:

#### PART 1 - GENERAL

Scope  
Reference Standards  
Quality Assurance  
Submittals  
Quantities

#### PART 2 - MATERIALS

Fill Materials  
Topsoil

#### PART 3 - EXECUTION

General  
Protection  
Existing Utilities  
Site Clearing and Grubbing  
Site Grading  
Cut and Fill  
Excavating  
Geotextile Fabric  
Backfill and Fill  
Compaction  
Final Grading  
Maintenance  
Disposal of Excess and Waste Materials  
Unanticipated Subsurface Conditions

##### **1.02 REFERENCE STANDARDS (LATEST EDITION)**

- A. ASTM A444 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process for Culverts and Underdrains
- B. ASTM C136 - Sieve Analysis of Fine and Coarse Aggregates
- C. ASTM C207 - Hydrated Lime for Masonry Purposes

- D. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method
- E. ASTM D422 - Particle Size Analysis of Soils
- F. ASTM D423 - Liquid Limit of Soils
- G. ASTM D424 - Plastic Limit and Plasticity Index of Soils
- H. ASTM D698 - Moisture-Density Relations of Soils and Soil-Aggregate. Mixtures using 5.5 lb. Rammer and 12 inch Drop (Standard Proctor Test)
- I. ASTM D1452 - Soil Investigation and Sampling by Auger Borings
- J. ASTM D1557 - Moisture Density Relations of Soils and Soil- Aggregate Mixtures using a 10 lb. Rammer and 18 inch Drop (Modified Proctor Test)
- K. ASTM D2167 - Density of Soil in Place by the Rubber-Balloon Method
- L. ASTM D2487 – Classification of Soils for Engineering Purposes
- M. ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregates in Place by Nuclear Methods (Shallow Depth).
- N. Standard Specification for Highway and Structure Construction, State of Wisconsin.

### **1.03 QUALITY ASSURANCE**

- A. Perform earthwork in compliance with local, state and OSHA requirements.
- B. Project Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of the geotechnical engineer and represent interpretations of the subsoil conditions, tests, and results of analyses conducted by the geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from this data by Contractor.
  - 1. Contractor shall make additional test borings and conduct other exploratory operations as necessary.
  - 2. The geotechnical report is included in the Existing Conditions section of the Project Manual.
- C. Testing and Inspection Service: Construction Manager shall engage soil testing and inspection service (Geotechnical Engineer) for quality control testing during earthwork operations.
  - 1. Additional copies of testing reports shall be sent to the architect.
  - 2. Testing agency representatives on the site are required to read and understand the requirements of the Construction Documents, the Soil Report and this Section. Contractor shall verify this condition.
  - 3. Approval of Fill Materials: Fifty (50) pound representative samples of each type of proposed fill material required shall be submitted by Contractor to the testing laboratory for analysis and optimum moisture and maximum density determinations. The cost of all retesting because of unacceptable proposed fill material or change in source of fill material shall be borne by Contractor by means of a credit with a Contract Change Order. Approval by the laboratory must be given prior to the start of any fill placement.
    - a. Approval of material based on laboratory tests may not guarantee compaction acceptability of material on site, given time of year and climatic conditions. Contractor shall substitute materials as required and as approved by Geotechnical Engineer to achieve specified requirements on the site.
  - 4. Proofrolling, undercutting, and fill operations shall be performed under the observation of the Geotechnical Engineer.
  - 5. Field density tests for determining the compaction of existing soils and fill will be made frequently during the progress of the work in accordance with standard recognized procedures for making such tests.

- a. At a minimum, perform at least one test for the top of existing soils and each lift of fill material placed, and at least one test for each 2500 square feet of area per lift, but in no case fewer than 3 tests. Take at least one compaction test for each lift for every 25 feet for wall footings, and 50 feet for utility trenches. Perform one to four tests for each column footing, depending on footing size.
  - b. All required testing will be performed by the testing laboratory. Contractor shall cooperate as required in the making of these field tests.
  - c. Perform a passing retest at each prior failing test area. The costs of any retesting required because of the failure of compacted areas to meet specification requirements shall be borne by Contractor by means of a credit with a Contract Change Order.
- 6. Approval by Geotechnical Engineer must be given prior to the placing of any concrete or fill material, and whenever the Soil Report or actual conditions encountered indicate loose or variable soil conditions, variable soil coloration, unexpected materials, etc. Do not proceed if unsuitable conditions are encountered. Notify Geotechnical Engineer immediately.
- 7. Testing agency shall provide to Owner, Architect and Engineer written field reports that topsoil and unacceptable soils have been removed, reports of actual bearing pressures encountered, and all compaction tests. Provide written verification that existing soils and fill materials achieve specified bearing capacity at all locations including lawn and unpaved areas.
- 8. Provide Geotextile Fabric Information to Geotechnical Engineer for review.
- 9. Review and approval by Geotechnical Engineer is required for anti-seep collars and concrete or clay cut-off walls.
- D. Grading Limits: Confine work to the Construction Limits as indicated on the drawings. In the absence of such a designation on the drawings, confine work to the minimum area reasonably necessary to undertake the work as determined by the Engineer. All areas disturbed by excavation and grading, plus such additional areas as are disturbed by construction related activities including construction access and storage and installation of materials shall be considered the "Construction Area."
- E. Wherever provisions of the Specification, Drawings, including supplements and addenda, or the requirements of Geotechnical Engineer conflict (e.g. compaction materials, required percent compaction, etc.), the more stringent requirements shall govern unless approved in writing by Engineer.
- F. Conform to Federal, State and local ordinances with respect to excavations, disposal of waste, burning, air quality, noise, erosion, water runoff, etc.
- G. Record Drawings: Maintain record drawings of all underground utilities, drain tiles, or other structures encountered, and/or earthwork made as part of this project on original drawings prepared by the installing Contractor/ Subcontractor.
- H. Earth Retention System: Contractor is completely responsible for the design and construction of adequate and safe temporary shoring, bracing, retaining structures and excavations. All systems shall be designed for potential sand seams and water, which may cause caveins, and/or require additional bracing, casing of bore holes, dewatering, etc.

#### **1.04 SUBMITTALS**

- A. Submit shop drawings or material mixes for the following earthwork features (outside the building footprint) as indicated in section 31 00 05 Civil General Requirements:
  - 1. Fill materials (sample to be tested and approved by geotech)
  - 2. Engineered soil mix (for Bio-Filtration areas)
  - 3. Bio-filter example and reference list (as required in 3.07)
  - 4. Clay liner in ponds (if required)
  - 5. Geofabric (sample to be tested and approved by geotech)

#### **1.05 QUANTITIES**

- A. Elevations provided on the plans are finished elevations including topsoil. Finish topsoil depth shall be as specified in this section or as shown on the drawings, whichever is greater.
- B. Contractor shall be solely responsible for determining all earthwork quantities based on the existing and proposed elevations provided on the plans. Any geotechnical investigations provided by the Owner apply only to those locations that the data was collected, and may not be indicative of conditions elsewhere on the site. The Contractor is responsible for collecting any additional geotechnical or survey data he deems necessary to complete an accurate estimate of earthwork quantities.
- C. Contractor shall be solely responsible for balancing site materials. If onsite excavation and borrow operations do not provide enough suitable material for fill areas, Contractor shall coordinate and pay for excavation, transport and placement of imported material meeting the specifications of the contract documents. If excavation results in excess materials, Contractor shall coordinate and remove all excess materials from the site (at no cost to the owner). Prior to Bidding the Contractor to coordinate with the owner to locate on-site locations for excess material. It shall not be assumed that excess materials can remain on site.
- D. If contractor finds the geotechnical information or existing or proposed elevations shown on the plans to be erroneous, he shall notify the Project Manager immediately.

## **PART 2 - MATERIALS**

### **2.01 FILL MATERIALS**

- A. Structural Fill: Well graded, granular material, bankrun sand and gravel, or crushed or natural stone, free of shale, clay, friable materials and debris; tested in accordance with ANSI/ASTM C136 within the following limits:
  - 1. Maximum size of aggregate shall be 2" with not more than 80% passing on a 3/4 inch sieve, with not less than 50% by weight passing a No. 4 sieve.
  - 2. Not more than 15% shall pass the No. 200 sieve.
  - 3. When used for bedding under pipes, conduits or culverts, fill shall consist of material with greater than 50% by weight passing a No. 4 sieve and all particles passing a 1 inch sieve. Bedding material shall be selected and placed in accordance with the recommendations of the pipe manufacturers, and in accordance with Chapter 6.43 of *Standard Specifications for Sewer and Water Construction in Wisconsin, Latest Edition*.
    - a. Fill above utilities shall be clay where existing soils are clay.
    - b. For all utilities and other excavations, provide anti-seep, concrete collars or cut-off walls, or other suitable means to cut off water where a water source could flow back to building.
  - 4. Structural Fill shall achieve the required soil bearing pressure specified in the Contract Documents and Soil Report.
- B. Fill placed in fabric or geogrid reinforced sub-grade areas in pavement areas shall be granular soil, such as 1-1/4 inch or 3/4 inch crushed stone aggregate, or other as recommended by the geotechnical engineer. Aggregate should not exceed the maximum recommended by the geotextile manufacturer.
- C. For site material beyond six feet of perimeter walls, except for backfill against basement and retaining walls, other materials may be used as structural fill subject to Geotechnical Engineer's recommendation, review and approval and Structural Engineer's review and approval. Material shall achieve specified minimum net soil bearing capacity and compaction requirements. Geotechnical Engineer shall review the following:
  - 1. Material description per the Unified Soil Classification System, liquid and plastic limits. Clay soils shall be low-expansive with a Liquid Limit less than 45% and a Plasticity Index greater than 11% and less than 22%.
  - 2. Gradation percentages.
  - 3. Requirements for preparation of material.

4. Requirements for methods of compaction, including equipment.
  5. Information regarding frost resistance and expansion characteristics compared to structural fill specified.
  6. Unsatisfactory Soils: ASTM D2487 soil classification groups ML, MH, CH, OL, OH, and PT or a combination of these group symbols, and satisfactory soils not maintained within specified percent of optimum moisture content at time of compaction.
- D. Drainage Fill: Frost resistant, well graded, clean, angular/fractured, crushed stone or gravel (not sand), free of silt, clay, loam, friable or soluble materials, and organic matter; tested in accordance with ANSI/ASTM C136 within the following limits:
1. Not more than 5% shall pass the No. 200 sieve.
    - a. Slab on grade subgrade: ASTM C33, Size 67.
    - b. Building perimeter drain lines shall be surrounded with at least 12 inches of washed aggregate conforming to ASTM C33, Size 67.
    - c. Perimeter drains at retaining walls shall be surrounded with at least 12 inches of washed aggregate conforming to ASTM C33, Size 67.
- E. ASTM Stone: Angular crushed limestone aggregate meeting the gradation requirements of ASTM D448.
1. No. 2 Stone: Double washed crushed stone, meeting the gradation requirements of No 2 stone per ASTM D448.
  2. No. 8 Stone: Double washed crushed stone, meeting the gradation requirements of No 8 stone per ASTM D448.
  3. No. 57 Stone: Double washed crushed stone, meeting the gradation requirements of No 57 stone per ASTM D448.
- F. Lean Concrete: Minimum 1,500 psi compressive strength at 28 days.
- G. Common Fill: Approved material from site, excavation or off- site, separated from materials which do not compact by tamping or rolling. Crushed stone, bank run gravel, or coarse sand or general earth material free of particles larger than 6 inches, debris, peat, roots, cinders, wood, trash, organic material or other objectionable material.
- H. Clay liner for ponds:
1. For areas where the in-situ soils are not suitable as a liner (per a geotechnical representative), the contractor shall install a clay liner per the details with the following properties:
    - a. Average Plasticity and liquid limit:
      - pi > 12 with no values less than 10
      - II ≥ 25 with no values less than 20
      - moisture content = 0-2% above optimum
    - b. Place liner in 9" lifts, compact to 90% modified proctor
    - c. An in place hydraulic conductivity of  $1 \times 10^{-7}$  cm/sec or less
    - d. 50% fines (200 sieve) or more
- I. No organic, deleterious or frozen or "contaminated" material may be used for backfilling or fill material.
- J. Geotextile Material: Conforming to WISDOT 645 and Soil Report with respect to Grab, Puncture and Burst Strength, Trapezoidal Tear, Permativity, and Apparent Opening Size.
1. Around stone surrounding daintile and trench drains: WISDOT 645.2.4 Type DF, Type A or better:
    - a. "Mirafi 140-N"
    - b. "ADS 5000"
    - c. "Amoco 4547"
    - d. "Contech C-45NW"
    - e. Approved equal
  2. Under slab-on-grade when specified on plans as required: WISDOT 645.2.2 Type SAS:
    - a. "Mirafi 180-N"
    - b. "Mirafi FW404"
    - c. "ADS 8800"

- d. "Amoco 4553"
- e. "Contech C-80NW"
- f. "Terra Tex-N08"
- g. Approved equal
- 3. Soil stabilization and subgrade reinforcement above poor soils: WISDOT 645.2.3 Type MS:
  - a. "Tensar BX-1200"
  - b. Approved equal

## **2.02 TOPSOIL**

- A. Existing topsoil on site will be stripped and stored by this Contractor.
  - 1. Topsoil remaining after all work is completed shall be disposed of by Contractor at no cost to Owner.
- B. Topsoil to be Furnished: If quantity of stored topsoil is inadequate or if none has been salvaged from site, this Contractor shall furnish sufficient topsoil to properly construct planting areas. Topsoil furnished shall be a natural, fertile, friable soil, possessing characteristics of representative productive soils in the vicinity. It shall be obtained from naturally, well-drained areas. It shall not be excessively acid or alkaline or contain toxic substances which may be harmful to plant growth. Topsoil shall be without admixtures of stones, stumps, roots, debris or other objects 1" or more in diameter which might be a hindrance to planting operations. Topsoil shall be placed to a minimum depth of 6" after compaction, or as specified on the landscape plans (whichever is greater).
- C. Earthwork contractor shall spread topsoil; fine grading of topsoil will be by Landscape Contractor.

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- A. Contractor to review specific method of soil preparation as listed in the geotechnical report.
- B. Contractor is to establish all heights and grades to properly execute work from benchmark established by others (from original survey work). It is strongly recommended that the original surveyor be contacted and used for all construction layout as well as as-built surveys in an effort to avoid conflict between datums and horizontal control points used. Prior to construction layout, existing and proposed finished floor elevations shall be checked with respect to current site benchmarks to ensure elevations correspond with layout elevations.
- C. Contractor shall provide all construction layout surveys to accurately locate the construction on the site.
- D. Prior to start of work, Contractor shall be completely familiar with all conditions at the site, and shall account for conditions that may affect the work including: Geotechnical recommendations and methods, limitations on work access, space limitations, overhead obstructions, traffic patterns, local requirements, adjacent activities, etc. Failure to consider these requirements shall not be cause for claim of job extras.
- E. Inspect areas and conditions prior to clearing, excavating, filling, and grading. Do not proceed until unsatisfactory conditions have been corrected.
- F. Permits and Fees:
  - 1. Apply for, pay for and secure all permits required in connection with the work under this section from the governmental authorities having jurisdiction.
  - 2. Pay all highway and dumping fees and repair damage to sidewalks, streets, or other public property, or to any public utilities.

### **3.02 PROTECTION**

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by

settlement, lateral movement, undermining, washout and other hazards created by earthwork and dewatering operations. Protect and maintain all lawns, beds, shrubs, trees, and other work that is to remain in place.

1. Should damage occur as a result of work performed under this Contract, restore to existing condition at no additional cost to Owner, in a manner acceptable to Architect.
  2. Repair or replace trees and vegetation indicated to remain which are damaged by construction operations, in manner acceptable to Architect.
- B. Conduct site clearing operations to ensure minimum interference with roads, streets, walks and other adjacent occupied or used facilities. Do not close or obstruct roads or other occupied or used facilities without permission from Owner and authorities having jurisdiction.
- C. Carefully remove items indicated to be salvaged, and store on Owner's premises where indicated or directed.
- D. Provide and maintain temporary fences, planking, lights, warning signs, barricades and guards necessary for protection of premises and public.
- E. Maintain cut at satisfactory slope which will prevent collapse of embankments. Provide bracing and shoring as required to protect existing improvements, including outside contract limits, new construction or excavations. Contractor is solely responsible for strength and adequacy of bracing or shoring and for safety. Conform to OSHA requirements. Restore any damaged improvements to their original condition.
- F. Do not load vehicles hauling debris excessively as to cause spillage on to streets and roadways. Do not allow spilled materials to clog drainage of streets.
- G. Keep sidewalks and streets adjoining the property broom clean and free of debris, excavated materials, rubbish, trash and obstructions, which might affect the safety of streets, walks, utilities and property. Broom clean daily.
- H. Use all means necessary to control dust on and near the work, if such dust is caused by the Contractor's operations during performance of the work, or if resulting from the condition in which the Contractor leaves the site.
- I. Provide positive protection (mat/sheet coverings) for all excavation slopes to protect slopes from instability and deterioration due to rain, wind or snow/ice.
- J. Construct, maintain and protect erosion and sedimentation controls.

### **3.03 EXISTING UTILITIES**

- A. The Contract Drawings show such information as can reasonably be obtained regarding the location and nature of pipe lines, storm sewers, water lines, natural gas lines, underground cables, etc. However, the accuracy or completeness of such information is not guaranteed. It shall be Contractor's responsibility to locate such underground features sufficiently in advance of operations to preclude damage to same.
- B. Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.
- C. Should uncharted or incorrectly charted, piping or other utilities be encountered during excavation, consult Architect and appropriate utility company immediately for directions. Cooperate with Owner and utility companies for keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility company. The cost of repair of uncharted or incorrectly charted utilities will be paid on the basis of Changes In The Work defined in the Conditions of the Contract.
- D. Do not interrupt existing utilities serving facilities occupied and used by Owner or others except when permitted in writing by Architect and then only after acceptable temporary utility services have been provided. Provide minimum of 48-hour notice to Owner, and receive written notice to proceed before interrupting any utility.

- E. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of service if lines are active.

### **3.04 SITE CLEARING AND GRUBBING**

- A. Clear area within contract limits of trees, stumps, brush, shrubs, vegetation, rubbish, and other perishable or objectionable matter (as indicated on the demolition and landscaping plan).
  - 1. Remove all cleared material from site.
  - 2. An effort has been made to show the majority of existing trees on-site on the plans, however, Contractor to visually verify removal limits prior to bidding. All tree removals shall be field marked and verified with the owner, prior to removal.
  - 3. Existing bituminous and concrete paving, roads, walks, and curbs shown in areas of proposed improvements or reused grades, shall be removed by this Contractor to a depth of at least 10" below the paved surface.
  - 4. Completely remove stumps, roots, and other debris protruding through ground surface. Use only hand methods for grubbing inside drip line of trees indicated to remain.
  - 5. Remove existing above-grade and below-grade improvements, unsuitable fill, cinders, concrete, old foundations and any other unsuitable material as indicated on Drawings, soil report or interfering with new construction.
  - 6. Burying or burning of materials on the site is not permitted.
  - 7. Trim limbs and branches of trees to be left in place which overhang roadbeds or structure to provide proper clearance.

### **3.05 SITE GRADING**

- A. Topsoil:
  - 1. Strip all topsoil to the full depth of all organic material.
  - 2. Remove heavy growths of grass from areas before stripping.
  - 3. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root system.
  - 4. Stockpile topsoil on site in storage piles (location to be agreed to by Owner) in areas indicated or directed. Construct storage piles to provide free drainage on site of surface water. Stabilize top soil pile.
  - 5. Dispose of unsuitable or excess topsoil same as specified for disposal of waste material.
- B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- C. Preparation of subgrades after stripping vegetation, organic or other unsuitable materials shall consist of:
  - 1. Proof-rolling under the observation of an experienced Geotechnical Engineer or Technician to detect soft, wet, yielding soils or other unstable materials. Proof rolling shall consist of rolling the subgrade with a heavily loaded rubber tired vehicle such as a loaded scraper or tandem axle dump truck. Any areas requiring undercutting shall be measured, marked in the field and documented by the geotechnical engineer. The contractor will be paid only for approved and documented undercut areas in accordance with the required unit price and allowance as outlined on the bid form.
    - a. Should undercutting be required, undercut as outlined below only after contract extra has been approved.
      - 1) Undercut soft or unsuitable areas of subgrade 2 feet or as directed by Geotechnical Engineer. Backfill with granular soil (as indicated in the geotechnical report) fill in maximum 8 inch loose lifts, and compact to the minimum required degree of compaction as specified in Compaction Section.
      - 2) Remove the top 18" of the subgrade where expansive clays (Liquid Limit greater than 50) are encountered. Replace with granular structural fill.
      - 3) Remove, as directed by Geotechnical Engineer, underlying bearing soils that are disturbed by construction, weather or earthwork activities, and replace with structural, engineered fill.



- 4) In pavement areas, backfill half of undercut with No. 2 stone placed in 8" lifts and compacted until no further vertical and lateral movement is observed. Backfill upper half of undercut with Base Coarse Aggregate placed in 8" lifts and compacted as specified in Compaction Section.
  - 5) Provide Geotextile Fabric before backfilling, if soft soils exist at bottom of excavation.
2. Scarify top 6 to 8 inches.
  3. Moisture condition soils as required.
  4. Recomposition to same minimum in-situ density required for similar materials.
  5. Stone Base course shall be proof-rolled prior to placing pavement section as well.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.
- E. All subgrades shall consist of and be:
1. Underlain by suitable bearing material.
  2. Free of all organic, frozen or other deleterious material.
  3. Observed, tested and approved by Geotechnical Engineer.

### 3.06 CUT AND FILL

- A. Provide all necessary cutting and filling required to change existing grade specified or as shown on drawings.
1. Note: A vibratory smooth drum roller should not be used on clay soils.
  2. In areas under proposed pavement, consult with geotechnical engineer and report for construction methods.
  3. Rough grade all seeded areas to 6" below finish grade elevation. Where topsoil of sufficient depth is encountered, grade shall be brought to final established grade. Minimum depth of topsoil shall be 6".
  4. All roads, drives, and parking areas etc. shall be rough graded to 15" below finish grade, or as required to install subgrade and finish pavement.
- B. Fill in excess of 12" shall be constructed in 8" layers and shall be rolled with rubber tired equipment or sheepsfoot rollers, or compacted with vibratory equipment, whichever is best suited for soil being compacted.
1. Fill under paved areas shall be compacted to 95 percent Modified Proctor, as per ASTM D 1557.
- C. Where there is a great change in grade, a maximum slope of three to one (3:1) shall be maintained. Reference Section 31 25 00 - Erosion Control for specific requirements.
- D. Do no grading until sewers, water mains and other utilities are installed. After backfill has settled and when directed, fill shallow places to bring to proper grade.
- E. Excess excavated material from trenches and other excavations will be piled on site if to be reused, or removed from site by respective Contractors. Deposition and spreading shall be done by this Contractor. Fine grading will be by landscape contractor.
1. 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.
  2. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
- F. In the Bio-Infiltration Areas:
1. The subgrade of the bio-infiltration areas shall be loosened/tilled to promote infiltration.
  2. Engineered soil and stone shall be placed on the non-compacted excavated area.
  3. Engineered soil shall be installed in maximum lifts of 12". Each lift shall be gently watered to promote slight settling.
- G. The Contractor shall have experience in installing at least 5 successful bio-filters. The Contractor shall demonstrate the prerequisite experience and knowledge by providing a minimum of 5

successful examples of projects having similar size and scope, as well as project reference, unless waived by the Owner.

