Industrial park designs for Durand

Civil and Environmental Engineering 578
Senior Capstone Design
DISCLAIMER:

The concepts, drawings and written materials provided here were prepared by students in the Department of Civil & Environmental Engineering at the University of Wisconsin-Madison as an activity in the course Civ Engr 578 – Senior Capstone Design/GLE 479 – Geological Engineering Design. These do not represent the work products of licensed Professional Engineers. These are not for construction purposes.
December 5th, 2019

Mr. Scott Rasmussen, City of Durand Administrator
2346 Engineering Hall
1415 Engineering Drive
Madison, WI 53706

RE: Front End and Technical Specs for Engineering Services of Northlands Design Company

Dear Mr. Rasmussen,

Enclosed you will find two copies of Northlands Design Company’s final design documents for the small manufacturing Industrial Park Project for the City of Durand. We are delighted to have been a part of this project and look forward to continuing our efforts with the City of Durand for the industrial park project and beyond.

Northlands Design Company has been working diligently at producing a complete set of technical specifications to encompass all disciplines of work as well as the front-end documents for the industrial park project. The documents will align with the scope of work outlined in the proposal and the site visit on September 16th, 2019. Within the documents the technical specifications outline general information, materials needed, and methods to execute construction in the field at Site B for storm water, drinking water, sanitary sewer, and transportation engineering design. The next step to completing final design will to be prepare design drawings for various implementations at Site B.

Northlands Design Company would like to express its commitment and excitement to working alongside the City of Durand, to design the Industrial Park Site for small manufacturing businesses. NDC looks forward to delivering our final design documents soon prioritizing the cities desire of economically feasibility, socially and environmental sustainability, while allowing for future expansion. If any questions or concerns arise, feel free to contact me via phone or email.

Sincerely,

[Signature]

Project Manager
Northlands Design Company
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Industrial Park Project
City of Durand Wisconsin
DURAND, WISCONSIN

GPC (General Prime Contractor) BID DOCUMENT

Division Project No. 00001

December 3rd, 2019

FOR
THE STATE OF WISCONSIN
DEPARTMENT OF ADMINISTRATION
DIVISION OF FACILITIES DEVELOPMENT
STATE OF WISCONSIN ADMINISTRATION BUILDING- 7TH FLOOR
101 EAST WILSON STREET- P.O. BOX 7866
MADISON WISCONSIN 53707

By
Northlands Design Company
1415 Engineering Hall
Madison, WI 53706
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Roadway Subgrade Preparation

Structural Excavation for Minor Structures

Rock Removal

Dewatering

Erosion Control

Sheet Piling

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GPC INVITATION TO BID  
(Rev 11/2017)
DIVISION OF FACILITIES DEVELOPMENT

CITY OF DURAND INDUSTRIAL PARK  
CITY OF DURAND  
NORTHLANDS DESIGN COMPANY  
DURAND, WI

[NOTE: BOLD project numbers and capitalize any letters used in the project numbers.]

Division Project No. 00001  
Federal Project No. 00001

BID OPENING for MEP BIDDERS: 2:00 P.M., [3/27/2020]  
BID OPENING for GENERAL PRIME CONTRACTOR BIDDERS: 2:00 P.M., [2/27/2020]

OWNER: State of Wisconsin, Department of Administration, Division of Facilities Development,  
hereinafter termed DFD.

NOTICE: Effective January 1, 2014, all potential bidders must be certified by DOA prior to submitting  
bids on state construction projects over $50,000. All bids received from contractors who are not certified  
will be rejected. Contractor certification applications and instructions for completing the form may be  
obtained from the DOA Website or upon request from DFD--email dfdcertification@wisconsin.gov.

This project is being let using a new single prime bidding and contracting process. DFD will publicly  
bid the applicable mechanical, electrical, plumbing, and fire protection (MEP) divisions of work first. Within  
5 days of the MEP bid opening, DFD will identify a lowest, qualified, responsible, certified bidder in each  
applicable MEP division of work. These successful MEP bids must be included in all general prime contractor  
bids received. No later than 5 days after DFD identifies the successful MEP bids, DFD will publicly open  
general prime contractor bids. General prime contractor bids that do not include the successful MEP  
bids will be rejected. The state will enter into a single contract with the lowest, qualified, responsible,  
certified general prime contractor and this general prime contractor will enter into subcontracts with the  
successful MEP bidders. If a project does not include any mechanical, electrical, plumbing, or fire  
protection divisions of work, DFD will bid one bid package for all work to general prime contractors.