### 3.07 EXCAVATING

- A. Excavate and remove whatever materials encountered, including existing pavements, abandoned building foundation walls, footings and slabs, and unsuitable fill as required to place within finish elevations shown, all footings, walls, trenches, pits, ground floor slabs, drain tiles inside and around basement to complete the project.
  - 1. Remove rock to lines and grades indicated, to permit installation of permanent construction without exceeding the following dimensions:
    - a. 12 inches outside of concrete forms at footings.
    - b. 6 inches outside of minimum required dimensions of concrete cast against grade.
    - c. 6 inches beneath bottom of concrete slabs on grade.
- B. Maintain pit or pits to which all excavated parts shall be drained. Provide, operate and maintain suction and discharge lines, pumps and other equipment necessary to drain and keep all excavations, trenches and entire subgrade area free of water under any and all circumstances which may arise.
  - 1. Notify Geotechnical Engineer if springs or water seepage is encountered during grading for possible construction procedure revisions or inclusion of subgrade drainage system.
- C. Excavated earth shall remain on site, if possible, and placed where directed.
  - 1. After final grading work is complete, remove any excess earth from premises. Where site constraints dictate, excavated earth shall be stored off-site or landfilled.
  - 2. All surplus earth shall be removed from premises.
- D. Additional Excavation:
  - 1. When excavation has reached required subgrade elevation, notify Architect and Geotechnical Engineer for inspection of conditions.
- E. Unauthorized Excavation: Consists of removal of materials beyond indicated subgrade elevations, limits or dimension without specific direction of Geotechnical Engineer. Unauthorized excavation, as well as remedial work directed by Architect and/or Geotechnical Engineer, shall be at Contractor's expense.
- F. Frost Protection: All open footings, trenches and exposed floor slab areas must be protected against frost impregnation.
- G. Stability of Excavations:
  - 1. Slope sides or excavations to comply with governing codes and ordinances, including OSHA Subpart P of 29 CFR 1926, or successor regulations. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
    - a. Unless required otherwise by code or unless authorized by Geotechnical Engineer, slopes for excavations 20 feet deep or less should not exceed 1:1 for soil Types A and B and 1-1/2 (horizontal):1 (vertical) for soil, Type C.
  - 2. Maintain side and slopes of excavations in a safe condition until completion of backfilling.
- H. Do not place excavated materials where they will inconvenience the public, impede travel, or impede surface drainage unless such drainage is being safely rerouted away from the excavation without causing other damage. Do not place excavated materials close to a trench or excavation, unless shoring of adequate strength is provided to support the additional loads that are imposed.
- I. Tunnel under, or remove and replace, sidewalk and curb in areas of excavation to the nearest joint. Remove all pavements, including curbs and gutters, to neat and straight lines to the limits of removal by a two-step method. Limit the initial removal to the immediate area of the proposed work. Full depth sawcutting is not required for this phase of the removal. After the work is completed, and immediately prior to the pavement replacement, make a full depth sawcut to neat and straight lines outside the widest point of excavation. Make the lines of sawcut parallel to existing joints, or parallel or perpendicular to pavement edges so as to form a neat patch. Carefully remove all remaining pavement within the sawcut area to the lines of the sawcut. Do not disturb existing base materials

between the area disturbed by the work and the sawcut line during the sawcutting, pavement removal, or pavement replacement processes.

- J. If field tile are encountered during the excavation, the Contractor shall make provisions for continuing the drainage on an interim basis and immediately notify the Architect and Geotechnical Engineer. Field tiles shall be re-routed wherever possible.

### **3.08 GEOTEXTILE FABRIC**

- A. Install in accordance with WISDOT 645, Soil Report and Manufacturer's Specification and Requirements with a minimum overlap of two (2) feet.
  - 1. Provide around drain tile, wherever shown on drawings and/or recommended/specified in the Soil Report.
  - 2. Where piping vertically intersects the Geotextile Fabric, run fabric up pipe and tape prior to backfilling.
  - 3. Where horizontal piping is installed after and below the Geotextile,
    - a. Cut the Geotextile in a line centered on the pipe excavation and fold back.
    - b. After pipe installation, backfill to the bottom of the Geotextile, fold the fabric back, and tape the joint.
    - c. Tape a 4 foot wide strip of Geotextile, centered over the cut joint.
- B. Geotechnical Engineer shall review and approve installation and provide written report to Architect/Engineer.

### **3.09 BACKFILL AND FILL**

- A. General: Place acceptable tested and approved soil material in layers to required subgrade elevations, for each area classification listed below.
  - 1. Structural/Engineered Fill:
    - a. Use as fill or backfill in excavations against walls (except as noted in Item 2), under walks, steps and pavements and under interior building slabs, except as noted in Item 3 below.
    - b. Use as bearing material below footings and above natural occurring bearing soil where unsuitable material has been removed.
    - c. Amount or width of structural fill against walls shall be per this specification, as shown on drawings, or as directed by Geotechnical Engineer. The more stringent requirement shall be used.
  - 2. Drainage Fill:
    - a. Use as final 6" minimum layer (or greater as shown on Contract Documents or Soil Report) for granular sub-beds under all exterior floor slabs resting on earth and exterior sidewalks, and steps.
    - b. Use around all drain tile, piping, etc. prior to backfilling with structural fill.
  - 3. Exterior Pavement Sub-beds: Use as final 6" minimum layer (or greater as specified on the plans, in Section 32 11 23.33 - Dense Graded Base or Soil Report) for granular crushed stone sub-bed under exterior drives, parking areas, and ramps. See Soil Report for pavement design requirements.
  - 4. Common Fill: Use under unpaved exterior areas.
  - 5. Engineered Soil: Use in Bio-Infiltration areas as indicated on plans.
- B. Prior to Backfill Placement: Backfill excavations as promptly as work permits but not until completion of the following:
  - 1. Acceptance by Geotechnical Engineer of construction below finish grade.
  - 2. Inspection, testing and approval of underground utilities and systems.
  - 3. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.
  - 4. Surveying locations of underground utilities for Record Documents.
  - 5. Removal of mud, water, caved-in, softened or disturbed soil, or frozen soil as directed by Geotechnical Engineer.

5. Removal of trash and debris.
  6. When existing ground surface has a density less than that specified under "Compaction" for the particular area classification, break up the ground surface, pulverize, moisture-condition to the optimum moisture content, and compact to required percentage of maximum density.
- C. Placement and Compaction:
1. Place backfill and fill materials in layers not more than 8" in loose depth for material compacted by heavy compaction equipment, and not more than 4" in loose depth for material compacted by hand-operated tampers. Equipment shall be compatible with type of soil to be compacted.
  2. Place backfill and fill materials evenly adjacent to structures, to required elevations. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around structure to approximately same elevation in each lift. Lifts should be placed horizontally and in uniform thicknesses.
  3. Extend fill a lateral distance of at least 1 foot for each foot of new fill required, with a minimum of six feet (6') beyond the edge of buildings and foundations. Against walls, free-draining granular structural backfill should extend a lateral distance of at least 4 feet from the outside face of the wall.
  4. Notify, coordinate and cooperate with Testing Agency regarding placement of fill. Each layer must be approved before the next layer is started.

### 3.10 COMPACTION

- A. General: Control soil compaction during construction, providing minimum percentage of density specified for each area classification.
- B. It is the responsibility of the Contractor to provide all necessary compaction equipment and other grading equipment that may be required to obtain the specified compaction. Compaction of controlled backfill by travel of grading equipment will not be considered adequate for uniform compaction. Hand guided vibratory or tamping compactors will be required whenever controlled backfill may be placed adjacent to walls, footings, columns or in confined areas.
- C. Percentage of Maximum Density Requirements:
1. Compact soil to not less than the following percentages of maximum dry density determined in accordance with ASTM D1557, Modified Proctor Test. For clay soils, use ASTM D698 Standard Proctor methods and add 3% to percentages specified below, not to exceed 100%.
  2. Foundations Fill: For fills less than or equal to 8 feet thick, compact the top 12" of existing soils and each layer of backfill or fill material to 95% maximum dry density. For fills greater than 8 feet thick, compact to 100% maximum dry density.
  3. Against basement walls, retaining walls and other walls with unbalanced soil pressures: 90% maximum dry density, except the top 5 feet below a driveway or loading dock shall be 95%. If crushed stone backfill is used, stone shall be nested firmly as it is placed with additional compaction as required. Expected settlements shall be less than or equal to other structural fill performance.
  4. Lawn or Unpaved Areas: Compact the top 6" of existing soils and each layer of backfill or fill material to 88% maximum dry density, except future expansion areas shall be 95% maximum dry density.
  5. Sidewalks: Compact the top 6" of existing soils and each layer of backfill or fill material to 95% maximum dry density.
  6. Pavements: Compact the top 12" of existing soils and each layer of backfill or fill material to 95% maximum dry density or until additional passes over the crushed stone produce visually no additional compaction.
  7. Utility trench backfill should be compacted to at least 90% of the Modified Proctor (ASTM D1557) maximum dry density from 1 foot above the top of the pipe or conduit up to final surface grade to minimize subsidence. Under structures and pavements, compaction should be at least 95%. Trench backfill should be placed in lifts of 12 inches or less. Placement shall conform to Standard Specifications for Sewer and Water Construction in Wisconsin.
  8. No compaction should be completed in bio-infiltration areas.

- D. Moisture Control:
1. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material. Scarify or disk as required to distribute water uniformly through soil. Apply water in manner to prevent free water appearing on surface during or subsequent to compaction operations. The moisture content of the soil should be within -1.0% to +2.5% for cohesive soils, -3% to +3% for cohesionless soils, of the optimum moisture content as determined by ANSI/ASTM D1557.
  2. Remove and replace, or scarify by repeatedly plowing and discing during favorable weather conditions to air dry, soil material that is too wet to permit compaction to specified density.
  3. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to a satisfactory value.
  4. Clay soil bearing capacity and compaction levels are highly affected by water and construction activities.
    - a. Clay soils may require continued moisture control, modification with Portland Cement or hydrated lime, and/or per Maintenance Section of this specification until drainage subgrade and slab on grade are installed.

### 3.11 FINAL GRADING

- A. General: Uniformly grade area within limits of grading under this section, including adjacent transition areas. Smooth finished surface, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades. If fill is to be placed and compacted at the edge of a slope steeper than 4H:1V, overfill a minimum of 2 feet laterally beyond the final grade and trim back to design slope after achieving required degree of compaction.
- B. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes.
1. All contours and/or spot elevations shown on Drawings are to finish grade, unless otherwise noted (i.e. top of pavement, topsoil, etc.). Contractor shall be responsible for making excavations or embankments to the subgrade elevations necessary such that the addition of the pavement, topsoil or whatever surface improvement, will ensure that finished grades are met.
  2. Contours indicated on drawings are the finished grade elevations. Review all grade elevations before commencing work to insure that proper slopes for drainage, slopes for drives, walks, paving, etc., are maintained. If Contractor believes a deficiency is apparent, he shall notify the Architect for clarification and correction.
  3. Pavements:
    - a. Shape the surface of the areas under pavement to line, grade and cross-section, compacted as specified, and graded to prevent ponding of water after rains. Rough grade tolerance shall conform to +0 in./-1 1/2 in. Fine grading tolerance shall conform to +0 in./-3/4 in.
    - b. Include such operations as plowing, discing, and any moisture or aerating required to provide the optimum moisture content for compaction.
    - c. Fill low areas resulting from removal of unsatisfactory soil material, obstructions, and other deleterious materials, using structural fill material. Shape to line, grade, and cross-section as shown.
  4. Ditches: Finish ditches to ensure proper flow and drainage. Conduct final rolling operations to produce a hard, uniform and smooth cross-section.
- C. Grading Surface of Fill Under Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of +0 in./-3/4 in.
- D. Compaction: After grading, compact subgrade surfaces to the percentage of maximum density for each area classification.
- E. Preparation for Lawn Construction: Preparation of Subgrade: Grade and uniformly compact subgrade so that it will be parallel to proposed finished grade. Loosen subgrade materials and mix

to a depth of 8". Remove all stones over 1" in size and remove all sticks and rubbish. Do not move heavy objects, except lawn rollers, over lawn areas after the subgrade soil has been prepared unless subgrade soil is again graded and loosened, as specified above, before topsoil is spread.

### **3.12 MAINTENANCE**

- A. Protection of Graded Areas:
  - 1. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
  - 2. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- B. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape and compact to required density prior to further construction.
- C. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

### **3.13 DISPOSAL OF EXCESS AND WASTE MATERIALS**

- A. Removal from Owner's Property:
  - 1. Remove excess and waste materials, including excavated material, excess topsoil, trash and debris, and dispose of it off Owner's property.

### **3.14 UNANTICIPATED SUBSURFACE CONDITIONS**

- A. If Contractor encounters conditions that are different during earthwork, paving and foundation construction operations than those anticipated, this fact shall immediately (within 24 hours) be brought to Owner's attention. If Owner's representative on the construction site observes subsurface conditions which are different than those anticipated by the Soil Report, this fact shall immediately (within 24 hours) be brought to Contractor's attention. Once unanticipated conditions have been identified, and Consultant has concurred, immediate negotiations will be undertaken between Owner and Contractor to arrive at a change in contract price for additional work or reduction in work because of the unanticipated conditions. Contractor agrees that unit prices as stated in the Bid Form shall apply for additional or reduced work under the Contract.

END OF SECTION

## SECTION 31 23 16

### TRENCHING

#### **PART 1 - GENERAL**

##### **1.01 SCOPE**

- A. The work under this section shall consist of providing all work, materials, labor, equipment, and supervision necessary to complete trenching for utilities and other work, as required in these specifications, on the drawings and as otherwise deemed necessary to complete the work. Included are the following topics:

PART 1 - General

Scope  
Related Work  
Submittals  
Record Drawings  
Quality Assurance  
Permits/Fees  
Provisions for Future Work  
Survey and Staking

PART 2 - Materials

Crushed Stone Bedding  
Crushed Stone Screenings  
Bedding Sand  
Cement Slurry Grout

PART 3 - Execution

Preparation  
Connections to Existing Utilities  
Dewatering  
Excavation  
Bedding/Initial Cover  
Backfill and Compaction  
Restoration

##### **1.02 RELATED WORK**

- A. Applicable provisions of Division 01 shall govern all work under this section.

31 05 00	Common Work Results for Earthwork (Outside Building Footprint)
31 25 00	Erosion Control
33 05 00	Common Work Results for Utilities
33 11 00	Water Utility Distribution Piping
33 30 00	Sanitary Sewerage Utilities
33 40 00	Storm Drainage Utilities

##### **1.03 SUBMITTALS**

- A. Provide copies of record drawings.
- B. Provide samples of each type of soil or aggregate proposed for use on the project. Samples shall consist of a minimum of 50 pounds of soil. The contractor shall be responsible for delivering soil samples to the testing agency as designated by the Construction Manager. Provide samples a minimum of 2 weeks prior to starting construction.

##### **1.04 RECORD DRAWINGS**

- A. Refer to Section GR - General Requirements.

- B. Maintain record drawings that show the actual locations, sizes and types of utilities and other features encountered.

#### **1.05 QUALITY ASSURANCE**

- A. The Geotechnical Engineer shall refer to Section 31 05 00 Common Work Results for Earthwork (Outside the Building Footprint) for quality assurance testing.

#### **1.06 PERMIT/FEES**

- A. Contractor shall be solely responsible for obtaining all permits necessary to complete trenching work. The Contractor shall pay all fees associated with obtaining permits. These include, but are not limited to permits to work within right-of-way, utility connection permits, plumbing permits, electrical permits and other building permits.

#### **1.07 SURVEY AND STAKING**

- A. Surveyor will provide benchmarks and control points for the project.
- B. Contractor shall be responsible for transferring benchmarks, control points, lines and grades as necessary to complete his work.

### **PART 2 – MATERIALS**

#### **2.01 CRUSHED STONE BEDDING**

- A. Clean material meeting the requirements of “¾” Crushed Stone Chips” as defined in Section 6.43.2(a)2, regardless of pipe size, of Standard Specifications for Sewer and Water Construction.

#### **2.02 CRUSHED STONE SCREENINGS**

- A. Crushed stone free of organic material, concrete, asphalt and other debris. Material shall meet the requirements of “Crushed Stone Screenings” as defined in Section 6.43.2(b) of Standard Specifications for Sewer and Water Construction.

#### **2.03 BEDDING SAND**

- A. Sand meeting the requirements of “Bedding Sand” as defined in Section 8.43.2(c) of Standard Specifications for Sewer and Water Construction.

#### **2.04 CEMENT SLURRY GROUT**

- A. Portland cement based grout having a slump of 10”-12” and the following mix proportion (per CY):

1.	Type 1 Portland Cement	100#
2.	Class C Fly Ash	300#
3.	Fine Aggregate	2700#
4.	Water	400#
5.	Air Entraining Admixture	35 oz

- B. Similar mix designs that are suitable for the intended use will be considered.

### **PART 3 - EXECUTION**

#### **3.01 PREPARATION**

- A. Review plans and prepare work plan and schedule. Coordinate any necessary interruptions in utility service with Construction Representative, in accordance with other specification sections.
- B. Layout work. Establish and transfer line and grade as necessary to complete the work.



- C. Remove topsoil from work area. Saw cut and remove pavement from the work area.

### **3.02 CONNECTIONS TO EXISTING UTILITIES**

- A. Connect to existing utilities in accordance with the requirements of other pertinent specification sections.

### **3.03 DEWATERING**

- A. Dewatering shall be completed in accordance with Section 31 20 00 – Earthmoving and Section 31 23 19 – Dewatering.

### **3.04 EXCAVATION**

- A. Excavate to elevations and dimensions necessary to complete construction. Excavations shall be sufficiently deep to provide for bedding beneath pipes and structures.
- B. For pipes less than 12" in diameter, maximum trench width at the top of the pipe shall be 3'. For pipes greater than 12" in diameter, the maximum trench width at the top of the pipe shall be no greater than the outside diameter of the pipe plus 2'.
- C. The trench width at the ground surface shall be minimized to the extent possible through the use of trench boxes, shields, or shoring.
- D. The trench width at the ground surface shall not exceed the width of the trench at the top of the pipe by more than 2' without prior approval by the Construction Representative.
- E. Provide a minimum clearance of 6" from outside of pipe to the closest of either the sidewall of trench or inside wall of trench box, shield or shoring.
- F. Notify Construction Representative if trench subgrade consists of unstable soil, organic material, debris or other undesirable material.
- G. Segregate the various materials excavated. Reserve material meeting the requirements of backfill for the location. Excavated material that does not meet the requirements of backfill and excess excavated material, shall be removed from the site and disposed by the contractor, unless directed otherwise by other specification sections or the Construction Representative.
- H. Locate bedding, backfill and spoil piles in accordance with OSHA requirements, and so that it does not interfere with public travel, adjacent landowners or other construction activities.
- I. Trench excavation shall be limited to that which can be excavated and backfilled within the same workday.
- J. The same trench may obstruct no more than one street crossing at one time.

### **3.05 BEDDING/INITIAL COVER**

- A. Bed pipes and place initial cover material in accordance with detail drawings and the requirements of specifications for the utility and pipe type being installed.
- B. Establish excavation subgrade in accordance with proposed utility lines and grades, allowing for required amount of bedding material.
- C. Excavation shall be reasonably free of water prior to placement of bedding material.
- D. Place bedding material to required depth, and compact to 95% Modified Proctor dry density.
- E. Shape bedding material to conform to bell of pipe, fittings and structures.

- F. After placing pipe, support during placement and compaction of initial cover material. Place cover material in lifts having a maximum thickness of 6". Compact initial cover material to 95% Modified Proctor dry density.
- G. Compaction of initial cover material for pipe and fittings shall be accomplished using hand tools and vibratory plate or tamping type walk behind compactors.

### 3.06 BACKFILL AND COMPACTION

- A. Once initial cover material is placed and compacted, backfill trenches using the material specified on Table 31 23 16.13 - 2, or as shown on the drawings.
- B. Backfill trenches to elevations shown on the plans; allow for placement of base course, pavements, and topsoil as required by the plans and other Contract Documents. Where final restoration will be delayed, backfill the trench to existing grade to provide a safe, free-draining surface.
- C. Moisture condition backfill material as necessary to achieve density required for given use.
- D. Do not place material on frozen surfaces or use frozen material.
- E. Compact fill material as required by Table 31 23 16.13 - 2 for the given use.
- F. Compact material to minimize settlement and avoid damage to structures, pipes, utility lines and other features. Place backfill simultaneously on both sides of structures.
- G. It is the responsibility of the Contractor to provide all necessary compaction equipment and other grading equipment that may be required to obtain the specified density. Vibratory plate or tamping type walk behind compactors will be required whenever backfill is placed adjacent to structures, pipes, utility lines and other features.
- H. Flooding or jetting of backfill material for compaction purposes is not allowed.

Table 31 23 16.13 - 2				
Location	Required Material	Maximum Compacted Lift Thickness	Minimum Proctor Compaction	Minimum Relative Density <sup>(a)</sup>
Areas Beneath Footings, Floor Slabs, or Structures	Structural Fill	8"	95% Modified	70%
Footings, Foundation and Structure Backfill	Structural Fill	8"	95% Modified	70%
Areas within 10' of an Existing or Proposed Building or Structure Footing or Slab	Granular Fill	8"	90% Modified	60%
Areas Beneath Existing or Proposed Pavement (Roads, Drives, Walks)	Granular Fill	8"	95% Modified	60%
Turf Areas	Earth Fill	12"	85% Modified	50%

- (a) Minimum relative density as determined by ASTM D-4253-00 for coarse-grained soils with less than 15% by mass passing the No. 200 sieve. Applicable only when minimum proctor compaction cannot be achieved.

### 3.07 RESTORATION

- A. Restore trenches to proposed grades and surfaces as soon as practicable after backfilling.
- B. Remove excess bedding, backfill and spoil material from the site as soon as possible after backfilling is complete, but no later than 1 calendar dates after backfilling is complete.
- C. Thoroughly clean all drainage ways, roads, parking lots sidewalks and paved surfaces and remove and dispose all debris and mud.

END OF SECTION

## SECTION 31 23 19

### DEWATERING

#### **PART 1 - GENERAL**

##### **1.01 SCOPE**

- A. The work under this section shall consist of providing all work, materials, labor, equipment, and supervision necessary to provide for dewatering as required in these specifications, on the drawings and as otherwise deemed necessary to complete the work. Included are the following topics:

###### **PART 1 - GENERAL**

Scope  
Related Work  
References  
Submittals  
Quality Assurance  
Permits/Fees  
Safety  
Erosion and Sedimentation Control  
Environmental Contaminants  
Noise Pollution

###### **PART 2 - MATERIALS**

General

###### **PART 3 - EXECUTION**

General  
Sump Dewatering  
Well Installation  
Operation  
Removal/Abandonment

##### **1.02 RELATED WORK**

- A. Applicable provisions of the General Conditions and Division 01 govern work under this Section.

31 05 00 Common Work Results for Earthwork (Outside Building Footprint)  
31 25 00 Erosion Control

##### **1.03 REFERENCES**

- A. Wisconsin Department of Safety and Professional Services (SPS):  
Chapter NR 141 – Monitoring Well Construction  
Chapter NR 812 – Well Construction and Pump Installation.
- B. Wisconsin Department of Natural Resources Technical Standards for Construction Site Erosion & Sediment Control (Technical Standards):  
<http://www.dnr.state.wi.us/org/water/wm/nps/stormwater/techstds.htm#Construction>

##### **1.04 SUBMITTALS**

- A. When deep wells or well point systems are utilized, provide system design computations for the removal of groundwater and design information for sediment removal practices.

- B. For sump dewatering in trenches of excavations, provide copies of sediment removal practice selection discharge design calculations of information.
- C. When permits are required for dewatering, provide copies of all permits.
- D. Provide copies of daily monitoring and testing logs for dewatering practices as described in the DNR Dewatering Technical Standard.
- E. Provide copies of all borehole abandonment forms.

#### **1.05 QUALITY ASSURANCE**

- A. Provide and submit a quality assurance program for maintaining erosion control and sediment control practices. As work progresses through phases of the contract, submit copies of the updated quality assurance program for erosion control and sediment removal processes.

#### **1.06 PERMITS/FEES**

- A. Pay for and obtain all permits/approval required by local, state and federal regulations.
- B. Necessary permits/approval may include, but are not limited to high capacity well approval under NR 812.09 and erosion control permits.
- C. When installing by jetting methods, provide own water source. Do not use hydrants as water source without permission from Construction representative and/or local utility, as applicable. Obtain and pay for any required hydrant use and permits.

#### **1.07 SAFETY**

- A. Prevent public access to hazardous dewatering system components.
- B. Abandon boreholes in accordance with applicable local, state and federal codes immediately following use.

#### **1.08 EROSION CONTROL**

- A. Comply with the requirements of the specification sections listed under related work in part 1 of this section.
- B. Selection, installation, operation, and maintenance of erosion control and sediment removal measures related to a dewatering system shall be done in accordance with the DNR Dewatering Technical Standard or equivalent approved by the WDNR.
- C. Upon installation of the dewatering system, immediately remove any mud, sediment or drilling fluid generated by jetting or rotary drilling operations.
- D. When overland discharge of water is necessary, dissipate energy of water stream using nozzles, deflectors, riprap or other methods.
- E. Inspect dewatering system daily for signs of erosion and eliminate cause of erosion.

#### **1.09 ENVIRONMENTAL CONTAMINANTS**

- A. Monitor dewatering system discharge regularly for signs of chemicals or other environmental contaminants.

- B. If chemicals or environmental contaminants are observed, terminate dewatering system operation immediately and contact the Construction Representative.
- C. Prevent dewatering system from introducing contaminants into the soil or groundwater.

#### **1.10 NOISE POLLUTION**

- A. Provide mufflers, housing, berms and fencing as necessary to minimize noise pollution resulting from dewatering system operation.

### **PART 2 - MATERIALS**

#### **2.01 GENERAL**

- A. All deepwell and wellpoint dewatering equipment and well construction/abandonment materials shall meet the requirements of NR 141 and NR 812.

### **PART 3 - EXECUTION**

#### **3.01 GENERAL**

- A. Comply with all local, state and federal regulations.
- B. When deep wells or well point systems are utilized, prepare a system design and obtain permits in accordance with NR 812.09 for high capacity wells as defined by NR 812.07(53). Design system to dewater site as necessary to complete construction, but minimize impact on local water table. Monitor water levels in wells adjacent to construction site. Adjust dewatering system configuration and operation as necessary if neighboring wells are adversely impacted. Do not adversely impact neighboring private wells.
- C. Coordinate installation of dewatering system with other contractors. Locate dewatering system components in locations that do not interfere with site operations or other construction activities.
- D. Pump groundwater at lowest rate necessary to dewater site as required accommodating other sitework.

#### **3.02 SUMP DEWATERING**

- A. Install collection sump in the low point of the excavation(s).
- B. Provide filter material, trash screens and other devices around pump or intake to avoid pumping of sediment.

#### **3.03 OPERATION**

- A. Provide personnel, equipment and power necessary to maintain and operate the dewatering system as required to complete construction at the site.
- B. Do not discharge water containing sediment, debris or contaminants into the sanitary sewer system or waters of the state.

#### **3.04 REMOVAL/ABANDONMENT**

- A. Remove all dewatering system components immediately following use.

- B. Clean receiving storm sewer system of any sediment or debris deposits resulting from dewatering system operation.

END OF SECTION

**SECTION 31 25 00**  
**EROSION CONTROL**

**PART 1 – GENERAL**

**1.01 SCOPE**

- A. The work under this section consists of providing all work, materials, labor, equipment, and supervision necessary to provide and construct erosion control measures necessary to protect property and the environment. Included are the following topics:

PART 1 - GENERAL

Scope  
Related Work  
Permits  
Submittals  
Erosion Control Plan

PART 2 - MATERIALS

General  
Straw Bale Barriers  
Silt Fence  
Erosion Mat  
Staples  
Riprap  
Fieldstone Cobbles  
Tracking Pad Stone  
Soil Stabilizers  
Soil Tackifiers  
Polymers  
Anionic Polyacrylimides

PART 3 - EXECUTION

General  
Grading and Earthwork  
Drainage  
Tracking Control  
Maintenance

**1.02 RELATED WORK**

- A. Applicable provisions of Division 01 govern work under this Section.
- |                     |  |
|---------------------|--|
| Section 31 05 00    | Common Work Results For Earthwork (Outside Building Footprint) |
| Section 31 23 16.13 | Trenching  |
| Section 31 23 19    | Dewatering   |
- B. Provide erosion control in accordance with the following references:
1. Wisconsin Department of Natural Resources Technical Standards For Construction Site Erosion and Sediment Control:  
<http://dnr.wi.gov/org/water/wm/nps/stormwater/techstds.htm>
  2. Erosion Control Product Acceptability List ("PAL"), current version as published by the WisDOT: <http://www.dot.wisconsin.gov/business/engrserv/pal.htm>
- C. Method of measurement and basis of payment sections in any referenced erosion control documents shall not apply to this contract.

- D. These documents are available from:  
State of Wisconsin Document Sales and Distribution  
202 South Thornton Avenue  
P.O. Box 7840  
Madison, WI 53707  
(608) 266-3358

### **1.03 PERMITS**

- A. Contractor shall be responsible for obtaining and maintaining all erosion control permits associated with the project.

### **1.04 SUBMITTALS**

- A. The Lead Contractor will submit the following to the Architect/Engineer:
1. Contractor shall mark-up of the Erosion Control Plan that is included in these documents showing additional or alternate erosion control measures as needed due to the Contractor's means and methods throughout all phases of construction. The Contractor may also be required to submit calculations and backup information showing the proposed measures meet applicable regulations.
  2. Submittals for materials used to implement the erosion control plan.
- B. Submit shop drawings for the following erosion control features as indicated in Section 31 00 05 Civil General Requirements:
1. Silt Fence
  2. Inlet Sediment Guards
  3. Erosion Mat
  4. Fieldstone Cobbles (provide on-site sample)

### **1.05 EROSION CONTROL PLAN**

- A. The Engineer has prepared an erosion control plan for the project and will apply for the NOI/WRAPP permit. The Contractor shall provide the Engineer notice of the intended project start date at least 21 business days in advance to allow Engineer time to prepare and acquire the permit. It is the Contractor's responsibility to ensure all required permits are in place prior to starting construction. The Contractor will provide the Architect/Engineer with submittals for materials used to implement the erosion control plan, as well as any modifications to the erosion control plan that are necessary due to the Contractor's means and methods of construction.
- B. Contractor shall comply with all the requirements of the erosion control plan, and if applicable, the Wisconsin Pollutant Discharge Elimination System, WPDES. If applicable, the project specific WPDES Construction Site Stormwater Discharge Permit for Erosion Control shall supersede the General Permit.
- C. Erosion control and storm water management practices shall be installed and maintained in accordance with the WDNR approved Technical Standards (or equivalent).
- D. Contractor shall provide all erosion control practices necessary to protect property and the environment. Erosion control and storm water management practices shall be installed and maintained in accordance with WDNR approved Technical Standards (or equivalent). The Contractor shall prepare an erosion control plan in accordance with Chapters NR 151, NR 216, and Wisconsin Department of Safety and Professional Services SPS 360; submit this plan to the Architect/Engineer and DSF Construction Representative. The Contractor shall update and modify the erosion control plan as needed for phasing of work. A copy of the current erosion control plan shall be maintained at the project site.

## **PART 2 – MATERIALS**



## **2.01 GENERAL**

- A. Erosion mats, soil stabilizers, and tackifiers shall be listed on the Product Acceptability List for Multi-Modal Applications ("PAL") as published by the Wisconsin Department of Transportation.
- B. When the design or contract includes permanent erosion control or stormwater control features, the contractor may employ these items in his control of erosion and stormwater during his construction activities. However, these items shall be fully cleaned, restored, and in every way fully functioning for its intended permanent use prior to acceptance of the work.

## **2.02 STRAW BALE BARRIERS**

- A. Rectangular bales of hay or straw, tightly bound with twine, not wire.
- B. Anchor stakes shall be "T" or "U" steel posts, or hardwood, 2.0 by 2.0 inches nominal. Rebar shall not be used to anchor bales.

## **2.03 SILT FENCE**

- A. Fence fabric shall comply with the requirements of Standard Specifications for Highway Construction 628.2.6, in 3 foot tall rolls, with 4' tall 2" x 2" nominal cross section hardwood posts spaced a maximum of 10' O.C. Silt fence shall be Mirafi, Trevira, Amoco, CFM, or approved equal.

## **2.04 EROSION MAT**

- A. A straw/coconut fiber mat encased in an accelerated photodegradable polypropylene top net. Erosion mat shall comply with the requirements of Class I, Type A erosion mat as defined by Standard Specifications for Highway Construction and the PAL. Erosion mat shall be American Excelsior, SI Geosolutions, Erosion Control Systems, North American Green, or approved equal.
- B. Concentrated Areas/Channels (as indicated on plans): This mat shall be North American Green SC150, or approved equal.
- C. Erosion Mat at Storm Outlets: This mat shall be ProPex LandLok 300, or approved equal.
- D. Erosion Mat in bio-filtration areas shall be North American Green SC-150BN or approved equal.

## **2.05 STAPLES**

- A. Use staples conforming to Standard Specifications for Highway Construction 628.2.3 to anchor erosion mat. Staples shall be U-shaped of No.9 gauge, or heavier steel wire, or other approved materials, with a width of one to two inches and not less than 6 inches for firm soils; not less than 12 inches for loose soils.

## **2.06 FIELDSTONE COBBLES**

- A. Stone shall be the size and type specified on plans. Contractor shall provide an on-site sample for approval prior to installation.

## **2.07 TRACKING PAD STONE**

- A. The aggregate for tracking pads shall be 3 to 6 inch clear or washed stone. All materials shall be retained on a 3-inch sieve.

## **2.08 SOIL STABILIZERS**

- A. Soil stabilizers shall be non-asphalt-based products of the type specified, and meeting the

requirements of the PAL.

#### **2.09 SOIL TACKIFIERS**

- A. Soil tackifiers shall be non-asphalt based products of the type specified and meeting the requirements of the PAL.

#### **2.10 POLYMERS**

- A. Polymers used to settle suspended sediment shall meet the requirements of the WDNR Technical Standards.

#### **2.11 ANIONIC POLYACRYLAMIDE**

- A. Water soluble anionic polyacrylamide (PAM) used as temporary soil binding agents to reduce erosion shall meet the requirements of WDNR Technical Standards.

#### **2.12 RIP-RAP**

- A. Rip rap shall be the class specified and shall conform to Standard Specifications for Highway Construction Section 606.2.

### **PART 3 – EXECUTION**

#### **3.01 GENERAL**

- A. Install erosion control measures as required by the erosion control plan and contract documents. Provide additional erosion control measures as dictated by Contractor's means and methods, or by differing site conditions. Notify Construction Representative of additional erosion control features that are provided, but not shown on the plan.
- B. Contractor shall provide all erosion control measures necessary to protect property and the environment. Include all erosion control measures as required by the most stringent of applicable sections of DNR Technical Standards or the Standard Specifications for Highway Construction.
- C. Perform all work in accordance with manufacturer's instruction where these specifications do not specify a higher requirement.
- D. Contractor shall comply with all the requirements of the erosion control plan, and if applicable, the WPDES Stormwater Discharge Permit for Erosion Control, including required monitoring and documentation.

#### **3.02 GRADING AND EARTHWORK**

- A. Install all temporary or permanent erosion control measures prior to any onsite grading or land disturbances.
- B. Clear only those areas designated for the placement of improvements or earthwork before placement of the final cover. Perform stripping of vegetation, grading, excavation, or other land disturbing activities in a logical sequence and manner which will minimize erosion. If possible, schedule construction for times of the year when erosion hazards are minimal.
- C. Do not clear the site of topsoil, trees, and other natural ground covers before the commencement of construction. Retain natural vegetation and protect until the final ground cover is placed.
- D. Temporary stockpiles are to be located greater than 25 feet from any roadway, parking lot, paved area, drainage structure, or channel.

- E. Provide temporary stabilization and control measures (seeding, mulching, covering, erosion matting, barrier fencing, etc.) for the protection of disturbed areas and soil piles which will remain uncovered for a period of more than 7 consecutive calendar days.
- F. Remove surplus excavation materials from the site immediately after rough grading. The disposal site for the surplus excavation materials shall also be subject to these erosion control requirements.

### **3.03 DRAINAGE**

- A. Minimize water runoff and retain or detain on-site whenever possible so as to promote settling of solids and groundwater recharge.
- B. Convey drainage to the nearest adequate stormwater facility. Do not discharge water in a manner that will cause erosion or sedimentation of the site or receiving facility.
- C. Protect storm sewer inlets and catch basins in accordance with the erosion control plan, if provided, a log with the WDNR Technical Standards and PAL. If not specified, protect inlets with straw bale barriers, silt fencing, filter basket, or other equivalent methods approved by the Engineer which provide the necessary erosion protection.
- D. Divert roof drainage and runoff from all areas upslope of the site around areas to be disturbed or channel them through the site in a manner that will not cause erosion.
- E. Ditch checks are to be provided in swales or ditches to reduce the velocity of water in the channel. Construct in accordance to DNR Technical Standards and PAL.
- F. Minimize the pumping of sediments when dewatering. Discharge to a sedimentation basin or sedimentation vessel to reduce the discharge of sediments. Do not discharge water in a manner that will cause erosion or sedimentation of the site or receiving facility. Refer to Section 31 23 19 – Dewatering for specifics.

### **3.04 TRACKING CONTROL**

- A. Construct and maintain tracking pads in accordance with the Technical Standards. Provide each entrance to the site with a stone tracking pad at least 50 feet in length with a minimum thickness of 12 inches. The tracking pad shall be the full width of the egress point. Inspect tracking pads on a daily basis and replace aggregate when no longer effective.
- B. If necessary, provide a crushed aggregate paved parking area.
- C. If applicable, wash water shall be discharged to sedimentation basins, sedimentation vessels, or other such control areas.

### **3.05 MAINTENANCE**

- A. Inspect all erosion control measures within 24 hours of the end of each rainfall event that exceeds 0.25", or daily during period of prolonged rainfall, or weekly during periods without rainfall. Immediately repair and/or replace any and all damaged, failed, or inadequate erosion control measures.
- B. Re-apply soil stabilizers, tackifiers, polymers and anionic polycrylamides as needed to prevent erosion of exposed soil.
- C. Maintain records of all inspections and any remedial actions taken.

- D. Maintain stockpile stabilization measures as necessary after rainfall events and heavy winds. Replace tarps, re-seed, and reapply mulch, tackifiers and stabilizers as necessary.
- E. Remove sediment from stormwater and erosion control structures, basins and vessels as necessary.
- F. Repair or replace damaged inlet protection.
- G. Replace or supplement stone tracking pads with additional stone when they become ineffective.
- H. Remove any sediment reaching a public or private roadway, parking lot, sidewalk, or other paved. Do not remove tracked sediments by flushing. Completely remove any accumulations not requiring immediate attention at least once daily at the end of the workday.
- I. Frequently dispose of all waste and unused construction materials in licensed solid waste or wastewater facilities. Do not bury, dump, or discharge, any garbage, debris, cleaning wastes, toxic materials, or hazardous materials on the site, on the land surface or in detention basins, or otherwise allow materials to be carried off the site by runoff onto adjacent lands or into receiving waters or storm sewer systems.

END OF SECTION

## SECTION 31 40 00

### UNDERPINNING

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

- A. Work Included: As a Design-Build Contractor, provide all design, work, labor, materials, equipment, protection, safety and supervision necessary to complete all underpinning and related work shown on drawings and specified herein, and where required to supplement and be a part of the earth retention system.
- B. Related Work: Earthwork - Section 31 00 00.

##### **1.02 QUALITY ASSURANCE**

- A. Contractor for underpinning work shall be responsible for adequate design and construction of all shoring, form work, phasing of excavation, underpinning, and tiebacks for new and/or existing construction. Conform to all applicable safety standards.
- B. The Contractor shall employ adequate numbers of experienced, skilled tradesmen for the Work, who are familiar with all the methods, materials, requirements and their standards needed for the proper performance of the work specified and as follows:
  - 1. Contractor shall obtain and pay for the services of a Structural Engineer, licensed in the State in which the project is located, to design the earth retention and underpinning system.
  - 2. Underpinning Design Engineer shall make periodic on-site inspections to insure that installation complies with design, and shall issue field reports certifying same to Architect and Engineer.
- C. Testing and Inspection Service: Owner shall engage a testing and inspection service for quality control during underpinning operations.
  - 1. Testing agency representatives on the site are required to read and understand the requirements of the Construction Documents, the Soil Report, the Underpinning plans and calculations and this specification.
  - 2. Testing agency shall perform visual inspections of excavations, and perform necessary geotechnical tests to verify soil bearing pressures and acceptability of underpinning segment.
  - 3. Inspector shall verify reinforcing bar size, number and spacing, clear cover, splice locations and laps, special details and conformance to the Underpinning Documents.
  - 4. Inspector shall perform concrete/shotcrete cylinder tests conforming to Section 03 30 00.
  - 5. Inspector shall verify and report that shotcreting operations conform to acceptable standards.
  - 6. Approval by Inspector must be given prior to the placing of any concrete or fill material, and whenever the Soil Report or actual conditions encountered indicate loose or variable soil conditions, variable soil coloration, unexpected materials, excessively wet soils, etc. Do not proceed if unsuitable conditions are encountered. Notify Underpinning Contractor, the Underpinning Designer and the Structural Engineer immediately.
  - 7. Any necessary corrections shall be identified and documented.
  - 8. Testing agency shall provide to Architect and Structural Engineer written field reports.
- D. Maintenance of Services: Locate, protect, support, and maintain uninterrupted all utilities, equipment, services, and owner's and tenant's chattels within the limits of the underpinning work, or relocate same as indicated or required.
- E. Contractor shall provide as-built drawings and any supplemental calculations to the Architect and Structural Engineer.

- F. Performance:
1. The Underpinning Contractor shall assume full responsibility for the design, performance and integrity of the entire underpinning system and shall be the Engineer of Record. Liability for the system shall include, but not be limited to, the design of the underpinning, all installation and erection means, methods or techniques, and integrity of the installation to support the existing building and utilities without damage to the existing construction.

### **1.03 UNDERPINNING DESIGN AND CRITERIA**

- A. The length of underpin excavation and concrete pour shall be determined by the following:
1. Concentrated loads, such as walls bearing joists and/or beams.
  2. Condition of concrete and/or masonry wall and its ability to support loads.
  3. Condition and size of footing to be underpinned.
  4. Soil conditions. Review soil report and actual soil conditions.
  5. The concrete forming system.
  6. Vertical loads as specified on the Structural Drawings, or if not specified, use the footing width and allowable soil bearing pressure.
  7. Lateral loads from soil pressure plus existing building floor surcharge. Allow for a surcharge on the floor behind the wall of 150 psf.
  8. Maximum Tolerable Lateral Wall Deflection: 1/4 inch at top or bottom of wall.
  9. Maximum Tolerable Settlement of Existing Foundation: 1/4 inch.
- B. The underpinning system shall be designed by this contractor with the frequency and length of excavation and concrete pour determined by the basic criteria established herein and the safety of the existing building and workman performing the work. Underpinning may be required in combination with an earth retention system utilizing tiebacks.
- C. Design Parameters for Tieback Anchors:
1. Tendon design load not to exceed 60 percent of guaranteed ultimate tensile strength.
  2. Proof or performance tests shall not exceed 80 percent of guaranteed ultimate tensile strength.
  3. Free Stressing Length: 20 feet minimum, but fully beyond the active soil wedge defined by a 30 degree angle from the bottom of the excavation.

### **1.04 QUALIFICATIONS**

- A. This contractor shall have at least 5 years' experience in the performance of all phases of underpinning work and have performed at least 3 projects of the size and scope of this work in the past 3 years.
- B. Submit a list of 3 jobs of similar size and scope giving the name and address of the project, the name, address and phone number of the Owner, the Architect or Professional Engineer of record and if applicable, the name, address and phone number of the General Contractor/Construction Manager.

### **1.05 SUBMITTALS**

- A. Before proceeding with sheet piling, bracing, shoring or underpinning work, furnish a written schedule and detailed drawings to Architect of proposed methods for review, with stamped engineering calculations.
- B. Shop Drawings: Submit Shop Drawings, indicating method, staging, and necessary details for construction of underpinning and support for each structure on which work is to be performed.
- C. Procedures:
1. Submit procedure for detection of movement, as specified in Article 3.01 herein.
  2. Submit procedure for preloading (jacking load) new foundations.
  3. Submit procedure for proof load testing and preloading (jacking load) of lateral support systems, such as strut and tieback assemblies.

- D. Jacking Gage Calibration: Submit data for the pressure gage and jack combinations certified by an accepted testing laboratory not earlier than 14 days prior to start of use for underpinning.
- E. Underpinning Design Engineer shall submit written verification that construction conforms to design.
- F. Tieback Installation Records: Submit tieback installation logs. Logs shall include, at a minimum: plan location of tieback, length, grout volume, pumping delays or stoppage, and load test results.
- G. Provide written reports from Owner's Testing and Inspection Service.

## **1.06 EXISTING CONDITION SURVEY**

- A. Before proceeding, the Contractor shall hire an approved Registered Surveyor to prepare a precision survey ( $\pm 0.0625$  inch) of all the existing conditions which might be affected by the Subcontractor's operations. Photographs shall be included in the survey.
- B. Establish control points on existing foundations to monitor horizontal and vertical movements during construction.
- C. Throughout the period of the excavation work, keep adjacent structures under observation for level, plumb and other conditions. Immediately report to Architect any movement, settlement, new cracks or other observed new defects, and halt operations.
- D. Upon completion of the Work, make a similar examination of the property originally surveyed, giving notice to all parties so that they may be present during the final examination of the property. Records of the final examination and a signed copy of the original and final examinations shall be given to all parties.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. Earthwork: Conform to the requirements of Section 31 00 00.
- B. Concrete Formwork: Conform to the requirements of Section 03 10 00.
- C. Concrete Reinforcing: Conform to the requirements of Section 03 20 00.
- D. Concrete and Grout: Conform to the requirements of Section 03 30 00.
- E. Structural Steel: Conform to the requirements of Section 05 10 00.
- F. Shotcrete may be used in lieu of formed and poured concrete. Conform to the requirements of Section 03 37 13.
- G. Tieback Soil Anchors: Permanent, grouted, and post-tensioned tendons with a double corrosion protection system. Dywidag Systems International, or equal.
- H. Grouting: (After concrete has set 24 hours)
  - 1. Materials:
    - a. Ready to use, non-shrink grouting material requiring only mixing with water at job site.
      - 1) "Sika Grout 212", Sika Chemical Co.
      - 2) "Five Star Grout", U.S. Grout Company
      - 3) "Euco-NS", Euclid Chemical
      - 4) Approved equal
  - 2. Mix:
    - a. For clearance less than 2" or where placement is difficult, grout shall be comprised of ready-to-use grouting material only.

- b. For clearances over 2" in thickness, 50 lbs. of pea gravel may be added to each 100 lbs. of ready-to-use grouting material.
  - c. Use only minimum amount of water to produce flowable grout.
  - d. Mixing shall be in strict conformance with manufacturer's specifications.
- I. Helical piers or other piling systems as required, subject to approval. Reference Section 31 62 16.10.
- J. Jet Grout Underpinning, subject to approval. Reference Section 31 48 13.

## **2.02 EQUIPMENT**

- A. Contractor shall select excavation equipment of adequate size that will perform excavation in an expeditious manner.
- B. Contractor shall select de-watering sumps and pumps of adequate size to maintain footing excavations reasonably dry.

## **PART 3 - EXECUTION**

### **3.01 DETECTION OF MOVEMENT**

- A. For each existing structure that may be affected by the work, install settlement markers on each footing, building corners, wall or surrounding improvements to be monitored. Settlement markers shall be capable of being read to an accuracy of 1/16 inches (0.0625").
- B. Take and record readings not less than once per week during performance of the work until the permanent structures are complete.
- C. Stop work; notify the Engineer, and take immediate remedial action if movement of the existing structure occurs during performance of the work.
- D. Upon completion of the work, take weekly readings of the measurement points for a period of 4 weeks, or longer, if movement persists, and report the results to the Engineer.
- E. The detection of movement shall be performed by a qualified licensed land surveyor or Civil Engineer hired by the Contractor.

### **3.02 PROTECTION**

- A. Protect excavations and existing building by shoring, bracing, sheet piling, de-watering devices or any other method required to prevent cave-in or loose soil from falling into excavation. Existing building shall remain operational throughout construction period. No slab on grade or building settlement is allowed in excess of specified tolerances.
- B. Protect existing appurtenances and parts of existing structure while excavating for underpinning and during concrete operations.

### **3.03 INSTALLATION**

- A. Visit site and determine the location of walls, size of loads, extent of shoring and forming for work to be underpinned.
- B. Use equipment of the proper and adequate size, capacity and numbers of tradesmen to accomplish the Work of This Section in phased and timely manner.
- C. Do not commence work without submittal and review of method and materials of underpinning proposed.
- D. Do not commence placement of concrete until mix designs have been reviewed by the Architect.



### **3.04 SHORING**

- A. Support existing structure to maintain work safe to life, limb and property.
- B. When required, install sheeting or sheet piling. Brace to maintain banks in safe, stable condition.
- C. Install shoring as required to prevent damage to structure as a result of work. Use sound timber or structural steel shapes of sufficient dimension for work. Jacks and jacking equipment shall be more than adequate for the imposed loads and shall be provided with calibrated gages.
- D. Work removed or damaged through installation and removal of shoring, temporary protective work or improper work shall be repaired in approved manner.