Sealed bids will be received at Facilities Planning & Management, University of Wisconsin - Eau Claire,  
651 University Drive, Eau Claire, WI 54702-4004. The bidder is responsible for the sealed bid being  
delivered to the indicated location for receipt stamping before the time specified for the bid opening. Third  
party delivery is entirely at the bidder's risk.

In general the work consists of the development of an 85-acre site in Durand, WI. The site will need to be  
graded and leveled to prepare it for development into an industrial site. A new access road must be installed,  
totaling approximately 3,000 feet in length. Storm water systems must be installed, and screening must be  
placed to protect local residences. Additionally, approximately 4,000 feet of sanitary piping, 14,000 feet of  
water main, and a booster station must be installed for site utilities. Upon completion, a total of 11 lots must  
be ready for building construction and prepared for manufacturing companies to move in.
Bidding documents (drawings, specifications, and addenda) may be obtained only as electronic files (in PDF format): as a downloadable file from the Division’s Projects Bidding website (see website address below) and/or on compact discs or DVD by ordering from the Construction Project Bidding Opportunities webpage. Bidding documents may also be seen at various Builders' Exchanges. Additional project bidding information, including plan holders lists are available on the Division of Facilities Development public website: https://doa.wi.gov/Pages/AboutDOA/FacilitiesDevelopmentandManagement.aspx. After opening the webpage, select Current Construction Project Bidding Opportunities at the bottom of the screen.

Bidder shall identify the division of work they are bidding on when requesting Bidding Documents online.

**Base Bid will be received for: A single lump sum bid for All Work.**

No deposit is required to obtain documents for bidding purposes.

Bid Guarantee in the amount of 10% of the Bid must accompany each bid submitted.

Contract offer and construction phase records will be processed electronically on the WisBuild™ DFD Information System.

The 2017-2019 Wisconsin State Budget (2017 Wisconsin Act 59) repealed Wisconsin’s prevailing wage laws. Effective September 23, 2017, state prevailing wage requirements on state building projects no longer apply. These changes take effect for projects advertised for bid after September 23, 2017. This change does not affect the Federal Davis Bacon Act requirements.

Bidding Documents will be available online immediately upon the project being advertised for bid.

***
1. Definitions

(a) "Mechanical, electrical, or plumbing subcontractor" ("MEP Subcontractor") is a contractor that performs mechanical (Heating, Ventilating, and Air Conditioning), electrical, plumbing, or fire protection (fire suppression) work for the Project, and enters into a contract with the General Prime Contractor to perform their division of work.

(b) "Qualified bidder" means a contractor that the department certifies under Wis. Stat. s. 16.855(9m)(b)1.

(c) "Qualified responsible bidder" means a contractor who is a qualified bidder and who is a responsible bidder.

(d) "Responsible bidder" means a contractor that the department certifies under Wis. Stat. s. 16.855(9m)(b)2.

(e) "Single prime contracting" means bidding and contracting through a process in which only a general prime contractor has a contractual relationship with the state and all mechanical, electrical, or plumbing subcontractors are identified by the department and are subcontractors to the General Prime Contractor.

(f) “General Prime Contractor” is a contractor that enters into a contract with the state to perform all work as required by the Contract Documents and enters into contracts with subcontractors including MEP Subcontractors identified by DFD.
(g) “Non-MEP Subcontractor” is a subcontractor to a General Prime Contractor in divisions of work other than mechanical, electrical, plumbing, and fire protection. This includes suppliers and installers to the General Prime Contractor.

(h) “Subcontractor” is all subcontractors on a project. This includes MEP Subcontractors, subcontractors to the MEP Subcontractors, and Non-MEP Subcontractors.

(i) “Contractor” is all contractors working on a project regardless of contractual relationship. This includes the General Prime Contractor, MEP Subcontractors, Non-MEP Subcontractors, and all Subcontractors, regardless of tier of subcontract.

2. GENERAL

Time for bid opening shall be the prevailing central standard or daylight saving time in force at Madison, Wisconsin, on the date set forth in the Invitation to Bid.

All potential bidders must be certified by DOA prior to submitting bids on state construction projects over $50,000. All bids received from contractors who are not certified will be rejected. Contractor certification applications and instructions for completing the form may be obtained from the DOA Website DFD Contractor Certification page: https://doa.wi.gov/Pages/DoingBusiness/ContractorCertification.aspx or upon request from DFD--email dfdcertification@wisconsin.gov.