### **3.05 UNDERPINNING**

- A. Excavating:
  - 1. Excavate as indicated on Structural and/or Underpinning Drawings.
  - 2. Before proceeding with underpinning, consult with Architect's Engineer to verify elevations.
  - 3. Excavate in phases in manner to avoid undermining more than 5 feet of wall at any one time.
  - 4. Notify the Architect and Underpinning Design Engineer of any unexpected subsurface conditions and discontinue affected work in area until notified to resume work.
- B. Underpinning:
  - 1. Thoroughly clean underside of existing footings.
  - 2. Pour new footings as shown on detail drawings.
  - 3. Place form to proper line and bring concrete up to within approximately 3" of the bottom of the existing foundation for grouting. See Section 03300 for Cast-In-Place Concrete specification and Section 03200 for Reinforcing Steel.
  - 4. Dowel all sections of underpinning into adjacent section with bars equivalent to specified horizontal reinforcing.
- C. Where earth forms are indicated, install waterproof building paper or board between the earth and concrete to prevent water loss from the fresh concrete.
- D. Grouting:
  - 1. Grout shall be placed quickly and continuously by whatever means most practical within three days of concrete placement.
  - 2. Grout shall completely fill space to be grouted and be thoroughly compacted, free of air pockets. Use Drypack grout as required.
- E. Do not remove support of existing structure until concrete piers, walls, or pile caps have attained design strength.
- F. Provide and install Helical Piers or other piling systems as required, per Manufacturer's and/or Specialty Contractors requirements and guidelines.
- G. After underpinning, remove such portion of footings extending from wall that interfere with new wall facings or construction.

### **3.06 TIEBACK SOIL ANCHORS**

- A. Install anchors according to manufacturer's recommendations and as recommended in the most current edition of the Post-Tensioning Manual as published by the Post-Tensioning Institute. The load in the anchor tendons shall remain adjustable.
- B. Tieback Soil Anchor Testing:
  - 1. Conduct Proof and Performance tests in accordance with recommendations in the most current edition of the Post-Tensioning Institute.

2. The first three (3) anchors, and 2 percent of the remaining anchors, shall be performance tested. The remaining anchors shall be proof tested. Performance tests shall load the anchors to 1.5 times their design load.
3. Perform a lift-off test on each anchor prior to removing the jack.
4. Acceptance criteria shall be as stated in the Post-Tensioning Manual.
5. Provide load cells and extensometers on 5 percent of the anchors for long-term monitoring.
6. Frequency of testing as outlined herein may be modified upon approval of the Architect once consistently reproducible results are obtained.

### **3.07 REPAIR**

- A. Upon completion of work, repair all existing construction, subject to Architect's approval, damaged by the underpinning process, as identified in the final condition survey.

### **3.08 CLEAN UP**

- A. Work area shall be cleared and materials disposed of or recycled in accordance with project environmental management plan.

END OF SECTION

## SECTION 31 62 16.10

### HELICAL STEEL PIERS

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

- A. Work Included:
  - 1. Provide design, loading and testing, articles, material operations and methods, including labor, equipment and related items necessary to furnish and install all helical piers and brackets shown on drawings and as required to complete the project.
  - 2. This specification is only applicable if specified and used by the Underpinning Contractor. Reference Underpinning Section 31 40 00.

##### **1.02 QUALITY ASSURANCE**

- A. Reference Standards: The following latest edition reference specification shall become a part of this Specification as if written herein. If provisions of reference standards and this Section conflict, the more stringent provisions shall govern.
  - 1. AC358: Acceptance Criteria for Helical Pier Foundations and Devices.
- B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- C. Approved System/Installers:
  - 1. Steel Helical Pier Foundation System:
    - a. Round or square shafts with helically shaped steel plates with sleeve and top plate with all other necessary hardware and connections with a minimum rated downward capacity in bearing of 40,000 lbs., and uplift capacity of 10,000 lbs., using a safety factor of 2.0.
      - 1) Chance Helical Pier, A.B. Chance Co., Centralia, MO and their Certified Installers.
      - 2) Atlas-Helical Products, Atlas Systems Inc., Independence, MO and their Certified Installers.
      - 3) Foundation Supportworks, Omaha, NE and their Certified Installers.
      - 4) Approved equal.
    - b. Hot-dip galvanize, according to ASTM A153-82.
    - c. Design shall be performed by a Professional Engineer, hired by the Specialty Contractor, licensed in the State in which the project is located. Provide stamped calculations to the Architect.
- D. Tolerances:
  - 1. To exceed the following maximum may be cause for rejection of the pier and additional piers may be ordered installed:
    - a. Helical piers shall be installed within 3 inches of the indicated plan location.
    - b. Helical pier shaft alignment shall be within 2 degrees of the inclination angle shown on the plans.
    - c. Top elevation of helical piers shall be within 2 inches of the design vertical elevation.
    - d. When pier placement is not shown on the project plans, the placements, alignments and their respective tolerances shall be included as part of the design submittal.
  - 2. There will be no payment for rejected piers required to be corrected due to such rejection.

- E. Design and Performance Requirements:
1. Helical piers shall be designed to support the nominal compressive and tension load(s) as shown on the project plans. The overall length, helix configuration and minimum torsional resistance of a helical pier shall be such that the required geotechnical capacity is developed by the helix plate(s) in an appropriate bearing stratum.
  2. All steel structure pier components shall be designed within the limits provided by the American Institute of Steel Construction (AISC). Either Allowable Stress Design (ASD) or Load & Resistance Factor Design (LRFD) are acceptable methods of analysis. Product testing in accordance with ICC-ES Acceptance Criteria 358 may also be considered as an acceptable means of establishing allowable system capacities.
  3. Except where noted otherwise on the project plans, all piers shall be installed to provide a minimum factor of safety against ultimate bearing resistance of 2. Piers must satisfy the deflection criteria stated in the "Load Test" section of this specification.
  4. Except where noted otherwise on the project plans, each pier shall be designed to meet a corrosion service life of 50 years in accordance with ICC-ES Acceptance Criteria 358.
  5. The pier design shall take into account such pier spacing, soil stratification, corrosion and strain compatibility issues as are present for the project.
  6. Design Capacity:
    - a. Contractor shall determine driving depth to most economically achieve the required capacities shown on drawings, subject to Soil Engineer review and approval.
    - b. Specified capacity is net required.
- F. Protection:
1. Protect structures, underground utilities and other construction from damage caused by pier installation operations. Pre-excavate for piers, if required, as herein specified, at no additional cost to Owner.
- G. Provide surveyed elevation benchmarks on structures before commencing work, when structures are adjacent to pier placement operations. Record and report elevation of each benchmark after installing each pier. Should benchmark readings indicate displacement in excess of 1/16 inch, halt installation operations until corrective action has been provided and is acceptable to Architect/Engineer.

### **1.03 CONDITIONS**

- A. Preliminary Information pertaining to explorations and other investigations appear in the Soil Report.
1. Data shown does not guarantee that conditions indicated are entirely representative of those actually existing or that unexpected developments may not occur.
  2. Contractor shall make own interpretations of the data available and satisfy self as to materials upon which work may be placed.
  3. This information represents soil conditions at the specific locations of the borings at the time the borings were made. Any interpretation at intermediate points as representative of soil conditions is to be used at Contractor's own risk.

### **1.04 INSPECTION AND TESTING OF PIERS**

- A. For helical piers, the approved installer or their agent shall determine necessary length and installation to provide required capacity.

### **1.05 SUBMITTALS**

- A. Provide ICC-ES product evaluation reports. Product tests shall be conducted by an International Accreditation Service laboratory. Report shall contain capacity to torque ratios to be used during installation to verify capacity.
- B. Evidence of installing contractor's competence in the installation of helical piers shall be provided.
1. Pier manufacturer's certificate of competency in installation of helical piers.

2. A list of at least three projects completed within the previous three years wherein the installing contractor installed helical piers similar to those shown in the project plans. Such list to include names and phone numbers of those projects' Owner's representatives who can verify the installing contractor's participation in those projects.
- C. Evidence of pier designer's competence in the design of helical piers shall be provided.
    1. Registration as a Professional Engineer in the State in which the project is located.
    2. A list of at least three projects completed within the previous three years wherein the pier designer designed helical piers similar to those shown in the project plans, such list to include names and phone numbers of those projects' Owner's representatives who can verify the engineer's participation in those projects.
  - D. Provide P.E. stamped calculations to the Engineer of Record.
  - E. Submit Installation Records and field test results.
  - F. Provide P.E. certification letter that installation conforms to design intent.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. Steel piers of thickness sufficient to withstand installation to the required resistance and adequate to withstand underground forces developed during installation. The steel shall meet the requirements of the following:
  1. Steel Helical Piers: Material conforming to A.B. Chance product literature and specification, or approved equal.

## **PART 3 - EXECUTION**

### **3.01 DELIVERY, STORAGE AND HANDLING**

- A. General Contractor shall provide for this Specialty Contractor sufficient access to site, safe space to maneuver the installation equipment, gently sloping access ramps, and suitable soils or fill for installation equipment.
- B. Store piers in orderly groups above ground and blocked during storage to minimize possible distortion of members. Piers exhibiting variations beyond tolerance limits will be considered distorted and may not be used in the Work.

### **3.02 INSTALLATION**

- A. The installing contractor shall conduct his construction operations in a manner to insure the safety of persons and property in the vicinity of the work. The installing contractor's personnel shall comply with safety procedures in accordance with OSHA standards and any established project safety plan.
- B. Work shall be done under the direct supervision of a competent superintendent or foreman who is experienced with the particular pier system to be placed for the Project.
  1. Steel Helical Piers shall be installed by approved Certified Installer of helical pier supplier to a torque specified by helical pier supplier to achieve a minimum net load-capacity of 40,000 lbs. per pier.
- C. When given the order to commence work, Contractor must be able to put in a continuous eight hour day shift for the entire construction period.
- D. Piers shall be installed with due consideration for the safety of adjacent buildings and underground utilities and by methods which will leave their strength unimpaired.

### 3.03 TERMINATION CRITERIA

- A. The minimum overall length criteria and the minimum torsional resistance criteria as specified in the Pre-Construction Submittals must be satisfied prior to terminating the pier installation. In the event any helical pier fails to meet these production quality control criteria, the following pre-qualified remedies are authorized:
1. If the installation fails to meet the minimum torsional resistance criterion at the minimum embedment length:
    - a. Continue the installation to greater depths until the torsional resistance criterion is met, provided that, if a maximum length constraint is applicable, continued installation does not exceed said maximum length constraint, **OR**
    - b. Demonstrate acceptable pier performance through proof testing, **OR**
    - c. Replace the pier with one having a different helix configuration. The replacement pier must not exceed any applicable maximum embedment length and either (A) be embedded to a length that places its last helix at least three times its own diameter beyond the position of the first helix of the replaced pier and meet the minimum torsional resistance criterion, or (B) pass proof testing.
  2. If the torsional resistance during installation reaches the helical pier's allowable torque rating prior to satisfaction of the minimum embedment length criterion:
    - a. Terminate the installation at the depth obtained if allowed by the Owner's representative, **OR**
    - b. Replace the pier with one having a shaft with a higher torsional strength rating. This replacement pier must be installed to satisfy the minimum embedment length criterion. It must also be embedded to a length that places its last helix at least three times its own diameter beyond the position of the first helix of the replaced pier without exceeding any applicable maximum embedment length requirements and it must meet the minimum torsional resistance criterion, **OR**
    - c. Replace the pier with one having a different helix configuration. This replacement pier must be installed to satisfy the minimum embedment length criterion. It must also be embedded to a length that places its last helix at least three times its own diameter beyond the position of the first helix of the replaced pier without exceeding any applicable maximum embedment length requirements, and it must meet the minimum torsional resistance criterion, **OR**
    - d. If allowed by the pier location tolerance or approved by the Owner's representative, remove and reinstall the pier at a position at least three times the diameter of the largest helix away from the initial location. Original embedment length and torsional resistance criteria must be met. This pier repositioning may require the installation of additional helical piers with nominal loads adjusted for these spacing changes.
  3. If the installation reaches a specified maximum embedment length without achieving the minimum torsional resistance criterion:
    - a. If allowed by the pier location tolerance or approved by the Owner's representative, remove and reinstall the pier at a position at least three times the diameter of the largest helix away from the initial location. Original embedment length and torsional resistance criteria must be met. This pier repositioning may require the installation of additional helical piers with nominal loads adjusted for these spacing changes, **OR**
    - b. Demonstrate acceptable pier performance through proof testing, **OR**
    - c. De-rate the load capacity of the helical pier and install additional piers as necessary. The de-rated capacity and additional pier location shall be subject to the approval of the Owner's representative, **OR**
    - d. Replace the pier with one having a different helix configuration. This replacement pier must be installed to satisfy the minimum embedment length criterion and it must meet the minimum torsional resistance criterion.
  4. If a helical pier fails to meet acceptance criteria in a performance or proof test:
    - a. Install the pier to a greater depth and installation torque and re-test provided that, if a maximum embedment length constraint is applicable, continued installation will not exceed said maximum length constraint, **OR**

- b. Replace the pier with one having more and/or larger helix plates. It must be embedded to a length that places its last helix at least three times its own diameter beyond the position of the first helix of the replaced pier without exceeding any applicable maximum embedment length requirements. This replacement pier must be re-tested, **OR**
  - c. If approved by the Owner's representative, de-rate the load capacity of the helical pier and install additional piers. Additional piers must be installed at positions that are at least three times the diameter of the largest helix away from any other pier locations and are approved by the Owner's representative. Piers installed in cohesive soils shall not be spaced closer than four helix diameters.
- 5. Proof testing to qualify a pier under any of the foregoing remedial actions shall not be used to satisfy proof testing frequency requirements shown in the project plans or the design documentation. If a helical pier fails a production quality control criterion for any other reason, any proposed remedy must be approved by the Owner's representative prior to initiating its implementation at the project site.

### **3.04 FIELD QUALITY CONTROL**

- A. Installation Records:
  - 1. All necessary records to approve the acceptance of the piers will be kept by Helical Pier Contractor.
  - 2. Submit copies of installation record of each pier not later than 2 days after installation. Include date, start and finish time (and delay time), pier location and number, computed bearing capacity, and any unusual occurrences during installation.
  - 3. This shall be incorporated into the Record Drawings showing the length of every pier installed.
- B. Load Tests:
  - 1. One compression Test shall be conducted, either "Working Load Test" or "Ultimate Load Test", in conformance with latest ASTM D1143 "Standard Test Method for Piles under Static Axial Compressive Load." Maximum deformation used to define ultimate load capacity is one inch, with at least 50 percent rebound. Acceptable permanent deformation is one-half inch.
  - 2. Where helical piers are required to resist uplift, one tension test shall be conducted to determine the ultimate tension load capacity of an anchor in conformance with latest ASTM D3689 "Standard Test Method for Piles under Static Axial Tensile Load." Maximum deformation used to define ultimate load capacity is one inch, with at least 50 percent rebound. Acceptable permanent deformation is one-half inch.
  - 3. Where vertical or battered piers are used for lateral support, conduct one ultimate lateral load test in conformance with latest ASTM D3966 "Standard Test Method for Pile under Lateral Loads." Ultimate lateral load is defined as 200% of the design load requirement. Acceptable maximum deflection used to define ultimate load capacity is one-half inch with 50 percent rebound.

### **3.05 CLEANUP**

- A. The installing contractor shall remove any and all material, equipment, tools, building materials, concrete forms, debris, or other items belonging to the installing contractor or used under the installing contractor's direction.

### **3.06 UNIT PRICES**

- A. Provide unit price per linear foot of helical pier supplied and installed.
- B. Payment will be based on actual linear feet of pile installed.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**



## SECTION 33 05 00

### COMMON WORK RESULTS FOR UTILITIES

#### **PART 1 – GENERAL**

- A. This section provides information common to two or more technical site work specification sections or items that are of a general nature, and not included in other sections. This section applies to ALL site work, as applicable. Included are the following topics:

##### PART 1 - GENERAL

Scope  
Related Work  
Reference  
Referenced Organizations  
Referenced Documents  
Quality Assurance  
Safety  
Permits  
Construction Limits  
Equipment and Materials Furnished by Others  
Provisions for Future Work  
Work by Others  
Submittals  
Off Site Storage  
Codes  
Certificates and Inspections  
Operation and Maintenance Data  
Pavement Removal and Replacement

##### PART 2 - MATERIALS

Barricades, Signs, and Warning Devices  
Temporary Plastic Barrier Fencing

##### PART 3 - EXECUTION

Maintenance of Site and Building Access/Egress  
Continuity of Existing Traffic/Parking and Traffic Control  
Protection and Continuity of Existing Utilities  
Protection of Existing Work and Facilities  
Stormwater/Excavation Water Management  
Frost and Freezing Protection  
Clay Trench Dam – Utility Trenches

#### **1.02 RELATED WORK**

- A. Applicable provisions of Division 01 govern work under this Section.

33 11 00	Water Utility Distribution Piping
33 30 00	Sanitary Sewage Piping
33 40 00	Storm Drainage Utilities

#### **1.04 REFERENCED ORGANIZATIONS**

- A. Applicable provisions of Division 01 shall govern all work under this section.
- B. Abbreviations of organizations referenced in these specifications are as follows:

AASHTO	American Association of State Highway and Transportation Officials
ACPA	American Concrete Pipe Association
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers

ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
AWS	American Welding Society
FHA	Federal Highway Administration
EPA	Environmental Protection Agency
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation
OSHA	Occupational Safety and Health Administration
STI	Steel Tank Institute
UL	Underwriters Laboratories Inc.
WDNR	State of Wisconsin Department of Natural Resources
WISDOT	State of Wisconsin Department of Transportation

#### **1.05 REFERENCED DOCUMENTS**

- A. Where reference is made to the "SSHSC", it shall mean the pertinent sections of the State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, current edition, and all supplemental and interim supplemental specifications. Where reference is made to the "SSSWC", it shall mean pertinent sections of the Standard Specifications for Sewer and Water Construction in Wisconsin, current edition. Where reference is made to the "Technical Standards", it shall mean the Wisconsin DNR Technical Standards current edition as published by the WDNR. Method of measurement and basis of payment sections in referenced documents shall not apply.

#### **1.06 QUALITY ASSURANCE**

- A. Provide materials and products as required by individual specification sections. Refer to Section GC - General Conditions of the Contract regarding substitutions.
- B. Provide quality assurance testing and reporting as required by individual specification sections.

#### **1.07 SAFETY**

- A. Contractor is solely responsible for worksite safety.
- B. Perform all work in accordance with applicable OSHA, state and local safety standards.
- C. Contact Diggers Hotline at 1-800-242-8511 in accordance with statutory requirements. Request that non-member utilities and private utilities be located by the appropriate parties.
- D. Coordinate with owner and have private lines on-site to locate all private (non-public) utilities.

#### **1.08 PERMITS**

- A. Unless otherwise noted in the Contract Documents, Contractor shall be responsible for obtaining and paying for all permits and testing necessary to complete the work.
- B. Municipal occupancy permits may be required, contractor to coordinate and pay for.

#### **1.09 CONSTRUCTION LIMITS**

- A. Construction Limits are generally confined to the property boundary as indicated on the drawings. In the absence of such a designation on the drawings, confine work to the minimum area reasonably necessary to undertake the work as determined by the Construction Representative. In no case shall construction activities extend beyond state property lines or construction easements.
- B. The Contractor shall restore all disturbed areas in accordance with the drawings and specifications. If plans and specifications do not address restoration of specific areas, these areas will be restored to pre-construction conditions as approved by the Construction Representative.

#### **1.10 SUBMITTALS**

- A. Refer also to General Conditions of the Contract and Division 01.
- B. Submit manufacturer's shop drawings, product data, samples, substitutions and operation and maintenance (O&M) data for approval as required by individual specification sections.
- C. Unless otherwise noted in 31 00 50 - Civil General Requirements, provide 3 copies of each submittal. Submit to project Architect/Engineer unless otherwise directed by the Construction Representative at the Pre-Construction Meeting.

#### **1.11 OFF SITE STORAGE**

- A. In general, the payments for materials stored off site will only be considered in instances where there is limited space available for storage on the site. Prior to bidding approval by the Construction Representative, together with the execution of a Storage Agreement will be required.

#### **1.12 CODES**

- A. Comply with the requirements of all applicable, local, state and federal codes.

#### **1.13 CERTIFICATIONS AND INSPECTIONS**

- A. Obtain and pay for all required sampling, testing, inspections, and certifications except those expressly listed as provided by the Architect/Engineer or other third party in the Contract Documents. Deliver originals of certificates and documents to the Construction Representative within 3 days; provide copies to the Architect/Engineer. Include copies of the certifications and documents in the O&M Manual.

#### **1.14 OPERATIONS AND MAINTENANCE DATA**

- A. All operations and maintenance data shall comply with the submission and content requirements specified under section General Requirements and Section 31 00 05 – Civil General Requirements.
- B. In addition to the general content specified under “General Requirements”, supply the following additional documentation:
  - 1. Architect/Engineer and commissioning provider to define detailed operation and maintenance data requirements for equipment specifications added to this section.

#### **1.15 PAVEMENT REMOVAL AND REPLACEMENT**

- A. Pavement removal and replacement for utility installations shall conform to section 32 05 00 – Common Work Results for Exterior Improvements. The roadway or pavement section shall be replaced to match the existing section (material and thickness) or the Municipality's minimum roadway section (whichever is greater). Parking lot areas disturbed shall follow the proposed pavement details.

### **PART 2 – MATERIALS**

#### **2.01 BARRICADES, SIGNS, AND WARNING DEVICES**

- A. Traffic barricades, traffic signs, and warning devices shall meet the requirements of applicable OSHA standards and the FHA Manual of Uniform Traffic Control Devices (MUTCD).

#### **2.02 TEMPORARY PLASTIC BARRIER FENCING**

- A. UV stabilized high-density polyethylene barrier fence free of holes tears and other defects. Provide 4' tall fence in diamond or rectangular pattern. Fencing shall be “safety orange” color, unless otherwise noted.

- B. Posts for temporary plastic barrier fencing shall be 5' tall, minimum 12 gauge, painted metal posts.

### **PART 3 - EXECUTION**

#### **3.01 MAINTENANCE OF SITE AND BUILDING ACCESS/EGRESS**

- A. Unless otherwise shown or directed, maintain existing access and egress to the facility throughout construction. Maintain ANSI A117 compliant access for disabled persons, delivery access, emergency vehicle access, and emergency egress. Do not interrupt access and egress without prior written approval from the Construction Representative.
- B. During utility installation, it is critical that a minimum of one lane of traffic be allowed to enter and exit the site at ALL TIMES.

#### **3.02 CONTINUITY OF EXISTING TRAFFIC/PARKING AND TRAFFIC CONTROL**

- A. Refer also to Section GR – General Requirements
- B. Do not interrupt or change existing traffic, delivery, or parking without prior written approval from the Construction Representative. When interruption is required, coordinate schedule with the Owner agency to minimize disruptions. When working in public right-of-way, obtain all necessary approvals and permits from applicable municipalities and WISDOT.
- C. When Contractor's activities impede or obstruct traffic flow, Contractor shall provide traffic control devices, signs and flaggers in accordance with other Contract Documents and the current version of the MUTCD, or as shown on the Drawings.

#### **3.03 PROTECTION AND CONTINUITY OF EXISTING UTILITIES**

- A. Verify the locations of any water, drainage, gas, sewer, electric, drainage, gas, sewer, electric, telephone/communication, fuel, steam lines or other utilities and site features which may be encountered in any excavations or other site work. All lines shall be properly underpinned and supported to avoid disruption of service.
- B. Do not interrupt or change existing utilities without prior written approval from the Construction Representative, affected utilities and users. Notify all users impacted by outages a minimum of 48 hours in advance of outage. Notification shall be provided in writing and describe the nature and duration of outages and provide the name and number of Contractor's foreman or other contact.
- C. Any service connections encountered which are not to be re-used shall be cut off at the limits of the excavation and capped in accordance with the requirements of applicable codes and any specifications governing such removals. In addition, the services shall be abandoned at the main per the demolition specifications and plans.

#### **3.04 PROTECTION OF EXISTING WORK AND FACILITIES**

- A. Verify the locations of, and protect, any signs, paved surfaces, buildings, structures, landscaping, streetlights, utilities, and all other such facilities that may be encountered or interfered with during the progress of the work. Take measures necessary to safeguard all existing work and facilities that are outside the limits of the work or items that are within the construction limits but are intended to remain. Report any damage to existing facilities to the Construction Representative immediately. Correct and pay for all damages.

#### **3.05 STORMWATER/EXCAVATION WATER MANAGEMENT**

- A. Control grading around structures, pitch ground to prevent water running into excavated areas.
- B. Pits, trenches within building lines and other excavations shall be maintained free of water.
- C. Provide trenching, pumping, other facilities required.

- D. Notify Architect/Engineer if springs or running water are encountered in excavation; provide discharge by trenches, drains, pumping to point outside of excavation. Provide information to Architect/Engineer of points and areas that water will be discharged. At the Engineer's option, the Contractor shall drain the spring to the storm sewer system by the use of field tile.
- E. Be responsible for control measures to prevent damage from flooding, erosion, and sedimentation to on-site and off-site areas.

### **3.06 FROST AND FREEZING PROTECTION**

- A. Frost protection for all buried utilities carrying a liquid (e.g. storm sewer, sanitary sewer, watermain, etc.) shall be protected with insulation per Commerce Code 82.30. It is the Installing Contractor's obligation to ensure the pipe is insulated adequately in areas of potential low cover.
- B. All utilities buried with less than 6 feet of cover shall be reviewed for insulation by the Installing Contractor per Wisconsin Department of Safety and Professional Services SPS 382.30 Code.
- C. Insulation type, thickness, required width, and installation method shall meet the requirements DSPS 382.30.

### **3.07 CLAY TRENCH DAM – UTILITY TRENCHES**

- A. A 2' thick clay trench dam shall be installed on all building utility connections for Storm, Water, and Sanitary.
- B. Clay trench dam shall be installed along utility line approximately 10' from building connection. Clay shall extend the entire trench cross section, from bottom of trench up to the subgrade level. Compact clay to 90% modified proctor.
- C. Clay material shall have same level (or less) of permeability as a pond liner ( $1 \times 10^{-7}$  cm/sec).

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

## SECTION 33 11 00

### WATER UTILITY DISTRIBUTION PIPING

#### **PART 1 – GENERAL**

##### **1.01 SCOPE**

- A. The work under this section shall consist of providing all work, materials, labor, equipment, and supervision necessary to provide water distribution system components and other work, as required in these specifications, on the drawings and as otherwise deemed necessary to complete the work. Included are the following topics:

##### **PART 1 - GENERAL**

Scope  
Related Work  
Reference  
Reference Standards  
Submittals  
Quality Assurance  
Permits/Fees  
Provisions for Future Work  
Survey and Staking  
Record Drawings

##### **PART 2 - MATERIALS**

Ductile Iron Watermain  
PVC Watermain  
Ductile Iron Watermain Fittings  
Valves  
Valve Boxes  
Hydrants  
Joint Restraints  
Polyethylene Encasement Bag  
Board Insulation  
Locator Tape  
Tracer Wire (For All Non-Metallic Water Pipe)  
Chlorine  
Pipe Joint Lubricant

##### **PART 3 - EXECUTION**

General  
Continuity of Existing Water Distribution System  
Connection to Existing Watermains/Tapping  
Bedding and Initial Cover  
Laying Watermain  
Installing Fittings, Valves and Hydrants  
Joint Restraint  
Installation of Copper Water Services and Brass Fittings  
Tracer Wire (For All Non-Metallic Water Pipe)  
Filling Watermain  
Testing and Disinfection

##### **1.02 RELATED WORK**

- A. Applicable provisions of Division 01 shall govern all work under this Section.

Section 31 25 00	Erosion Control
Section 31 05 00	Common Work Results for Earthwork (Outside Building Footprint)
Section 31 23 16.13	Trenching
Section 33 05 00	Common Work Results for Utilities

### 1.03 REFERENCE

- A. Applicable provisions of Division 01 shall govern work under this section.

### 1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
- |                     |  |
|---------------------|--|
| B88                 | Standard Specifications for Seamless Copper Water Tube   |
| F477                | Standard Specifications for Elastomeric Gaskets for Joining Plastic Pipe   |
| D3139               | Standard Specifications for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals                                       |
| D3350               | Standard Specifications for Polyethylene Plastic Pipe and Fittings   |
| C104/ANSI A21.4-95  | Materials American Water Works Association (AWWA):<br>Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water |
| C105/ANSI A21.5-99  | Standard for Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids   |
| C111/ANSI A21.11-00 | Standard for Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings  |
| C151/ANSI A21.51-02 | Standard for Ductile Iron Pipe, Centrifugally Cast for Water or Other Liquids  |
| C153/ANSI A21.53-00 | Standard for Ductile Iron Compact Fittings for Water or Other Liquids  |
| C502-94             | Dry Barrel Fire Hydrants   |
| C504-00             | Rubber-Seated Butterfly Valves   |
| C509-01             | Resilient-Seated Gate Valves for Water Supply Service  |
| C515-01             | Reduced Wall, Resilient Seated Gate Valves for Water Supply Service  |
| C550-01             | Protective Epoxy Interior Coatings for Valves and Hydrants   |
| C800-01             | Underground Service Line Valves and Fittings   |
| C900-97             | Polyvinyl Chloride Pressure Pipe, and Fabricated Fittings for Water Distribution (4"-12")  |
| C905-97             | Polyvinyl Chloride Pressure Pipe, and Fabricated Fittings for Water Distribution (14"-48")   |
| C906-99             | Polyethylene Pressure Pipe, and Fabricated Fittings for Water Distribution (4"-63")  |

### 1.05 SUBMITTALS

- A. Provide Manufacturers product information (cut sheets) and O&M information for watermain materials as indicated in Section 31 00 05 – Civil General Requirements, including:
1. Pipe
  2. Fittings
  3. Valves
  4. Hydrants
  5. Joint Restraint Materials
- B. Provide reports that document pressure and continuity testing procedures and results.
- C. Provide reports that document safe sample collection procedures and results.
- D. Provide copies of record drawings.

### 1.06 QUALITY ASSURANCE

- A. Maintain and submit record drawings.
- B. Conduct pressure testing, continuity testing and safe sampling as required in Part 3 – Execution.

### 1.07 PERMITS/FEES



- A. Contractor shall be solely responsible for obtaining all permits necessary to complete the work. Contractor shall pay all fees associated with obtaining permits. These include, but are not limited to permits for work within public right-of-way, street opening permits, utility connection permits, and plumbing permits.

#### **1.08 PROVISIONS FOR FUTURE WORK**

- A. Construct watermain system in a manner that will facilitate future extension or connection.
- B. Review plans prior to installation, and notify Construction Representative if proposed design does not appear to accommodate future extension or connection.
- C. Unless otherwise shown on the plans provide valves on "dead end" mains that will allow dry connection to the watermain system. Terminate "dead end" mains with full length of pipe beyond the valve, and a ell end with restrained plug.

#### **1.09 SURVEY AND STAKING**

- A. Surveyor will provide benchmarks or control points for the project.
- B. Contractor shall be responsible for transferring bench marks, control points, lines and grades necessary to complete his work.

#### **1.10 RECORD DRAWINGS**

- A. Maintain record drawings that show the actual locations, sizes and types of utilities and other features encountered.
- B. Note any modifications to proposed watermain size, alignment, or grades. Record any other deviations from the original design.

### **PART 2 – MATERIALS**

#### **2.01 DUCTILE IRON WATERMAIN**

- A. Centrifugally cast, cement mortar lined ductile iron watermain meeting the requirements of ANSI/AWWA C151/A21.51 and ANSI/AWWA C104/A21.4.
- B. Unless otherwise specified, ductile watermain shall be Class 52 as defined by ANSI/AWWA C151/A21.51.
- C. Ductile iron watermain joints shall be rubber gasket push-on joint or mechanical joint meeting the requirements of ANSI/AWWA C111/A21.11.
- D. Pipe shall be provided with conductive bonding straps to provide electrical continuity.
- E. Pipe shall be manufactured in the United States.

#### **2.02 PVC WATERMAIN**

- A. Polyvinyl chloride pipe conforming to the requirements of AWWA C900 (4"-12") or AWWA C905 (14"-48"). Unless otherwise noted, PVC watermain pipe shall have a dimension ratio (DR) of 18 or less. Pipe shall meet applicable NSF standards for use in a potable water distribution system.
- B. PVC watermain joints shall be rubber gasket push-on joint conforming to ASTM D 3139, using a gasket that conforms to ASTM F477.

#### **2.05 DUCTILE IRON WATERMAIN FITTINGS**

- A. Cement mortar lined mechanical joint fittings. Fittings shall be compact style fittings meeting the requirements of ANSI/AWWA C153/A21.53

- B. Fittings shall be manufactured in the United States.

## **2.06 VALVES**

A. Resilient Wedge Gate Valve

1. Resilient seated wedge gate valve meeting the requirements of AWWA C509 and C515. Body, bonnet and gate shall be constructed of ductile iron. Bolts shall be stainless steel.
2. Interior and exterior surfaces of valve shall be provided with epoxy coating meeting the requirements of AWWA C550. Symmetrical wedge shall be completely encapsulated with resilient material.
3. Valve stem shall be non-rising bronze. Stem collar shall be provided with thrust bearings both above and below, that are protected by upper and lower O-ring seals.
4. Valve shall be left opening and be provided with standard 2" square operating nut.
5. Valve shall be provided with mechanical joint connections.
6. Mueller, Kennedy, US Pipe, American Flow Control, Clow, or approved equal.

B. Butterfly Valve

1. Rubber-seated butterfly valve meeting the requirements of AWWA C504, for Class 150B. Body and disc shall be constructed of ductile iron. Bolts shall be stainless steel. Disc shall be lens shaped.
2. Interior and exterior surfaces of valve shall be provided with epoxy coating meeting the requirements of AWWA C550. Disc shall be provided with a stainless steel disc edge.
3. Valve stem shall be stainless steel. Packing shall be permanent duty "chevron V-type" or "O-ring" type. Bearings shall be permanent, non-metallic, and self-lubricating.
4. Valve seat shall be a single piece of elastomeric material that is not penetrated by the valve shaft.
5. Provide manual operator that is suitable for underground service and includes a standard 2" square operating nut.
6. Valve shall be provided with mechanical joint connections.
7. Mueller/Henry, Pratt, Kennedy, or approved equal.

C. Tapping Valve

1. Resilient seated wedge gate tapping valve having 100% port, and meeting the requirements of AWWA C509 and C515. Body, bonnet and gate shall be constructed of ductile iron. Bolts shall be stainless steel.
2. Interior and exterior surfaces of valve shall be provided with epoxy coating meeting the requirements of AWWA C550. Symmetrical wedge shall be completely encapsulated with resilient material.
3. Valve stem shall be non-rising bronze. Stem collar shall be provided with thrust bearings both above and below which are protected by upper and lower O-ring seals.
4. Valve shall be left opening and be provided with standard 2" square operating nut.
5. Valve shall be provided with flange connection on inlet side of valve and mechanical joint connections on outlet side of valve.
6. Provide suitable companion tapping sleeve.
7. Mueller, US Pipe, American Flow Control, Clow, or approved equal.

## **2.08 VALVE BOXES**

A. Gate/Butterfly Valve Boxes

1. Valve boxes shall be 5 1/4", cast iron valve boxes. Boxes shall be threaded, three-piece design with stay-put "WATER" cover. Provide appropriately sized bonnet.
2. Provide valve box extensions as necessary to accommodate depth of cover shown on plans or 6.5' minimum.
3. Valve boxes shall be Tyler or approved equal.

B. Curb Stop Boxes

1. Curb stop boxes shall be 1 1/4" minimum diameter, cast iron, arch style, valve boxes. Boxes shall be telescopic, extendable to accommodate 7' bury. Lid shall be two piece threaded, with a plug having a pentagonal bolt for removal.
2. Provide valve box extensions as necessary to accommodate depth of cover shown on plans or 6.5' minimum.

3. Ford, Mueller, or approved equal.

## **2.09 HYDRANTS**

- A. Fire hydrants shall be dry-bury type meeting the requirements of AWWA C502.
- B. Hydrants shall be ductile iron, 250 psi rated working pressure.
- C. Hydrants shall be traffic rated and provided with breakaway feature.
- D. Hydrants shall be provided with the following features:
  1. 7' bury (6.5' cover over lead)
  2. 6" mechanical joint inlet
  3. 5 1/4" main valve opening
  4. One (1) 4 1/2" pumper nozzle with National Standard Threads
  5. Two (2) 2 1/2" hose nozzles with National Standard Threads
  6. Nozzle caps with chains
  7. 1 1/2" operating nut, open left
  8. Painted Red
- E. Hydrant type shall match City of Janesville requirements
- F. Valves for hydrants shall be directly attached to the mechanical joint anchoring tees.
- G. Hydrants shall be set to provide for a 21 inch clearance from the ground to the centerline of the nozzles.

## **2.10 JOINT RESTRAINTS**

- A. Retainer Glands for Ductile Iron Pipe
  1. Wedge action retainer glands designed for use with ductile iron pipe.
  2. Glands shall be constructed of ductile iron. Restraint shall be provided by a minimum of three wedges which are tightened onto the exterior of the pipe using a threaded, torque limiting mechanism.
  3. Glands shall be tested to provide restraint at 250 psi operating pressure.
  4. Retainer glands shall be MEGA-LUG by EBAA Iron, or approved equal.
- B. Retainer Glands for PVC Pipe
  1. Wedge action retainer glands designed for use with PVC pipe.
  2. Glands shall be constructed of ductile iron. Restraint shall be provided by a minimum of four (4) wedges which are tightened onto the exterior of the pipe using a threaded, torque limiting mechanism.
  3. Glands shall be tested to provide restraint at 200 psi operating pressure.
  4. Retainer glands shall be MEGA-LUG by EBAA Iron or approved equal.
- C. Watermain Clamps
  1. Steel clamps specifically fabricated for use in pipe restraint systems. Watermain clamps shall be selected based on size of the main.
  2. Watermain clamps shall be constructed of flat steel stock, 1/2" thick x 2" wide minimum dimensions.
  3. Astral or approved equal
- D. Watermain Clamp Hardware
  1. Corrosion resistant steel hardware specifically fabricated for use in pipe restraint systems.
  2. Astral, or approved equal.
- E. Threaded Rod for Joint Restraint
  1. 3/4" diameter, threaded rod. Rod shall be constructed of carbon steel having a minimum tensile strength of 30 ksi. Rod shall be zinc plated.

## **2.11 POLYETHYLENE ENCASUREMENT BAG**

- A. All ductile iron pipe, including mains, valves, fittings, ductile iron services, hydrant leads, and hydrant risers shall be encased in 8 mil polyethylene installed in accordance with recommendations of the Ductile Iron Pipe Research Association (DIPRA). The polyethylene shall be lapped and taped sufficiently to prevent the soil from coming in contact with the pipe. Care shall be taken in backfilling to prevent tearing or puncturing of the polyethylene encasement.
- B. Encasement bag shall meet the requirements of ANSI/AWWA C105/A21.5

## **2.12 BOARD INSULATION**

- A. Rigid, closed-cell, extruded polystyrene insulation. Insulation shall be suitable for buried installation.
- B. Individual boards shall have minimum dimensions of 8'x4'x2".
- C. Insulation shall follow the requirements of Wisconsin Department of Safety and Professional Services Administrative Code SPS 382.
- D. Dow Styrofoam or approved equal.

## **2.13 LOCATOR TAPE**

- A. Detectable metallic locator tape, specifically manufactured for marking utilities.
- B. Tape shall be a minimum of 6" wide and designed to be detectable at a depth of 18".
- C. Tape shall be marked "WATER" and blue colored.

## **2.14 TRACER WIRE (FOR ALL NON-METALLIC WATER PIPE)**

- A. Tracer wire shall be a minimum of 10 gauge, insulated, single-conductor copper wire or equivalent.
- B. Tracer wire insulation color for watermain (non-metallic) shall be blue.
- C. As an alternative to the tracer wire, GPS data shall be recorded with the municipality where the non-metallic pipe is located.

## **2.15 CHLORINE**

- A. Calcium hypochlorite tablets or granules. Calcium hypochlorite product shall meet all applicable AWWA and NSF standards for use as watermain disinfectant.
- B. Arch "HTH" or approved equal.

## **2.16 PIPE JOINT LUBRICANT**

- A. Petroleum free pipe lubricant formulated for use with potable water systems. Product shall meet the requirements of ANSI/NSF Standard #61.

# **PART 3 - EXECUTION**

## **3.01 GENERAL**

- A. Complete exploratory excavations at utility crossings as shown on the plans and as necessary to complete the work.
- B. Maintain clearances between watermains and existing or proposed sewer lines as follows:
  - 1. 8' horizontal separation (measured center to center) between watermains and existing or proposed sanitary or storm sewers.
  - 2. 6" vertical separation (measured from outsides of pipes) where watermains cross over sanitary or storm sewers.

3. 18" vertical separation (measured from outsides of pipes) where watermain cross under sanitary or storm sewers.
- C. Notify the construction Representative of utility conflicts as soon as they are encountered.
- D. Store and handle pipe in accordance with Manufacturer's recommendations. Keep pipes clean of soil, debris, and animals.

### **3.02 CONTINUITY OF EXISTING WATER DISTRIBUTION SYSTEM**

- A. Provide a construction schedule to Construction Representative, municipal water utility (if applicable) and local fire department (if applicable) for review and approval prior to starting construction. Schedule shall indicate the date and time of all required water supply interruptions.
- B. Do not interrupt existing water supply without approval from Construction Representative, municipal water utility, and local fire department.
- C. Once approved, notify all distribution system users impacted by outages a minimum of 48 hours in advance of outage. Notification shall be provided in writing and describe the nature and duration of outages, and provide the name and number of Contractor's foreman or other contact.
- D. Watermain construction shall be completed in a manner that minimizes interruptions to existing services.

### **3.03 CONNECTIONS TO EXISTING WATERMAINS/TAPPING**

- A. Connect to existing watermain at the locations shown on the plans. Unless otherwise shown on the plans, connections shall be made by "live tapping" the main. Contractor shall provide all materials and labor required to complete the "live tap".
- B. Provide tapping sleeves, valves, cutting-in sleeves and other materials specifically manufactured for use with the type of pipe to which the connection is being made.
- C. Notify the Construction Representative if the proposed point of connection is located within 4' of an existing joint.
- D. Whenever possible, connections shall be made at existing pipe stubs, valves or other fittings.
- E. When connecting to existing mains, locate the proposed valve as close to the existing main as possible. Swab the interior surfaces of all pipe, fittings, valves that will be exposed to the existing system. Swab solution shall consist of a 5% (by weight) solution of calcium hypochlorite.

### **3.04 BEDDING AND INITIAL COVER**

- A. Provide bedding and initial cover in accordance with the applicable requirements of Section 31 23 16.13 – Trenching.
- B. Watermain and water service piping shall be provided with 4" of bedding material and 12" of initial cover material (both measured at the bell of the pipe).
- C. Bedding and cover material for various types of pipe shall consist of the following:
  1. Ductile Iron Watermain: Bedding sand or crushed stone screenings.
  2. PVC Watermain: Crushed stone bedding.
  3. Copper Water Services: Bedding sand or crushed stone screenings.
- D. Backfill within paved areas of R.O.W. shall consist of aggregate slurry or mechanically compacted, crushed concrete meeting the gradation requirements for granular material as specified in table 37 (section 8.43.4) of the Standard Specifications for Sewer and Water Construction in the State of Wisconsin – Latest Edition, hereafter referred to as "Standard Specifications" in this spec section.

### **3.05 LAYING WATERMAIN**

- A. Install watermain at locations and depths shown on the plans. Install locator tape per manufacturer's recommendations.
- B. Provide a minimum of 6.0' of cover over watermain, unless otherwise shown on the drawings or directed by the Construction Representative. For watermain with less than 6.0' of cover, provide insulation as shown on the drawings, or as required by Commerce Plumbing Code 82.30.
- C. Check watermain grades regularly using rotating level or other accurate method. Lay watermain at uniform grades between deflection points shown on the plans; do not install watermain with intermediate high points.
- D. Unless otherwise shown or approved by the Construction Representative, lay pipe with bell end facing the direction of pipe laying.
- E. For ductile iron watermain, place polyethylene encasement bag on watermain prior to lowering into trench. Once pipe is joined, pull bag over entire length of pipe, overlap joint at adjacent pipe and secure using "Duct" tape or other approved method.
- F. Prepare pipe bell and gasket in accordance with Manufacturer's requirements. Lubricate bell and/or pipe with AWWA/NSF approved lubricant.
- G. Push pipe home in accordance with manufacturer's recommendations regarding tools and methods.
- H. Pipe joint deflection shall not exceed Manufacturer's requirements.
- I. For ductile iron pipe, connect bonding straps or lugs to provide electrical continuity along entire watermain. Provide exothermic weld to attach new bonding straps, when existing straps are missing or damaged. Follow manufacturer's requirements for exothermic welding procedures.
- J. Disinfect pipe by placing calcium hypochlorite in each section of pipe as pipe laying progresses. Provide dosage as indicated on Table 33 11 00 - 1.

<b>Table 33 11 00 - 1</b>	
<b>Watermain Nominal Diameter (inches)</b>	<b>Dose Calcium Hypochlorite* (oz/length pipe)</b>
4-6	1
8	3
10	5
12	7

\*Granular/tablet calcium hypochlorite with 68% (weight) available chlorine Table 33 11 00 – 1.

- K. When required per Commerce Code, provide insulation in the thickness and width shown on the drawings. Unless otherwise shown, insulation shall be provided at a minimum thickness of 2".
- L. Install insulation on compacted initial cover material 6" above the top of pipe. Stagger joints when placing multiple layers of insulation.
- M. Provide insulation with a minimum of 1' of initial cover material. Place backfill material in manner that does not damage insulation; replace damaged insulation.
- N. Mark the location of dead-end mains with an 8' long 4x4 timber and steel "U" fence post.

### **3.06 INSTALLING FITTINGS, VALVES AND HYDRANTS**

- A. Install fittings, valves and hydrants at locations shown on the drawings.
- B. Unless otherwise shown, provide mechanical joint connections. Install materials in accordance with manufacturer's recommendations.

- C. Maintain electrical continuity through all fittings, valves and hydrants. Provide and install suitable jumper cables for epoxy coated valves.
- D. Place hydrants and valves on 4"x8"x16" solid concrete masonry units set on compacted soil.
- E. Install joint restraints in accordance with the requirements of this section.
- F. Install valve box so that bonnet rests on compacted initial backfill material at the same elevation as the top of the valve stuffing box. Center the valve box over the valve nut.
- G. Install valve box plumb and level, backfilling evenly. Extend valve box to proposed final grade; provide valve box extensions as necessary. Valve boxes that shift during backfilling or restoration shall be excavated and reset.
- H. Mark all valve boxes with a steel "U" fence post to protect them from damage.
- I. Install hydrants at elevation shown on plans or as required to provide a minimum of 6.5' cover over the hydrant lead.
- J. Place approximately ½ cy of clear stone bedding material from the base of the hydrant to 6" above the drain holes on the hydrant elbow. Cover clear stone material with a "skirt" of polyethylene encasement bag material to prevent backfill material from migrating into the clear stone.
- K. Install hydrant plumb and level, backfilling all sides evenly.
- L. Cover all new hydrants with a plastic garbage bag or similar cover until the main has been filled and placed in service.

### **3.07 JOINT RESTRAINT**

- A. Unless otherwise noted, all fittings (bends, tees, crosses, caps, etc.), valves and hydrants shall be installed with restrained joints. Additionally, branch runs of pipe shall be installed with restrained joints beginning at the fitting at the main to the first valve.
- B. Hydrant leads shall provide with restrained joints beginning at the fitting at the main to the hydrant.
- C. Joint restraint shall be provided using retainer glands.
- D. If approved by the Construction Representative, watermain clamps and threaded rod may be used as an alternative means of joint restraint.
- E. Install all joint restraint products in accordance with Manufacturer's recommendations and drawings.
- F. If approved for use, watermain clamps, threaded rod, and associated hardware shall be fully encased in polyethylene encasement bag.

### **3.08 INSTALLATION OF COPPER WATER SERVICES AND BRASS FITTINGS**

- A. Connect copper water service piping to watermain, wellhouse, or other supply as shown on the drawings.
- B. Watermain taps shall be made under pressure using a tapping machine specifically designed to tap and install corporation stops. Dry watermain taps are not allowed.
- C. Service saddles shall installed on services where the corporation stop is 1 ½" nominal diameter or greater.
- D. Provide a horizontal offset adjacent to the main for all copper services. Comply with pipe manufacturer's requirements with respect to minimum radius on bends.