This project is being let using a new single prime bidding and contracting process. DFD will publicly bid the applicable mechanical, electrical, plumbing, and fire protection (MEP) divisions of work first. Within 5 days of the MEP bid opening, DFD will identify a lowest, qualified, responsible, certified bidder in each applicable MEP division of work. These successful MEP bids must be included in all general prime contractor bids received. No later than 5 days after DFD identifies the successful MEP bids, DFD will publicly open general prime contractor bids. General prime contractor bids that do not include the successful MEP bids will be rejected. The state will enter into a single contract with the lowest, qualified, responsible, certified general prime contractor and this general prime contractor will enter into subcontracts with the successful MEP bidders. If a project does not include any mechanical, electrical, plumbing, or fire protection divisions of work, DFD will bid one bid package for all work to general prime contractors.

DFD will issue an addendum if a successful MEP bid is withdrawn or rejected after the MEP Subcontractors have been identified but before the General Prime Contractor bid opening. This addendum will include a revised list of successful MEP bids that must be included in General Prime Contractor bids and will move the General Prime Contractor bid opening five days later to allow bidders sufficient time to update their bids based on the revised MEP list.

Before submitting a bid, the Bidder shall examine all of the Bidding and Contract Documents listed in the Table of Contents of these specifications. The successful Bidder will be required to do all work which is shown on the drawings, mentioned in the specifications or reasonably implied as necessary to complete the contract for this project.

The Bidder shall visit and examine the site to become acquainted with the adjacent areas, means of approach to the site, conditions of actual job site, and facilities for delivering, storing, placing, and handling of materials and equipment.

Failure to visit the site or failure to examine any and all Bidding and Contract Documents will in no way relieve the successful Bidder from the necessity of furnishing any materials or equipment, or performing any work, that may be required to complete the work in accordance with the Bidding and Contract Documents. Neglect of above requirements will not be accepted as reason for delay in the work or additional compensation.

All bidders shall have established and diligently maintained a satisfactory safety program, and if eligible for Experience Modification Rating (EMR), must have a rating of 1.20 or less as established by the Wisconsin Compensation Rating Bureau (WCRB) or the National Council on Compensation Insurance (NCCI).
3. DRAWINGS AND SPECIFICATIONS
The drawings and specifications that form a part of this contract, as stated in Article 3 of the General Conditions, are listed in the Table of Contents of these specifications.

Complete sets of Contract Documents for all trades will be issued to all Bidders, irrespective of the category of work to be bid on, in order that all Bidders may be familiar with the work of other trades as they affect their bid.

4. INTERPRETATION
No verbal explanation or instructions will be given in regard to the meaning of the drawings or specifications during the bid period. Bidders shall bring inadequacies, omissions or conflicts to the Architect/Engineer's attention at least ten (10) days before the date set for bid opening. Prompt clarification will be supplied to all bidders of record by addendum.

Failure to so request clarification or interpretation of the drawings and specifications will not relieve the successful Bidder of responsibility. Signing of the contract will be considered as implicitly denoting that the Contractor has thorough understanding of the scope of work and comprehension of the contract documents.

Neither the Architect/Engineer nor DFD will be responsible for verbal instructions.

5. MANDATORY PRE-BID DOA CERTIFICATION
All potential bidders must become certified as qualified and responsible bidders before they can bid on state projects over $50,000. The criteria for determining certification of qualified and responsible bidders are itemized in Wis. Stat. s. 16.855(9m). If DFD determines that more experience is necessary for a particular project, DFD may include additional requirements.

6. BID GUARANTEE
A bid bond prepared on the Bid Bond Form bound herein, payable to the State in the amount not less than 10% of the maximum bid shall accompany each bid as a guarantee. A bank certified check or a cashier's check may accompany each bid as a guarantee pursuant to Wis. Stat. s. 779.14(1m)(c)2.b. and 779.14(1s). Failure to enter into the contract with the state (including failure to obtain certificate of insurance and separate 100% performance and 100% payment bonds) may result in forfeiture of the Bid Bond. The company issuing the Bonds must be licensed to do business in Wisconsin.

Any bid which is not accompanied by a bid guarantee will not be accepted and will not be read at the bid opening.

All checks tendered as bid guarantee, except those of the three lowest bidders, will be returned to their makers within three (3) days after bid opening. All such retained checks will be returned immediately upon execution of the contract between the General Prime Contractor and the state.

7. WITHDRAWAL OF BIDS
Prior to the time fixed for bid opening, bids may be withdrawn by written request from the Bidder, without prejudice to the right of the Bidder to file a new bid. Withdrawn bids will be returned unopened.

After the bid has been opened, negligence on the part of the Bidder in preparing their bid confers no right for withdrawal of the bid without penalty.