- E. Install curb stops as shown on the drawings. If specific curb stop location is not shown on the plans, consult with Construction Representative to determine acceptable location prior to installing.
- F. Place curb stop box on a 4"x8"x8" solid concrete masonry unit set on compacted ground. Orient box so that no portion of the box bears on the water service or curb stop.
- G. Install curb stop box plumb and level, backfilling evenly. Extend curb stop box to proposed final grade; provide extensions as necessary. Curb stop boxes that shift during backfilling or restoration shall be excavated and re-set.
- H. Mark all curb stop boxes with a steel "U" fence post to protect them from damage.
- I. Install copper water service as shown on the drawings. Limit the number of water service joints, using full lengths of pipe whenever possible.
- J. Prepare copper pipe joints in accordance with pipe and fitting manufacturer recommendations. Cut pipe squarely, remove burs and round ends as necessary.
- K. Install fittings in accordance with manufacturer's recommendations. Torque compression connections to recommended tightness; do not over-tighten compression joints.
- L. Provide dead-end copper water services with compression connectors fitted with plugs. Do not tap the ends of copper water services shut. Mark the location of dead-end services with an 8' long 4x4 timber and steel "U" fence post.

### **3.09 TRACER WIRE (FOR ALL NON-METALLIC WATER PIPE)**

- A. Tracer wire shall be installed in accordance with all the following:
  - 1. Tracer wire shall be installed along the length of the non-metallic pipe.
  - 2. Tracer wire shall be located directly above and within 6" of the non-metallic pipe.
  - 3. Exterior access locations shall include a means of protecting the tracer wire.
  - 4. In ground sleeves shall be provided in accordance with COMM. Code 82.35.
  - 5. Tracer wire conductivity shall be tested prior to use.
  - 6. Conductor warning tape may not be utilized in lieu of tracer wire.

### **3.10 FILLING WATERMAIN**

- A. Fill watermain after main has been installed and completely backfilled.
- B. Fill main slowly to limit entrapped air and evenly distribute calcium hypochlorite. Open all hydrants completely to allow air to escape and monitor filling.
- C. Once main is full, allow a minimum of 48 hour time for disinfection to occur before flushing.

### **3.11 TESTING AND DISINFECTION**

- A. Prior to filling and flushing new mains, Contractor shall backfill the trench to its full depth. All bends and special connections to the main shall be adequately restrained prior to filling. Any damage caused to the water main or its appurtenances during disinfection or testing shall be corrected by Contractor at his expense.
- B. Contractor shall be responsible for notifying the municipal Water Utility 24 hours in advance of need for filling and flushing main. Contractor shall make provisions to de-chlorinate flush water and stabilize splash zones from erosion.
- C. Water Main Disinfection: Contractor shall furnish all material, equipment and labor necessary to disinfect all new water mains and all existing mains disturbed by construction in accordance with AWWA C651. Sampling and testing will be completed by the City. Contractor shall schedule this work to be completed within the Contract Times. Items of material for testing shall be furnished in the size and quantity necessary to properly complete the test. Interruption or delay of Contractor's work progress caused by testing and sampling shall not be cause for extra payment under the Contract nor shall it be cause for extension of Contract Time. Costs for items furnished under this



section shall be included as incidental work under the various items included in the Bid. No water system improvements shall be put into service until safe samples have been confirmed. Contractor shall obtain all necessary permits for disposal of water flushed from new water mains.

- D. Contractor shall keep a record of all tests performed. These records shall show the individual lengths of main tested and test results.
- E. Where connections are made to existing mains for testing, it shall be the responsibility of Contractor to provide the necessary hydrostatic tests on all new mains installed. This may necessitate, but not limited to, the installation of temporary valves to isolate the new system from the existing system. All materials, work, and equipment necessary for this work shall be furnished by Contractor at his expense.
- F. Contractor shall apply a neutralizing chemical to the flushing water to thoroughly neutralize the chlorine residual in the water.
- G. Water Main Testing:
  - 1. Leakage/Pressure Test: Contractor shall conduct hydrostatic pressure tests and leakage tests of all joints in accordance with the requirements of AWWA C600. During performance of the hydrostatic pressure and leakage test the main shall be subjected to a test pressure of 1-1/2 times normal static pressure (with a minimum pressure of 100 psi) for 2 hours. All air shall be removed from the water main prior to testing by flushing and by installing corporation at high points as necessary.
  - 2. Continuity Test:
    - a. All water mains shall be tested for continuity.
    - b. Contractor shall provide all materials, labor, and equipment necessary to perform continuity test on water main installed under this Contract. Test shall be performed in presence of Engineer.
    - c. Test segments shall be continuous between two fire hydrants. In areas where there are not hydrants available, test sections shall be between valves or other locations subject to approval of Engineer.
    - d. Contractor shall use an ohmmeter or continuity tester to verify that electrical continuity exists across all joints.
  - 3. In addition to the performance requirements noted here, Contractor shall conform to local jurisdictional agency requirements and comply with these as part of the scope of the work. Additional costs, tests, municipal observation trips and field reports, are part of the Contractor's scope of work and costs.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

## SECTION 33 30 00

### SANITARY SEWERAGE UTILITIES

#### **PART 1 – GENERAL**

##### **1.01 SCOPE**

- A. The work under this section shall consist of providing all work, materials, labor, equipment, and supervision necessary to provide for the sanitary sewer work required in these specifications and on the drawings. This specification shall apply to all sanitary sewer work beginning at a point five 5' outside of the building wall, unless otherwise specified. Included are the following topics:

##### PART 1 - GENERAL

- Scope
- Related Work
- Reference
- Reference Standards
- Submittals
- Provisions for Future Work
- Record Drawings

##### PART 2 - MATERIALS

- General
- Pipe
- PVC Pipe
- Connections for Dissimilar Pipe Materials
- Manholes
- Castings
- Manhole Chimney Seal
- Pipe Insulation
- Locator Tape
- Tracer Wire

##### PART 3 - EXECUTION

- Notification
- Bypass Pumping
- Bypass Plan
- Laying Pipe
- Bedding/Initial Cover
- Manholes
- Casting Installation
- Connections to Existing Structures
- Sewer Laterals
- Pipe Insulation
- Locator Tape
- Tracer Wire
- Deflection Testing
- Leakage Testing
- Sewer Televising
- Abandon Sewer

##### **1.02 RELATED WORK**

Section 31 05 00	Common Work Results for Earthwork (Outside Building Footprint)
Section 31 25 00	Erosion Control
Section 31 23 16.13	Trenching
Section 33 05 00	Common Work Results for Utilities

##### **1.03 REFERENCE**

- A. Applicable provisions of Division 1 shall govern all work under this section.

#### 1.04 REFERENCE STANDARDS

- A. Where these specifications do not cover portions of the work to be undertaken, the Standard Specifications for Sewer and Water Construction in Wisconsin, current edition, shall govern the work, hereafter called "Standard Specifications" in this spec section.
- B. American Society for Testing and Materials (ASTM):
- |                   |  |
|-------------------|--|
| C425-04           | Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings   |
| C700-05           | Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated                            |
| D1784-03          | Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds |
| D2235-04          | Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings                |
| D2564-04          | Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems                            |
| D2680-01          | Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping      |
| D3034-04a         | Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings                                      |
| D3212-96a(2003)e1 | Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals                         |
| D3350-05          | Standard Specification for Polyethylene Plastics Pipe and Fittings Materials   |
| D4673-02          | Standard Classification System for Acrylonitrile-Butadiene-Styrene (ABS) Plastics and Alloys Molding and Extrusion Materials |
| F477-02e1         | Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe  |
| F679-03           | Standard Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings                |
- C. American Water Works Association (AWWA):
- |                    |  |
|--------------------|--|
| C104/ANSI A21.4-95 | Standard For Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water |
| C151/ANSIA21.53-00 | Standard for Ductile Iron Pipe, Centrifugally Cast for Water or Other Liquids  |
| C153/A21.53        | Standard for Ductile Iron Compact Fittings for Water Service                   |

#### 1.05 SUBMITTALS

- A. Provide manufacturer's product information (cut sheets), shop drawings and O&M information as indicated in Section 31 00 05 – Civil General Requirements for sewer materials including:
1. Pipe
  2. Fittings
  3. Structures
  4. Castings
- B. Provide reports documenting pressure testing, mandreling, and televising.
- C. Provide copies of record drawings.

#### 1.06 PROVISIONS FOR FUTURE WORK

- A. Construct sewer system in a manner that will facilitate future extension or connection.
- B. Review plans prior to installation and notify Construction Representative if proposed design does not appear to accommodate future extension or connection.
- C. When drawings indicate future connection at a manhole or other structure, install a full length of pipe beyond the structure, providing plugged bell at terminal end of pipe. Provide marker board at terminal end of stubbed pipe.

#### 1.07 RECORD DRAWINGS

- A. Refer to Section GR - General Requirements.
- B. Maintain record drawings that show the actual locations, sizes, and types of utilities and other features encountered.
- C. Note any modifications to proposed sewer system size, location, or elevation. Record any other deviations from the drawings.

## **PART 2 - MATERIALS**

### **2.01 GENERAL**

- A. Conform all materials to the size and type shown on the plans or as called for in the specifications and to applicable Laws, Codes, and Ordinances.
- B. All products and materials are to be new, undamaged, clean, and in good condition. Existing products and materials are not to be reused unless specifically indicated.
- C. Be responsible for the safe storage and handling of all materials utilized in the work. Store all materials in areas designated by the Construction Representative in cooperation with the Owner.
- D. Perform all work in accordance with any applicable manufacturer's instructions.

### **2.02 PIPE**

- A. Provide the size, type and class/schedule of pipe as indicated on the drawings.
- B. Use only pipe supplied from the same manufacturer, and of the same type, unless otherwise specified or approved in advance by the Engineer.
- C. Only pipe, joints, material and installation approved by Wisconsin Department of Natural Resources and/or the Department of Commerce for the intended use in the State of Wisconsin shall be used.

### **2.03 PVC PIPE**

- A. Solid Wall PVC:
  - 1. Polyvinyl Chloride (PVC) pipe fittings shall meet the requirements for type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings of ASTM D3034 for pipe sizes up through 15 inches and ASTM F679 for pipe sizes 18 inches through 36 inches. All PVC sanitary sewer pipe shall have a maximum Standard Dimension Ratio (SDR) of **[35][26]**.
  - 2. The wall thickness shall conform to requirements for a T-1 wall per ASTM F69-01. PVC material shall have cell classification 12454-B or 12454-C as defined in ASTM D1784 with minimum modulus of elasticity of 400,000 psi in tension. Pipe stiffness shall be minimum 46 psi when tested in accordance with ASTM D2412.
  - 3. Acceptance of piping shall be subject to tests conducted by an approved testing agency.
  - 4. Pipe and fittings shall be the product of one manufacturer and the manufacturer shall have experience records substantiating acceptable performance of the pipe to be furnished.
  - 5. Fittings such as saddles, elbows, tees, wyes and others shall be of material and construction corresponding to and have a joint design compatible with the adjacent pipe. Approved adapters shall be provided for transitions to other types of pipe. Fittings shall be injection molded PVC.
  - 6. Joints shall be of the elastomeric type. Elastomeric joints shall be a bell and spigot joint conforming to ASTM D3212 sealed by a rubber gasket conforming to ASTM F477 so that the assembly will remain watertight under all conditions of service, including the movements resulting from the expansion, contraction, settlement and deformation of the pipe. Bells shall be formed integrally with the pipe and shall contain a factory installed positively restrained gasket.

### **2.04 CONNECTIONS FOR DISSIMILAR PIPE MATERIALS**

- A. Where new sewer connects to an existing dissimilar pipe, the connection shall be made with a no hub type coupling meeting the requirements of CISPI 310. Couplings shall have neoprene gaskets with stainless steel shield, and multiple stainless steel clamps with worm gear tightening device. The couplings shall be made specifically for the type and size of pipe materials being connected. Couplings shall be Fernco or approved equal.

## **2.05 MANHOLES**

- A. General
1. Provide precast concrete manholes. Concrete block or cast-in-place manholes may only be used after receiving written approval by the Construction Representative and the Engineer for customized manhole sizes and shapes.
  2. Submit manufacturer's preproduction (shop) drawings for approval prior to the start of manufacturing.
  3. Contractor shall carefully locate all pipe locations, sizes, orientation and elevation prior to ordering new manholes. For sewer re-lays, verify if each pipe encountered is active. In-active pipe shall not be connected to the new sewer.
- B. Precast Manhole Sections
1. Precast concrete manhole sections, including bottom and top, shall meet the requirements of ASTM C478.
  2. Unless otherwise noted, provide four 4' diameter manholes. If field conditions require a larger structure contact the Construction Representative or Engineer.
  3. For 4' diameter manholes, provide eccentric cone top sections with a minimum clear opening of 24 inches. Flat top slabs may be used on manholes greater than 4' in diameter.
  4. Manhole wall thickness shall be minimum of 5" for 4' diameter manholes, 6" for 5' diameter manholes and 7" for 6' and 7' diameter manholes.
  5. Manhole bottom section shall be pre-cast with integral base having a minimum thickness of 8" unless otherwise noted.
- C. Joints
1. Provide manhole riser and barrel sections, cones, and flat tops, with standard pipe section tongue and groove joints.
  2. Seal joints watertight with prefabricated rubber or plastic gaskets or formed in place butyl rubber seal.
  3. Joint sealers: Kent Seal, ConSeal, or approved equal.
- D. Connections
1. Openings for connections shall be cast-in-place or cored and appropriately sized for the type and size of pipe being connected.
  2. Provide flexible, watertight, pipe-to-manhole connections (or "boots") for sanitary sewers; Kor-N-Seal, Interpace, A-Lok, or approved equal.
- E. Manhole Steps
1. Provide steps at 16" O.C. and project approximately 6" from wall.
  2. Unless otherwise indicated on the drawings, locate manhole steps over the downstream pipe opening.
  3. Manhole steps shall be steel reinforced polypropylene with ½-inch diameter deformed reinforcing bar. Steps shall be permanently secured in the manhole wall. Manhole steps shall be American Step Company, M.A. Industries or approved equal.
- F. Bench and Flowline
1. Provide either pre-cast or cast-in-place bench and flowline.
  2. Unless otherwise indicated on the drawings, bench height shall be ¾ the diameter of the downstream pipe. Slope bench towards flowlines at a minimum ½" per foot. Provide light broom finish on bench.
  3. Flowlines shall be formed with gradual, uniform sweeps directed towards the downstream pipe. Provide smooth, troweled finish for flowlines.
  4. When cast-in-place benches and flowline are used, lay the sewer pipe through the manhole.
- G. Adjusting Rings

1. Fiber-reinforced pre-cast concrete adjusting rings meeting the requirements of ASTM C-478. Provide rings of 2" or 4" thickness.
2. Precompressed butyl gasket, 3/8"x3 1/2" shall be used between the top of the manhole and first adjustment ring and between all subsequent rings. Butyl material shall be E-Z Stick, or equal.

## **2.06 CASTINGS**

- A. General
  1. All manhole castings shall be heavy duty iron conforming to ASTM A48, Class 20 and rated for AASHTO H-20 loading. Provide water tight, gasketed, self-sealing, non-rocking lids with concealed pick hole.
- B. Frames and grates shall be as noted on the plans.

## **2.07 MANHOLE CHIMNEY SEAL**

- A. When indicated on the drawings, provide an internal frame/cone seal meeting requirements of Sections 8.42-8.42.5 of the Standard Specifications for Sewer and Water Construction in Wisconsin.

## **2.08 PIPE INSULATION**

- A. Rigid closed-cell extruded polystyrene insulation shall be suitable for buried insulation.
- B. Individual boards shall have dimensions of 8" x 4" x 2".
- C. Insulation shall follow the requirements of DSPS 382.
- D. Dow Styrofoam, or approved equal.

## **2.09 LOCATOR TAPE**

- A. Detectable metallic locator tape, specifically manufactured for marking utilities.
- B. Tape shall be a minimum of 6" wide and shall be marked "SEWER".

## **2.10 TRACER WIRE (FOR ALL NON-METALLIC SANITARY PIPE)**

- A. Tracer wire shall be a minimum of 10 gauge, insulated, single-conductor copper wire, or equivalent.
- B. Tracer wire insulation color for sanitary (non-metallic) shall be green.
- B. The locator wire shall be brought to the surface at the edge of the building and enclosed in a curb box with "SEWER" on the cover.
- C. As an alternative to the tracer wire, GPS data shall be recorded with the municipality where the non-metallic pipe is located.

## **PART 3 - EXECUTION**

### **3.01 NOTIFICATION**

- A. Contractor, prior to excavation work, shall notify all utilities, governmental agencies, or entities, known to, or which can reasonably be assumed to, have above or below ground pipe, conduit cables, structures or similar items within limits of project, to locate and mark location of such items. The Contractor shall expose potential pipe conflicts prior to installation of sewers to allow for any field changes to the design to be made.

### **3.02 BYPASS PUMPING**

- A. Unless otherwise noted, all tributary buildings and services will remain occupied during construction. Wastewater will continue to be discharged to the sanitary sewers during construction. Contractor shall provide, operate and maintain all diversion and bypass pumping equipment necessary to carry out the work and allow wastewater to be discharged. Provide all necessary generators or other power source necessary to operate pumps on a continuous basis. Extra pumping and power equipment shall be staged onsite to maintain bypass pumping in the event of failure of the primary bypass pumping equipment. The Contractor is solely responsible for wastewater bypassing.

### **3.03 BYPASS PLAN**

- A. Contractor shall provide a wastewater bypass pumping plan indicating the order and schedule for completion of the work and associated bypassing provisions. The plan shall indicate the location of proposed bypassing, discharge locations, and the type and size of pumping equipment to be used. The plan shall describe contingencies to be used in the event of failure of the primary bypass pumps. Contractor's by-passing plan is subject to Owner's approval prior to implementation.

### **3.04 LAYING PIPE**

- A. Install all pipe in accordance with ASTM specifications which pertain to the specified type of pipe material and the installation situation.
- B. Do not use any pipe or fittings cracked in cutting or handling or otherwise not free from defects.
- C. Clean all pipe of any dirt and/or debris both inside and out prior to placing in the trench.
- D. Make joints in accordance with manufacturer's directions with due care to avoid damaging pipe and/or disturbing previously laid pipe.
- E. Cut pipe only according to manufacturer's directions.
- F. Lay all sewer pipes to horizontal alignment and grade shown on the plans with bell ends up hill. Establish and maintain horizontal alignment using total station, transit or theodolite. Use pipe laser or level to establish and maintain grade of pipe. Discrepancies from the required horizontal alignment or grade at any location shall not be greater than 0.10' or 0.05', respectively.
- G. Do not exceed specified trench widths.

### **3.03 BEDDING/INITIAL COVER**

- A. Sanitary sewer and sewer services shall be provided with 4" of bedding material and 12" of initial cover material (both measured at the bell of the pipe).
- B. Crushed stone bedding shall be used for both bedding and initial cover.
- C. Backfill within paved areas of R.O.W. shall consist of aggregate slurry.
- D. Provide bedding and initial cover in accordance with applicable requirements of Section 31 23 16.13 – Trenching.

### **3.04 MANHOLES**

- A. Contractor shall determine the proper location, size, elevation, and orientation of all pipes entering new manholes before ordering. Do not connect abandoned pipes to new manholes. Manholes having improper location and/or orientation of the pipe connections will be rejected. Field repairs or adjustments of connection points are not permitted.
- B. Limit the excavation for manholes so as to provide only the necessary amount of space to sufficiently prepare the subgrade, set the base, set the manhole or structure, and lay pipe. Provide a minimum of 1' of clearance between structure and trench wall for adequate backfilling and compaction.



- C. Where excavation occurs below the bottom elevation of the structure's base, bring the excavation to the required elevation by the use of compacted crushed stone bedding. A minimum of 8 inches of compacted Crushed Stone Bedding shall be placed below manhole base.
- D. Set manhole base in accordance with elevation and location as indicated on the plans. Install base plumb and level. Install subsequent pre-cast manhole sections in accordance with shop drawing layout. Provide watertight gaskets between each manhole section.
- E. Pour inverts with smooth surface draining to downstream pipe. Where two or more lines meet at an angle, provide curved channel. Slope manhole bench at 2 inches/ft towards flow channel.
- F. Manholes shall be provided with between 4" and 8" of adjusting rings, with the top adjusting ring being 2" thick. Provide butyl sealant material between rings. Once rings are in place, tuck point the exterior joint and provide the entire exterior surface of the adjusting ring riser with a coating of mortar.
- G. When indicated on the drawings, the manhole frame shall be set with a Type I frame/chimney joint as specified in the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition. The frame and adjusting rings shall be sealed with an internal rubber sleeve as detailed in File 12A of the Standard Specifications.
- H. Drop manholes shall be constructed in accordance with File No. 19 of the Standard Specifications.

### **3.05 CASTING INSTALLATION**

- A. Install casting type as indicated on the plans or in the specifications. If the plans and specifications are in conflict, the plans shall govern.
- B. Provide butyl sealant material between last adjoining ring and casting base. Adjust casting elevation and slope to match adjacent proposed grades.

### **3.06 CONNECTIONS TO EXISTING STRUCTURES**

- A. Make all necessary openings into existing structures or sewers including the reconstruction of existing inverts or benches, as necessary. Patch all openings permanently watertight with concrete brick and mortar, or hydraulic cement and water stops, or for sanitary sewer, hydraulic cement and flexible water tight boots.

### **3.07 SEWER LATERALS**

- A. Connect existing sewer laterals in accordance with all of the requirements of the sewer mains, including bedding, backfill, compaction and jointing of the pipe. Connect sewer laterals to the sewer main by means of an approved "wye" fitting. Connect the new pipe to the existing lateral material using a no-hub coupling or approved transition fitting. Coupling/fitting shall be selected for the specific pipe material being connected.
- B. Subject to local municipality requirements, cut-in type saddle wyes are permitted on existing sanitary sewers where service laterals are to be connected to the sewer. Unless otherwise indicated, the saddle fitting shall be gasketed PVC with stainless steel bands and hardware.

### **3.08 PIPE INSULATION**

- A. Provide insulation when indicated on the drawings or where depth of cover is less than 6'. Unless otherwise noted, install 2" thick polystyrene board insulation.
- B. Install insulation on compacted initial cover material, 6" above the top of pipe. Stagger joints where more than one layer of insulation is required. Provide insulation with a minimum of 1' of initial cover material. Place cover and backfill material in a manner that does not damage insulation; replace any damaged insulation.

### **3.09 LOCATOR TAPE**

- A. Install locator tape approximately 2' above the top of the pipe.

### **3.10 TRACER WIRE (FOR ALL NON-METALLIC SANITARY PIPE)**

- A. Tracer wire shall be installed in accordance with all the following:
  1. Tracer wire shall be installed along the length of the non-metallic pipe.
  2. Tracer wire shall be located directly above and within 6" of the non-metallic pipe.
  3. Exterior access locations shall include a means of protecting the tracer wire, a curb box shall be provided and installed at the edge of the building and labeled "sewer".
  4. In ground sleeves shall be provided in accordance with current Commerce Plumbing Code.
  5. Tracer wire conductivity shall be tested prior to use.
  6. Conductor warning tape may not be utilized in lieu of tracer wire.

### **3.11 DEFLECTION TESTING**

- A. Test all PVC sewer pipe in the presence of the Construction Representative by a "go-no-go" deflection test mandrel furnished by the Contractor. Do not perform deflection testing any sooner than 30 days following the installation of the PVC pipe. Pull the mandrel by hand, or hand operated winch so as to avoid any damages to the pipe that may be caused by mechanized pulling equipment.
- B. Size the to test the pipeline for a maximum allowable internal deflection of the pipe (in any direction) of not to exceed five (5) percent of the original internal diameter for the pipelines tested, regardless of how long after installation the testing takes place.
- C. Deflection testing may be done concurrently with any necessary televising of the sewers. When done concurrently with sewer televising, the mandrel may be pulled by mechanized equipment, provided the mandrel is visible in the television picture during the testing and the operation of the mandrel can be quickly halted before damage to the pipe occurs.
- D. Where poor trench soils conditions require the pipe excavation to be undercut and/or over excavated, the Construction Representative reserves the right to require an additional deflection test prior to the expiration of the Contractor's one year performance guarantee.
- E. Remove and replace pipe that fails to pass the five (5) percent vertical deflection testing until the pipe passes the deflection test.

### **3.12 LEAKAGE TESTING**

- A. All new sanitary sewer lines shall be leakage tested in accordance with Chapter 3.7.0 of Standard Specifications for Sewer and Water Construction.

### **3.13 SEWER TELEVISION**

- A. Sanitary sewers may be videotaped by Owner. If videotaping reveals a defect that requires repair, Contractor shall reimburse Owner for cost of videotaping that section of pipe. All sanitary sewers with defects, including but not limited to cracked or deformed pipe, misaligned joints, unsealed lift holes, and incorrect gradelines, as identified through videotaping, shall be re-laid or shall be paid for at 50% of the price bid. Relaying the pipe or reducing payment shall be at Owner's discretion.
- B. The Contractor shall provide to the Construction Representative with 2 copies of the televising DVD or thumbdrive.

### **3.14 ABANDON SEWER**

- A. Where indicated on the plans existing sewer is to be left in place shall be abandoned in accordance with Section 3.2.24 of the Standard Specifications for Sewer & Water Construction (with the exception of paragraph B). Sewer shall not be abandoned until existing services have been reconnected to the replacement sewer. Abandoning sewers is considered incidental to the construction.

- B. In paved areas or current/future building pad areas, existing storm sewer facilities are required to be abandoned as follows:
1. Remove existing pipes or fill them with sand or grout and seal ends with a minimum 2-foot thick grout plug.
  2. Remove existing inlets, catch basins, and manholes to at least 4 feet below finished grade. Provide a minimum 6-inch hole in the bottom of the structure and fill the remaining portion with bedding stone.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**

## SECTION 33 40 00

### STORM DRAINAGE UTILITIES

#### **PART 1 – GENERAL**

##### **1.01 SCOPE**

- A. The work under this section shall consist of providing all work, materials, labor, equipment, and supervision necessary to provide for the storm sewer work required in these specifications and on the drawings. This specification shall apply to all storm sewer work beginning at a point 5' outside of the building wall, unless otherwise specified. Included are the following topics:

##### PART 1 - GENERAL

- Scope
- Related Work
- Reference
- Reference Standards
- Submittals
- Provisions for Future Work
- Record Drawings

##### PART 2 - MATERIALS

- General
- Pipe (general)
- Reinforced Concrete Pipe
- PVC Pipe
- HDPE Pipe (Solid Wall and Slotted)
- Connections for Dissimilar Pipe Materials
- Round Catch Basins
- ADS Drain Basin
- Castings
- Apron Endwalls
- Pipe Insulation
- Locator Tape
- Tracer Wire
- Downspout Connections

##### PART 3 - EXECUTION

- Notification
- Laying Pipe
- Bedding/Initial Cover
- Structures (Manholes, Inlets, Round Catch Basins)
- Apron Endwalls
- Casting Installation
- Connections to Existing Structures
- Sewer Laterals
- Pipe Insulation
- Locator Tape
- Tracer Wire
- Deflection Testing
- Leakage Testing
- Sewer Televising
- Abandon Sewer

##### **1.02 RELATED WORK**

- A. Applicable provisions of Division 01 shall govern all work under this section.

31 05 00	Common Work Results for Earthwork (Outside Building footprint)
31 23 16.13	Trenching
31 25 00	Erosion Control
33 05 00	Common Work Results for Utilities

### 1.03 REFERENCE

- A. Applicable provisions of Division 01 shall govern all work under this section.

### 1.04 REFERENCES

- A. Where these specifications do not cover portions of the work to be undertaken, the Standard Specifications for Sewer and Water Construction in Wisconsin, current edition, shall govern the work.

- B. American Society for Testing and Materials (ASTM):

C76-05b	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
C425-04	Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings
C443-05a	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
C507-05a	Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe
C700-05	Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated
C877-02e1	Standard Specification for External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections
D1784-03	Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
D2235-04	Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings
D2564-04	Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems
D2680-01	Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping
D3034-04a	Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
D3212-96a (2003)e1	Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
D3350-05	Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
D4673-02	Standard Classification System for Acrylonitrile-Butadiene-Styrene (ABS) Plastics and Alloys Molding and Extrusion Materials
F477-02e1	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
F679-03	Standard Specification for Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings

American Water Works Association (AWWA):

C104/ANSI A21.4-95	Standard For Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
C111/A21.11-00	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
C151/ANSIA21.53-00	Standard for Ductile Iron Pipe, Centrifugally Cast for Water or Other Liquids

American Association of State Highway and Transportation Officials (AASHTO):

AASHTO M252	Corrugated Polyethylene Drainage Pipe
AASHTO M294	Corrugated Polyethylene Pipe, 12- to 48-in Diameter

### 1.05 SUBMITTALS

- A. Provide manufacturer's product information (cut sheets), shop drawings, and O&M information as indicated in Section 31 00 05 – Civil General Requirements for storm sewer materials including:
1. Pipe
  2. Fittings
  3. Structures
  4. Outfalls

5. Castings

- B. Provide reports documenting any required testing.

**1.06 PROVISIONS FOR FUTURE WORK**

- A. Construct sewer system in a manner that will facilitate future extension or connection.
- B. Review plans prior to installation, and notify Construction Representative if proposed design does not appear to accommodate future extension or connection.
- C. When drawings indicate future connection at a manhole or other structure, install a full length of pipe beyond the structure, providing plugged bell at terminal end of pipe. Provide marker board at terminal end of stubbed pipe.

**1.07 RECORD DRAWINGS**

- A. Refer to Section GR - General Requirements.
- B. Maintain record drawings that show the actual locations, sizes and types of utilities and other features encountered.
- C. Note any modifications to proposed sewer system size, location or elevation. Record any other deviations from the drawings.

**PART 2 - MATERIALS**

**2.01 GENERAL**

- A. Conform all materials to the size and type shown on the plans or as called for in the specifications and to applicable Laws, Codes, and Ordinances.
- B. All products and materials are to be new, undamaged, clean, and in good condition. Existing products and materials are not to be reused unless specifically indicated.
- C. Be responsible for the safe storage and handling of all materials utilized in the work. Store all materials in areas designated by the Construction Representative in cooperation with the Owner.
- D. Perform all work in accordance with any applicable manufacturer's instructions.

**2.02 PIPE (GENERAL)**

- A. Provide the size, type and class/schedule of pipe as indicated on the drawings.
- B. Use only pipe supplied from the same manufacturer, and of the same type, unless otherwise specified or approved in advance by the Engineer.
- C. When applicable, only pipe, joints, material and installation approved by Wisconsin Department of Natural Resources and/or the Wisconsin Department of Safety and Professional Services (SPS) for the intended use in the State of Wisconsin shall be used.

**2.03 REINFORCED CONCRETE PIPE**

- A. Pipe and fittings shall conform to ASTM C-76 for circular pipe and ASTM C-507 for elliptical pipe. Unless otherwise specified, provide Class III for circular pipe and Class HE-III for elliptical pipe.
- B. Joints for reinforced concrete pipe shall be bell and spigot or tongue and groove. Joints shall be provided with rubber gaskets conforming to ASTM C433. Joints for elliptical pipe shall be provided with trowelable impervious bituminous joint sealer that is manufactured for sealing reinforced concrete sewer pipe joints.

- C. When required, external sealing bands shall meet the requirements of ASTM C877 (Type II), and shall be Mar Mac Mac Wrap, or approved equal.

#### **2.04 PVC PIPE (SOLID)**

- A. Conform to ASTM D-3034 with solvent weld or elastomeric joints. Pipe shall be SDR-35, unless otherwise noted. Pipe over 15 inches in diameter shall meet the requirements of ASTM F679-03.
- B. The wall thickness shall conform to requirements for a T-1 wall. PVC material shall have cell classification 12454-B or 12454-C as defined in ASTM D1784 with minimum modules of elasticity of 400,000 psi in tension. The pipe wall shall be homogeneous and contain no seams. Minimum pipe stiffness per ASTM D2412 shall be 60 psi for pipe sizes through 18-inch and 46 psi for 21-inch and larger pipe sizes. Pipe shall withstand impact of 210 foot-pounds for pipe sizes through 8-inch and 220 foot-pounds on larger sizes.
- C. Pipe and fittings shall be the product of one manufacturer and the manufacturer shall have experience records substantiating acceptable performance of the pipe to be furnished.
- D. Fittings shall be injection molded. Fittings such as saddles, elbows, tees, wyes and others shall be of material and construction corresponding to and have a joint design compatible with the adjacent pipe. Approved adapters shall be provided for transitions to other types of pipe.
- E. Joints shall be of the elastomeric type. Elastomeric joints shall be a bell and spigot joint conforming to ASTM D3212 sealed by a rubber gasket conforming to ASTM F477 so that the assembly will remain watertight under all conditions of service, including the movements resulting from the expansion, contraction, settlement and deformation of the pipe. Bells shall be formed integrally with the pipe and shall contain a factory installed positively restrained gasket.
- F. All exposed end sections shall be provided with steel apron end walls.

#### **2.05 HDPE PIPE (SOLID WALL AND SLOTTED)**

- A. Conform to ASTM-D-3350 for PE material with a cell classification of 335434C or better. Pipe shall be thermal butt fusion in accordance with manufacturer's recommendation.
- B. Slotted HDPE pipe shall be ADS N12 with AASHTO Class II perforations, or approved equal.

#### **2.06 CONNECTIONS FOR DISSIMILAR PIPE MATERIALS**

- A. Where new sewer connects to an existing dissimilar pipe, the connection shall be made with a no hub type couplings meeting the requirements of CISPI 310. Couplings shall have neoprene gaskets with stainless steel shield, and multiple stainless steel clamps with worm gear tightening device. The couplings shall be made specifically for the type and size of pipe materials being connected. Couplings shall be Fernco Husky or approved equal.

#### **2.07 ROUND CATCH BASINS**

- A. General
  1. Round catch basins shall be 48" (MIN) inside diameter precast concrete unless otherwise shown or required. (See plans for specific sizes.)
  2. Submit manufacturer's preproduction (shop) drawings for approval prior to the start of manufacturing.
  3. Contractor shall carefully locate all pipe locations, sizes, orientation and elevation prior to ordering catch basin.
  4. Round catch basins shall meet the requirements of ASTM C478.
  5. Pre-cast catch basin wall thickness shall be minimum of 5".
  6. Provide 8" (min.) thick pre-cast catch basin base. Catch basin bottom section may be pre-cast with integral base.
  7. Catch basins shall be provided with precast reinforced concrete in-bell cover designed to accommodate AASHTO H20 loading. In-bell cover shall be provided with 24" opening for casting.



- B. Joints
  - 1. Catch basins requiring separate base and riser sections must be provided with standard pipe tongue and groove joints.
  - 2. Seal joints watertight with prefabricated rubber or plastic gaskets or formed in place butyl rubber seal.
  - 3. Joint sealers shall be Kent Seal, ConSeal, or approved equal circular O-ring conforming to ASTM C443: Ramnek, Mas-Stik, butyl rubber gasket, or butyl rubber rope.
- C. Connections
  - 1. Provide custom knock-outs/cut-outs based on project and location specific conditions.
  - 2. A minimum of 2" of the precast structure is required between the top of a knock-out/cut-out and the top of the structure. A minimum of 2" of precast structure is required between the side of a knock-out/cut-out and the inside face of an adjacent sidewall.
- D. Steps
  - 1. Provide steps at 16 inches O.C.± and project approximately 6" from wall.
  - 2. Unless otherwise indicated on the drawings, locate steps over the downstream pipe opening.
  - 3. Steps shall be steel reinforced polypropylene with 1/2-inch diameter deformed reinforcing bar. Steps shall be permanently secured in the catch basin wall.  
Steps shall be M.A. Industries No. PS1-PF or approved equal.
- E. Flowline
  - 1. Provide either pre-cast or cast-in-place flowline that provides positive flow through the structure. Provide bench that directs water towards the flowline.
  - 2. Flowlines and benches shall be formed with gradual, uniform sweeps directed towards the downstream pipe. Provide smooth, troweled finish for flowlines.
- F. Adjusting Rings
  - 1. Adjusting rings shall be injection molded high density polyethylene (HDPE), manufactured by Ladtech, IPEX, or equal. Joints shall be sealed with approved silicone or butyl sealant in accordance with manufacturer's recommendations. Materials shall conform to ASTM D-1248 using 100% recycled material. Rings shall be tested to assure compliance in meeting H-20 loading capacity per AASHTO Standards.
  - 2. Where casting adjustment requirements cannot be met by the use of HDPE adjustment rings and upon Engineer's approval, Contractor shall provide precast concrete adjusting rings.
  - 3. Fiber-reinforced pre-cast concrete adjusting rings meeting the requirements of ASTM C-478. Provide rings of 2" or 4" thickness.
  - 4. Precompressed butyl gasket, 3/8"x3 1/2" shall be used between the top of the manhole and first adjustment ring, and between all subsequent rings. Butyl material shall be E-Z Stick, or equal.

## **2.08 ADS DRAIN BASIN**

- A. General
  - 1. PVC surface drainage inlets shall include the drain basin type as indicated on the contract drawing and referenced within the contract specifications. The ductile iron grates for each of these fittings are to be considered an integral part of the surface drainage inlet and shall be furnished by the same manufacturer. The surface drainage inlets shall be as manufactured by Nyloplast a division of Advanced Drainage Systems, Inc.
  - 2. Submit manufacturer's preproduction (shop) drawings for approval prior to the start of manufacturing.
  - 3. Contractor shall carefully locate all pipe locations, sizes, orientation and elevation prior to ordering inlets.
  - 4. Provide grates / castings of the type and size as noted on the plans.

## **2.09 CASTINGS**

- A. General

1. All castings shall be heavy duty iron conforming to ASTM A48, Class 20 and rated for AASHTO H-20 loading. Provide non-rocking or machined castings with concealed pickhole.

B. Frames and grates shall be as noted on the plans.

## **2.10 FLARED END SECTIONS**

### **A. General**

1. Provide apron endwalls where shown on the drawings and at the following locations:
  - a. Where storm sewers outfall into ditches, swales or other surface water body
  - b. On both ends of a culvert pipe (pipe that crosses under a road, sidewalk, trail or other surface feature)

B. Unless otherwise indicated, apron endwalls shall be reinforced concrete meeting the requirements of ASTM C-76. Flared end sections shall have a round bottom at the pipe connection that allows for the use of a dissimilar pipe connection adapter.

C. Apron endwalls in diameter shall be restrained using a minimum of two pipe ties per section. Pipe ties shall also be used to restrain the first two pipes located immediately upstream of the apron endwall. Pipe ties shall be constructed using galvanized  $\frac{3}{4}$ " diameter steel rod and hardware, or other approved materials. Pipe ties shall be bolted through the sidewall of the pipe.

D. Connect concrete apron end walls to dissimilar pipe materials with the with an external coupler for dissimilar pipe connections, the dissimilar pipe coupler as manufactured by mar mac construction products (or approved equal) shall be installed according to the manufacturer's recommendations. The coupler shall have an outer cover of polyethylene with an under layer of rubberized mastic that is reinforced with a woven polypropylene fabric laminated to a second layer of rubberized mastic and polyethylene. There shall be a peelable protective release film against the mastic that is removed when the coupler is applied to the joint. Securing straps shall be incorporated within the coupler, two each on either side of the butt joint. The securing straps shall be isolated from the mastic allowing the straps to tension with equal force around the pipe circumference. The coupler shall be designed so that when it is applied around the joint the ends shall overlap a minimum of 8". After the straps are secured, a polyethylene/mastic flap shall completely cover the straps.

D. Apron endwalls for pipe greater than 18" in diameter shall be provide with pipe gates. Pipe gates shall be constructed of 1" diameter standard steel pipe members with welded connections and spaced no greater than 12" O.C.E.W. Pipe gate shall be attached to endwall at a minimum of 4 locations using 4"x4"x3/16" thick steel angles and 3/8" galvanized machine bolts. Pipe gates shall be provided with a galvanized finish, unless noted.

## **2.11 PIPE INSULATION**

A. Rigid, closed-cell extruded polystyrene insulation. Insulation shall be suitable for buried insulation.

B. Individual boards shall have dimensions of 8'x4'x2".

C. Insulation shall follow Wisconsin Department of Safety and Professional Services Administrative Code SPS 382.

D. Dow Styrofoam or approved equal.

## **2.12 LOCATOR TAPE**

A. Detectable metallic locator tape, specifically manufactured for marking utilities.

B. Tape shall be a minimum of 6" wide and shall be marked "STORM".

## **2.13 TRACER WIRE (FOR ALL NON-METALLIC STORM PIPE)**

A. Tracer wire shall be a minimum of 10 gauge, insulated, single-conductor copper wire or equivalent.

- B. Tracer wire insulation color for storm sewer (non-metallic) shall be brown.
- C. As an alternative to the tracer wire, GPS data shall be recorded with the municipality where the non-metallic pipe is located.

#### **2.14 DOWNSPOUT CONNECTIONS**

- A. All downspout connections to the storm sewer system shall be made with a manufactured adapter designed for the purpose of connecting downspouts to the storm sewer system.
- B. Adapter color shall be chosen by owner or architect and shall match the downspout color.
- C. Storm Sewer pipe shall be cut flush with finished grade and the downspout adapter installed at finished grade such that no part of the storm sewer pipe is visible.

### **PART 3 - EXECUTION**

#### **3.01 NOTIFICATION**

- A. Contractor, prior to excavation work, shall notify all utilities, governmental agencies, or entities, known to, or which can reasonably be assumed to, have above or below ground pipe, conduit cables, structures or similar items within limits of project, to locate and mark location of such items. The Contractor shall expose potential pipe conflicts prior to installation of sewers to allow for any field changes to the design to be made.

#### **3.02 LAYING PIPE**

- A. Install all pipe in accordance with ASTM specifications which pertain to the specified type of pipe material and the installation situation.
- B. Do not use any pipe or fittings cracked in cutting or handling or otherwise not free from defects.
- C. Clean all pipe of any dirt and/or debris both inside and out prior to placing in the trench.
- D. Make joints in accordance with manufacturer's directions with due care to avoid damaging pipe and/or disturbing previously laid pipe.
- E. Cut pipe only according to manufacturer's directions.
- F. Lay all sewer pipes to horizontal alignment and grade shown on the plans with bell ends up hill. Establish and maintain horizontal alignment using total station, transit or theodolite. Use pipe laser or level to establish and maintain grade of pipe. Discrepancies from the required horizontal alignment or grade at any location shall not be greater than 0.10' or 0.05', respectively.
- G. Do not exceed specified trench widths.

#### **3.03 BEDDING/INITIAL COVER**

- A. Provide bedding and initial cover in accordance with the applicable requirements of Section 31 23 16.13 – Trenching.
- B. Storm sewer and sewer services shall be provided with 4" of bedding material and 12" of initial cover material (both measured at the bell of the pipe). Crushed Stone Bedding shall be used for both bedding and initial cover.

#### **3.04 STRUCTURES (MANHOLES, INLETS, ROUND CATCH BASINS)**

- A. Contractor shall determine the proper location, size, elevation, and orientation of all pipes entering new structures before ordering. Do not connect abandoned pipes to new structures. Structures having improper location and/or orientation of the pipe connections will be rejected. Field repairs or adjustments of connection points are not permitted.
- B. Limit the excavation for structures so as to provide only the necessary amount of space to sufficiently prepare the subgrade, set the base, set the structure, and lay pipe. Provide a minimum of 1' of clearance between structure and trench wall for adequate backfilling and compaction.
- C. Where excavation occurs below the bottom elevation of the structure's base, bring the excavation to the required elevation by the use of compacted crushed stone bedding. A minimum of 8 inches of compacted Crushed Stone Bedding shall be placed below the bottom of the structure base.
- D. Set structure base in accordance with elevation and location as indicated on the plans. Install base plumb and level. Install subsequent pre-cast sections in accordance with shop drawing layout. Provide watertight gaskets between each section.
- E. Pour inverts with smooth surface draining to downstream pipe. Where two or more lines meet at an angle, provide curved channel. Slope bench or floor at 2 inches/ft. towards flow channel.
- F. Structures shall be provided with between 4" and 8" of adjusting rings, with the top adjusting ring being 2" thick. Provide butyl sealant material between rings. Once rings are in place, tuck point the exterior joint and provide the entire exterior surface of the adjusting ring riser with a coating of mortar.

### **3.05 APRON ENDWALLS**

- A. Limit the excavation for apron endwalls so as to provide only the necessary amount of space to sufficiently prepare the subgrade, set the endwall and lay pipe. Provide a minimum of 1' of clearance between structure and trench wall for adequate backfilling and compaction.
- B. Where excavation occurs below the bottom elevation of the apron endwall bottom, bring the excavation to the required elevation by the use of compacted crushed stone bedding. A minimum of 8 inches of compacted Crushed Stone Bedding shall be placed below the bottom of the apron endwall.
- C. Set apron endwall in accordance with elevation and location as indicated on the plans. Install base plumb and level. Provide joint restraint between the apron endwall and the first two pipes located immediately upstream of the apron endwall.
- D. Where shown on the plans connect concrete apron end walls to dissimilar pipe materials with the with an external coupler for dissimilar pipe connections, the dissimilar pipe coupler as manufactured by mar mac construction products or an approved equal and shall be installed according to the manufacturer's recommendations. The coupler shall have an outer cover of polyethylene with an under layer of rubberized mastic that is reinforced with a woven polypropylene fabric laminated to a second layer of rubberized mastic and polyethylene. There shall be a peelable protective release film against the mastic that is removed when the coupler is applied to the joint. securing straps shall be incorporated within the coupler, two each on either side of the butt joint. the securing straps shall be isolated from the mastic allowing the straps to tension with equal force around the pipe circumference. the coupler shall be designed so that when it is applied around the joint the ends shall overlap a minimum of 8". After the straps are secured, a polyethylene/mastic flap shall completely cover the straps.
- D. Provide permanent matting downstream of apron endwalls at all storm sewer outfalls and at other locations as indicated on the drawings.

### **3.06 CASTING INSTALLATION**

- A. Install casting type as indicated on the plans or in the specifications. If the plans and specifications are in conflict, the plans shall govern.

- B. Provide butyl sealant material between last adjusting ring and casting base. Adjust casting elevation and slope to match adjacent proposed grades.

### **3.07 CONNECTIONS TO EXISTING STRUCTURES**

- A. Make all necessary openings into existing structures or sewers including the reconstruction of existing inverts or benches, as necessary. Patch all openings permanently watertight with concrete brick and mortar, hydraulic cement, or flexible watertight boots.

### **3.08 PIPE INSULATION**

- A. Provide insulation as required by Commerce Code. Unless otherwise noted, install 2" thick polystyrene boards insulation.
- B. Install insulation on compacted initial cover material, 6" above the top of the pipe. Stagger joints where more than one layer of insulation is required. Provide insulation with a minimum of 1' of initial cover material. Place cover and backfill material in manner that does not damage insulation; replace any damaged insulation.

### **3.09 LOCATOR TAPE**

- A. Provide locator tape over all storm sewer, and storm laterals; do not place over underdrains.
- B. Install locator tape approximately 2' above the top of the pipe.

### **3.10 TRACER WIRE (FOR ALL NON-METALLIC STORM PIPE)**

- A. Tracer wire shall be installed in accordance with all the following:
  - 1. Tracer wire shall be installed along the length of the non-metallic pipe.
  - 2. Tracer wire shall be located directly above and within 6" of the non-metallic pipe.
  - 3. Exterior access locations shall include a means of protecting the tracer wire.
  - 4. In ground sleeves shall be provided in accordance with Wisconsin Department of Safety and Professional Services Administrative Code SPS 382.35.
  - 5. Tracer wire conductivity shall be tested prior to use.
  - 6. Conductor warning tape may not be utilized in lieu of tracer wire.

### **3.11 DEFLECTION TESTING**

- A. Test all PVC and HDPE sewer pipe in the presence of the Construction Representative by a "go-no-go" deflection test mandrel furnished by the Contractor. Do not perform deflection testing any sooner than 30 days following the installation of the pipe. Pull the mandrel by hand, or hand operated winch so as to avoid any damages to the pipe that may be caused by mechanized pulling equipment.
- B. Size the to test the pipeline for a maximum allowable internal deflection of the pipe (in any direction) of not to exceed five (5) percent of the original internal diameter for the pipelines tested, regardless of how long after installation the testing takes place.
- C. Deflection testing may be done concurrently with any necessary televising of the sewers. When done concurrently with sewer televising, the mandrel may be pulled by mechanized equipment, provided the mandrel is visible in the television picture during the testing and the operation of the mandrel can be quickly halted before damage to the pipe occurs.
- D. Where poor trench soils conditions require the pipe excavation to be undercut and/or over excavated, the Construction Representative reserves the right to require an additional deflection test prior to the expiration of the Contractor's one year performance guarantee.
- E. Remove and replace all pipe that fails to pass the five (5) percent vertical deflection testing until the pipe passes the deflection test.

### **3.12 LEAKAGE TESTING**

- A. Storm sewers shall be visually inspected for excessive water infiltration and soil leakage into sewers or structures. Contractor shall repair/correct any infiltration or soil leakage that is considered excessive by the Construction Representative.

### **3.13 SEWER TELEVISISING**

- A. Storm sewers may be videotaped by Owner. If video recording reveals a defect that requires repair, Contractor shall reimburse Owner for cost of videotaping that section of pipe. All storm sewers with defects, including but not limited to cracked or deformed pipe, misaligned joints, unsealed lift holes, and incorrect gradelines, as identified through videotaping, shall be relaid or shall be paid for at 50% of the price bid. Relaying the pipe or reducing payment shall be at Owner's discretion.

### **3.14 ABANDONMENT OF EXISTING STORM SEWER FACILITIES**

- A. Where indicated on the plans, existing sewer to be left in place shall be abandoned in accordance with Section 3.2.24 of the Standard Specifications for Sewer & Water Construction (with the exception of paragraph B). Sewer shall not be abandoned until existing services have been reconnected to the replacement sewer. Abandoning sewers is considered incidental to the construction.
- B. In paved areas or current/future building pad areas, existing storm sewer facilities are required to be abandoned as follows:
  - 1. Remove existing pipes or fill them with sand or grout and seal ends with a minimum 2-foot thick grout plug.
  - 2. Remove existing inlets, catch basins, and manholes to at least 4 feet below finished grade. Provide a minimum 6-inch hole in the bottom of the structure and fill the remaining portion with bedding stone.

END OF SECTION

## SECTION 33 56 10

### FUEL STORAGE TANK DEMOLITION

#### **PART 1 - GENERAL**

##### **1.01 SCOPE**

- A. Provide all work needed for removal and closure of underground fuel storage tanks as required in these specifications and on the drawings. Work shall be completed in compliance with applicable local, state, and federal rules and regulations governing tank removals and the handling, transport, and disposal of sludge and liquid wastes, tanks and associated piping, and other waste materials.

Part 1 - Scope

- Summary of Work Included
- Related Work Covered Elsewhere
- References
- Quality Assurance
- Protection of Existing Work and Facilities
- Provisions for Future Work
- Construction Limits
- Notification/ Permits
- Closure Assessment Plan
- Discontinuation of Utility Services
- Tank Information
- Closure Documentation

Part 2 - Materials

- Equipment
- Barricades and Warning Devices
- Controlled Backfill
- Owner Furnished Materials
- Items for Storage/Reuse

Part 3 - Execution

- General
- Protection of Tank Site
- Utility Lines
- Site Demolition
- Storage of Salvaged Materials
- Mechanical and Electrical Components
- Tank Preparation/Purging/Bottom Wastes
- Tank Removal/Cleaning/Disposal
- Site Assessment
- Contaminated Site
- Disposal of Contaminated Soil
- Backfilling
- Site Restoration

##### **1.02 SUMMARY OF WORK INCLUDED**

- A. The scope of work includes but is not limited to:
1. Notification of state and local authorities; development of Closure Assessment and Site Safety Plans; site demolition; other pre-closure activities.
  2. Preparing tank(s) for removal and purging tank(s) of flammable vapors.
  3. Cleaning tank(s) and proper handling and disposal of contaminated tank wastes and sludge.
  4. Removal and safe disposal of the underground fuel storage tank(s) and associated piping.
  5. Performing assessment of tank site(s); sampling and testing soil and groundwater for possible contamination.
  6. Backfilling and restoring tank site(s).
  7. Preparing Closure Assessment Report(s) within 30 days of the date of tank removal, documenting all actions taken by the contractor and lab test results.

### **1.03 RELATED WORK COVERED ELSEWHERE**

- A. Other related work:
  - 1. Clearing and Earthwork: Section 02200.
  - 2. Erosion Control: Section 02270.
  - 3. Paving and Surface Work: Section 02500

### **1.04 REFERENCES**

- A. Applicable provisions of Division 1 shall govern work of this section.
- B. Work shall conform to procedures and practices in the following regulatory guidelines and industry standards:
  - 1. WI Admin. Code COM 10, "Flammable and Combustible Liquids".
  - 2. NFPA 327, "Standard Procedures for Cleaning & Safeguarding Small Tanks".
  - 3. API 1604, "Removal and Disposal of Used Underground Petroleum Storage Tanks".
  - 4. API 2015, "Safe Entry and Cleaning of Petroleum Storage Tanks".
  - 5. National Institute for Occupational Safety and Health, "Criteria for a Recommended Standard.- Working in Confined Space".
  - 6. Department of Commerce, "Tank Owners Guide for Underground Storage Tanks".
  - 7. DNR Publication SW-130, "Leaking Underground Storage Tank (LUST) Analytical Guidance".
  - 8. DNR Publication SW-175, "Site Assessments for Underground Storage Tanks - Technical Guidance".

### **1.05 QUALITY ASSURANCE**

- A. Comply with applicable rules, regulations, codes, and ordinances of local, state, and federal Authorities and regulations of public utility companies having jurisdiction over the work.
- B. Only qualified persons certified by the Department of Commerce shall perform tank removal, tank cleaning, and site assessments.
- C. Obtain and pay for necessary permits, licenses and certificates required.
- D. Obtain and pay for necessary permits and certificates required and give proper notices for and during performance of site demolition and tank removal work.
- E. Comply with local Fire Department requirements.
- F. State and local code requirements shall control the handling, storage, transportation, and disposal of solid wastes, contaminated soils and excavation water, tank scrap materials, hazardous or non-hazardous tank bottom wastes, and other demolition materials.

### **1.06 PROTECTION OF EXISTING WORK AND FACILITIES**

- A. Tank location(s) shown on site plan is approximate. Make such explorations and probes as necessary to locate tank and ascertain any required protection measures that shall be used before proceeding with site demolition and removal of underground tank(s).
- B. Verify the locations of, and protect, any signs, paved surfaces, buildings, structures, sidewalks, landscaping, streetlights, hydrants, data transmission, utilities, and all other such facilities and improvements that may be encountered or interfered with during the progress of the work, both inside and outside the construction limits .
- C. Take all measures necessary to safeguard all existing work and facilities which are outside the limits of the work or items which are within the construction limits but are intended to remain.
- D. Provide and maintain adequate catch platforms, warning lights, barricades, guards, weather protection, dust protection, fences, planking, bracing, shoring, piling, signs, and other items required for proper protection of work.



- E. Provide protection for workmen, public, adjacent construction, and occupants of existing building(s).
- F. Burning of debris on property not permitted.
- G. Provide adequate fire protection.
- H. Explosives shall not be used.
- I. Provide protection for adjacent private property.
- J. Proper erosion control practices shall be employed to minimize surface runoff to adjacent properties, nearby streams, or other surface waters. Erosion control shall comply with the Wisconsin Construction Site Management Practices Handbook
- K. Be responsible for any sidewalk, curb, gutter or street paving damaged by any operation under this contract, and be responsible for the repair of all damage in compliance with local municipality rules and regulations at no additional expense to the Owners.
- L. Make repairs or provide new replacement of all damage which is not part of the work on project site or to adjacent property to Architect/Engineer or Owner's satisfaction.

#### **1.07 CONSTRUCTION LIMITS**

- A. The work of this Section shall be confined to the Construction Limits as indicated on the drawings. In the absence of such a designation on the drawings, the work shall be confined to the minimum area reasonably necessary to undertake the work as determined by the Engineer. All areas disturbed by the site demolition, excavation, and tank removal work, plus such additional areas as are disturbed by construction related activities including construction access and storage shall be considered the "Construction Area."

#### **1.09 NOTIFICATION/ PERMITS**

- A. Notify in writing the local fire department chief, the local WI Department of Commerce authorized agent, and the Project Engineer of closure schedule at least 15-30 days prior to removal of tank. Obtain permits, coordinate with local fire officials, and comply with local ordinances governing tank closures.

#### **1.10 CLOSURE ASSESSMENT PLAN**

- A. Develop a written Closure Assessment and Site Safety Plan, including proposed field assessment procedures, tank cleaning and disposal procedures, contaminated liquid waste and sludge management, wastewater handling and disposal procedures, and a contingency plan for managing contaminated soils and excavation water. Wash water from tank cleaning shall be kept separate from contaminated liquid and sludge waste to minimize waste disposal costs. Plan shall meet minimum requirements of COM 10, Appendix B, and must be available for reference at the site during tank removal and assessment activities.

#### **1.11 DISCONTINUATION OF UTILITY SERVICES**

- A. Disconnecting and restore any utility services that may interfere with tank removal.
- B. Notify companies and local authorities owning poles, conduit, wires or pipes running to the building or structure. Take out all required permits and pay all required fees related to this work.
- C. Existing service piping and utilities, including but not limited to:
  - 1. Sewer, water and gas.
  - 2. Electrical service
  - 3. Telephone, fire alarm system, data, and intercommunications.

#### **1.12 TANK INFORMATION**

- A. A site location map and a plan of each tank site is attached, showing approximate location of buildings, site development, property lines, name of contact person, etc. This is not to scale and should not be used to evaluate site conditions or estimate work quantities for bidding.

#### **1.13 CLOSURE DOCUMENTATION**

- A. Complete a Department of Commerce "Underground Petroleum Tank Inventory", form SBD-7437, and submit to the Department of Commerce at the address shown on the form. Send an additional copy to the State Project Representative.
- B. Tank removals must be properly documented. Documentation shall conform to the minimum requirements listed in WI Admin. Code COM 10, Appendix B.
- C. Department of Commerce "Checklist For Underground Tank Closure", form SBD-8951, shall be completed for each tank removal and submitted to the Department of Commerce at the address shown on the form. Send an additional copy to the Project Engineer. Preferably, this form should be completed by an environmental consultant, Department of Commerce or DNR agent, local fire chief, or other neutral third party.
- D. Prepare a Closure Assessment Report, documenting all tank removal and site assessment activities, analysis results, and other documentation within 30 days of the removal date. Copies of the report should be sent to the following:
  - 1. Bureau of Solid and Hazardous Waste Management  
Environmental Response and Repair Section  
Madison, WI 53707
  - 2. Division of Facilities Development  
PO Box 7866  
Madison, WI 53707
  - 3. State Owner Agency(as directed by Project Representative)

### **PART 2 - MATERIALS**

#### **2.01 EQUIPMENT**

- A. Use Contractor's normal equipment for demolition and tank removal which meets all safety requirements imposed on such equipment and provides adequate safeguards against ignition of flammable vapors.

#### **2.02 BARRICADES AND WARNING DEVICES**

- A. Provide traffic barricades and warning devices in accordance with governing codes and regulations and the Manual of Uniform Traffic Control Devices (MUTCD).
- B. Provide protective barrier fencing together with all supports and braces necessary to provide an adequate safety barrier to unattended excavations.
- C. Provide all necessary warning signing as required by OSHA, these specifications, or as shown on the drawings.

#### **2.03 CONTROLLED BACKFILL**

- A. Provide sand or pit-run sand/gravel, graded from 1 inch maximum downward through the particle range. Not more than 5% of material passing #4 sieve shall pass number 200 sieve.

### **PART 3 - EXECUTION**

#### **3.01 GENERAL**

- A. All work shall be in accordance with these specifications and all applicable codes, laws, and ordinances. Accomplish all work required by drawings, including work specifically related to work notes.
- B. The contractor shall meet with the DFD Project Representative and user agency at a preconstruction meeting to review site conditions, the Closure Assessment Plan, procedures for handling wastes, site access and control, administrative procedures, and work schedule.
- C. Do not interrupt or change existing traffic patterns or delivery services without prior approval from the Project Representative. When interruption is required, coordinate schedule with the Owner agency to minimize disruptions. Unless specifically stated, all work involved in interrupting or changing existing services is to be done during normal working hours.
- D. Remove all items requiring salvage unless designated "To be removed by Owner".
- E. Where indicated to be turned over to Owner, deliver to location on property where designated by Owner. Exercise care to insure that all items specified or designated on drawings for reuse are carefully removed and stored until they can be reinstalled by trades reusing same.
- F. Coordinate activities to permit access by Owner and other trades required for the work, enabling them to complete work which is assigned to them.

### **3.02 PROTECTION OF TANK SITE**

- A. Provide and maintain fencing around the site and provide protective barricades, signs, warning lights, and/or other equipment necessary to keep the tank site safe under all circumstances as shown on the plan or determined necessary by the Project Representative.
- B. No excavation shall be left unattended without adequate protection.
- C. Protect existing vegetation outside excavation area from unnecessary damage. Provide protection barrier fencing as needed for all landscape features and structures not noted for removal.
- D. Maintain and protect services and utilities that must remain in operation.
- E. Furnish and install any shoring and underpinning needed to protect the excavation or nearby structures.
- F. Protect paving, sidewalks, curbs, gutters, and landscaping that will remain in place.
- G. Provide appropriate erosion control measures and keep streets, walks and all other adjacent paved areas clean and swept clear of dirt, mud and debris that are deposited as a result of this operation.

### **3.03 UTILITY LINES**

- A. Contractor shall verify presence of existing site utilities and contact local diggers hotline for specific line locations if needed.
- B. Shut off, cut and cap utility services to each tank(s) to be removed in accordance with the requirements of the utility.
- C. Notify and coordinate shutdown with user agency.

### **3.04 SITE DEMOLITION**

- A. Demolish and remove all structures within the construction limits including platforms, steps, retaining walls, fences, slabs on grade and all paved surfaces such as walks, drives, and parking areas that interfere with removal of underground tanks. Remove completely all trees and stumps indicated on the plan to be removed.
- B. Remove electrical system, tank related appurtenances, and other site improvements as required for tank removal.

- C. Remove below grade items encountered such as slabs or foundations which interfere with tank removal.
- D. Saw cut bituminous and concrete pavement around area of excavation to provide a smooth straight edge for repair.
- E. Conduct demolition work with minimum interference of roads, streets, driveways, sidewalks and other facilities including adjacent building or structures and their occupants.
- F. Do not close or obstruct traffic on streets, nor close sidewalks, alleys, or driveways without proper city permit. Do not store materials in streets or walks.
- G. Properly barricade all streets, sidewalks, alleys, parking lots, or driveways which are not separated from the work activities by adequate distances to the satisfaction of the engineer.
- H. Carry out vehicle loading as necessary within the project boundaries or as defined or indicated on the drawings, but not in locations that block vehicular traffic on the streets or pedestrian traffic on adjacent public walks.
- I. Immediately and completely remove by scraping, sweeping, shoveling or other such method (except flushing), any demolition debris reaching a public or private roadway, parking lot, sidewalk, or other paved area and which constitutes a hazard to traffic or which may be further scattered by traffic. Any accumulations not requiring immediate attention shall be completely removed at least once at the end of each work day.
- J. No blasting or burning will be permitted on the site(s)
- K. Install temporary shores, struts or bracing where necessary to guard against movement, settlement or collapse of any surrounding buildings or structures designated to remain, and be responsible for repairing any damage related to this activity.
- L. Be liable for movement, settlement, or collapse of any surrounding construction.
- M. Completely demolish buildings and other such structures as shown on plans and remove from site. Use such methods as required to complete work within limitations of governing regulations.
- N. Break up and remove concrete foundations and slabs-on-grade, unless otherwise shown to remain.
- O. Inert demolition materials may be deposited in bottom of excavation prior to placement of backfill. Demolition materials not suitable for backfill are the property of the contractor unless indicated otherwise, and shall be removed from the site and properly disposed.
- P. Backfill which contains rock, boulders, concrete, paving, masonry, other inorganic materials shall be buried under following conditions: None shall be closer than 10 feet of any structure or buried utility. When buried under paving or other surfaced areas, bury 2 foot below subgrade elevation and provide controlled fill over to subgrade elevation.
- Q. Break rubble down, not to exceed 1/2 cu. ft. in size, place in parallel layers not exceeding 12 inches with all voids filled and compacted. Provide a minimum of 6 inches compacted earth fill between each layer.
- R. Demolition debris not containing hazardous materials may be treated as a solid waste and shall be removed from the site properly disposed. Facilities for recycle, disposal, or landfill shall be approved by the Project Representative prior to removal from the site.

### **3.05 STORAGE OF SALVAGE MATERIALS**

- A. The Contractor shall be responsible for the safe storage of all salvage materials until turned over to the Owner or reinstalled. Store salvaged materials where directed by Owner and/or where indicated on drawings until turned over to owner or accepted by the Owner following reinstallation.

### **3.06 MECHANICAL AND ELECTRICAL COMPONENTS**

- A. Remove and/or demolish all plumbing, mechanical and electrical components not requiring salvage or reuse.
- B. Cut fire alarm systems and other electrical systems in such a manner as to insure continued operation of the Owner's systems.
- C. Disconnect services to equipment at unions, flanges, valves, or fittings wherever possible.
- D. Take all necessary precautions while dismantling piping containing gas, gasoline, oil or other explosive or injurious fluids. Store such piping outdoors until vapors are removed.

### **3.07 TANK PREPARATION/PURGING/WASTE DISPOSAL**

- A. Drain product piping into tank. Any remaining product at least two inches above tank bottom or accumulated water level, whichever is higher, is considered reusable and shall be removed by the contractor using explosion proof pumping equipment and recycled.
- B. Excavate to top of tank. Remove fill pipe or other fixtures. Vent should be left intact until tank is purged. Plug all other tank openings.
- C. Topsoil shall be stockpiled for reuse in site restoration. Other non-contaminated soil may be saved for backfill if acceptable. Non-acceptable materials must be removed from the site and properly disposed. Contaminated soil shall be handled and disposed in accordance with the Contractor's Contingency Plan and as specified.
- D. Appropriate precautions must be taken to prevent ignition of flammable vapors. Purge the tank of flammable vapors while in ground and before performing any other work on the tank using one of the methods described in API Recommended Practice 1604. Vent vapors from the tank at a minimum height of twelve feet above grade or three feet above adjacent roof lines.
- E. Vapor concentration of tank atmosphere and excavation area should be tested using a properly calibrated combustible gas indicator. Concentrations should be less than 10% of the lower explosive limit of the tank contents before removal of tank bottom wastes or removal of the tank from the ground. Persons performing vapor testing must be completely familiar with the use of the gas indicator instrument and interpretation of its readings.
- F. The remaining tank bottom wastes shall be removed from the tank and properly disposed in accordance with the contractor's Waste Management Plan. Wastes may be classified as either hazardous or non-hazardous depending upon the flammable characteristics of the tank contents. Contractor shall determine if waste materials are hazardous and handle accordingly. Liquid and sludge wastes classified as hazardous must be handled, transported and disposed in accordance with DNR hazardous waste regulations.
- G. Document the chain of custody and disposal method used. The owner agency will arrange for an EPA Hazardous Waste Generator ID Number, if needed.

### **3.08 TANK REMOVAL/CLEANING/DISPOSAL**

- A. After the tank has been freed of vapors, and before it is removed, plug or cap all holes, leaving a 1/8 inch vent hole at the highest point in the tank.
- B. Excavate around the tank to uncover it for removal. Contaminated soil shall be stockpiled on-site in a location designated by the property owner in accordance with the Contractor's Contingency Plan.
- C. Remove tank from excavation and place it on a level surface, and block to prevent movement. Use screwed plugs to plug any corrosion holes in the tank shell.
- D. The tank must be thoroughly cleaned of any remaining sludge or other residues before transport from the site. Tank washwater or other non-hazardous wastes should be collected separately and properly disposed in accordance with the contractor's Waste Management Plan. The tank

becomes the property of the Contractor and should be cut up on site and sold as scrap or properly disposed as solid waste.

- E. Document the chain of custody and tank disposal method used. Tanks removed from the site should be properly labeled and transported in accordance with local, state, and federal regulations.

### 3.09 SITE ASSESSMENT

- A. Soil sample collection and analysis procedures shall be completed in accordance with the contractors Field Procedures Plan. Samples must be collected by persons who are familiar with the plan and who are certified by the Department of Commerce to perform site assessments, or are working under the supervision of a certified person.
- B. Field instruments including photoionization detectors (PID's), flame ionization detectors (FID's), and portable gas chromatographs (GC's) may be used for field screening of soil samples and to choose samples for lab testing. by a certified lab. Field instruments shall be used in accordance with DNR approved techniques, WI Admin. Code COM 10, Appendix B.
- C. Soil samples shall be taken following recommended procedures in the DNR publication, "Site Assessments for Underground Tanks" and in the WI Admin. Code, COM 10 Appendix B, and submitted to a DNR certified lab for appropriate analysis per DNR requirements. Up to Three soil samples and lab tests shall be included in the base bid for each tank, including heating oil tanks less than 4,000 gals. If additional samples and lab tests are needed, they will be paid as an extra based on actual costs.
- D. If groundwater is found within the tank excavation, a sample of groundwater must also be properly collected and submitted to lab for appropriate analysis. The cost of groundwater testing will be paid as an extra based on actual costs.

### 3.10 CONTAMINATED SITE

- A. If obvious contamination exists, the contractor shall **immediately** notify the Project Representative. If free product, heavily saturated soils, or other conditions dictate that a remedial investigation and extensive corrective actions will be needed for clean closure, the soil sampling and lab testing may not be completed, and the excavation shall be protected by backfilling filling with clean soil or providing a temporary barricade as directed by the Project Representative.
- B. The Base Bid will be adjusted for the addition or reduction in scope of work resulting from a contaminated site, including the omission of soil samples and lab tests, the omission of backfill, and/or the addition of a temporary barricade.
- C. If the contamination is judged as minimal based on observations and field screening, the Project Engineer may direct the contractor to proceed with over-excavation, up to a maximum of 30 cubic yards, to achieve a clean closure. Excavation and stockpiling of contaminated soils may be governed by OSHA "Hazardous Waste Operations and Emergency Response Standard 1910.12".
- D. Contaminated soil from over-excavation shall be combined with that from tank removal and stockpiled on site in a location designated by the property owner. Stock pile shall be placed on an impervious surface and covered with an impervious membrane securely fastened in place. Contaminated excavation water shall be handled and disposed in accordance with the Contractor's Contingency Plan.

### 3.11 DISPOSAL OF CONTAMINATED SOIL

- A. Responsibility for disposal of contaminated soil may be assigned to the Contractor. If directed by the Project Representative, Contractor shall collect samples from stockpiled soils following DNR recommended procedures, submit samples to lab for appropriate lab analysis, and prepare and submit to DNR an "Application To Treat Or Dispose of Petroleum Contaminated Soils", Form 4400-120. After receiving DNR approval, the contaminated soil shall be removed from the site, and properly transported and disposed.

- B. Costs related to authorized over-excavation, including additional excavation and resulting additional backfill, additional sampling and testing, permitting for disposal, and transport and disposal of contaminated soil and excavation water will be paid as an extra based on actual documented costs.

### **3.12 BACKFILLING**

- A. Following tank removal, excavations in nonpaved areas shall be backfilled with satisfactory soil materials consisting of broken concrete, clean excavation materials, or borrow fill provided by the Contractor. Borrow fill may not contain broken concrete or stones greater than 2 inch in diameter and must be free from debris, trash, frozen materials, roots and other organic matter.
- B. Excavations under roads, parking lots, sidewalks, or other paved areas shall be backfilled with materials meeting the specification for controlled backfill materials.
- C. Excavations under proposed buildings shall be backfilled with materials meeting the specifications for use under buildings.
- D. Prior to placement of fill materials, ensure that areas to be filled are free of standing water, frost, frozen materials, trash and debris.
- E. Completely fill below grade areas and voids resulting from demolition of structures and tank removal.
- F. Place fill materials in uniform horizontal layers not exceeding 6" in loose depth. Machine compact each layer at optimum moisture content of fill material to a density equal to original adjacent ground, unless subsequent excavation for new work is required.
- G. After fill placement and compaction grade surface to meet adjacent contours and to provide flow to surface drainage structures.

### **3.13 SITE RESTORATION/CLEANUP**

- A. Surface restoration in tank excavation area shall consist of the placement of least four inches of top soil in non-paved areas and crushed gravel base course in paved areas. Crushed gravel must be mechanically compacted to eight inches depth. Finish grades must conform with surrounding area.
- B. The Contractor is responsible for repairing all site damage outside the tank excavation area as directed by the Project Representative. All debris and excess materials shall be removed from the site, and waste storage areas shall be properly cleaned up and restored. Site utility systems disconnected for tank removal must be completely restored.
- C. If directed by the Project Representative, contractor shall provide repairs to bituminous concrete pavement, concrete walks, sod, seeding, or other site finishes within the tank excavation area. Site finishes shall match existing. Costs for optional site finishes will be paid as an extra based on actual documented costs.

END OF SECTION

**THIS PAGE INTENTIONALLY BLANK**