If a bid contains an error, omission, or mistake, the bidder may limit liability to the amount of their bid guarantee by giving DFD written Notice, within seventy-two (72) hours of the bid opening, of their intent not to execute the contract with the state. If no such notice is given, DFD reserves the right to obtain the amount of the difference in bid price between the low bidder and the next low bidder.
8. CONTRACT FORM
These specifications include a copy of the contract the successful Bidder is required to enter into with the state. Bidders shall read and understand the conditions contained in this contract. The successful Bidder will be offered a contract through WisBuild to the contact provided by the bidder on the Bid Form.

9. CONTRACT INTERESTS BY STATE PUBLIC OFFICIALS
In accordance with section 19.45(6) of the Wisconsin Statutes, no state public official, member of a state public official's immediate family, nor any organization with which the state public official or a member of the official's immediate family owns or controls at least 10% of the outstanding equity, voting rights, or outstanding indebtedness may enter into any contract or lease involving a payment or payments of more than $3,000 within a twelve (12) month period, in whole or in part derived from state funds unless the state public official has first made written disclosure of the nature and extent of such relationship or interest to the board and to the department acting for the state in regard to such contract or lease. Any contract or lease entered into in violation of this subsection may be voided by the state in an action commenced within three (3) years of the date on which the ethics board, or the department or officer acting for the state in regard to the allocation of state funds from which such payment is derived, knew or should have known that a violation of this subsection had occurred. This subsection does not affect the application of s.946.13.

10. MINORITY BUSINESS ENTERPRISE AND DISABLED VETERAN-OWNED BUSINESS INVOLVEMENT

“Minority Business Enterprise” (MBE) means: a business certified by the Wisconsin Supplier Diversity Program under Wis. Stat. s. 16.287(2).

“Disabled Veteran-Owned Business” (DVB) means: a business certified by the Wisconsin Supplier Diversity Program under Wis. Stat. s. 16.283(3).

In awarding construction contracts, the Department of Administration shall attempt to ensure that 5 percent of the total amount expended in each fiscal year is awarded to contractors which are minority businesses, as defined under Wis. Stat. s. 16.75(3m)(a). The General Prime Contractor Bidder shall make every effort to award a minimum of 15% of the work to minority business enterprises (MBE) involvement for all projects within 60 mile radius of Milwaukee and 5% for projects located elsewhere.

In awarding construction contracts, the Department of Administration shall attempt to ensure that at least 1 percent of the total amount expended each fiscal year is awarded to contractors that are disabled veteran-owned businesses.

In order to assist the department in these endeavors we strongly encourage General Prime Contractors to use MBEs and DVBs.

General Prime Contractor Bidders shall submit a “Form A Affidavit of Compliance – Minority Business Enterprise and Disabled Veteran-Owned Business Provision” with their bid or within seven days of the general prime contractor bid opening. This form should indicate the percentage of MBE/DVB participation commitment. Submission of a completed Affidavit of Compliance is an element of responsiveness. Failure to submit this completed form within the above time limits may be considered unresponsiveness and may result in contract award to the next apparent low bidder. All MEP Subcontractor Bidders shall also make every effort to encourage MBE and DVB involvement.

Every General Prime Contractor will be required to submit a report to DFD, on a monthly basis and upon completion of the contract, which identifies the Minority Business Enterprises and Disabled Veteran-Owned Business to whom work was directly subcontracted and the value of said work. Subcontractors, material suppliers, etc. under contract to a subcontractor of a General Prime Contractor may not be used for reporting purposes under this paragraph without prior approval of the Wisconsin Supplier Diversity Program office. A MBE/DVB monthly report form will be sent to the Bidder after the Notice to Proceed is issued.
For assistance in identifying DOA certified MBE and DVB companies, please contact the Department of Administration Supplier Diversity Program at: WisDPWebApplication@wisconsin.gov, or by telephone at: (608)267-9550, or visit their website at: https://doa.wi.gov/Pages/DoingBusiness/SupplierDiversity.aspx.

11. SUBSTANCE ABUSE PREVENTION

Mission/Purpose: The State of Wisconsin recognizes and supports drug-free workplace programs as an important element in the national strategy to reduce the devastating effects of drug and alcohol abuse in our society. The State requires contractors, subcontractors, suppliers and vendors to establish and enforce drug-free workplace policies and programs that conform to Sec 103.503 of the Wisconsin Statutes.

Statement: The possession, use of, distribution or purchase of illegal drugs, or use of alcohol at work by any employee on State of Wisconsin construction job sites, is strictly prohibited.

The terms of this Substance Abuse Program Statement shall cover all construction personnel who are working on State of Wisconsin job sites. This includes employees of all Contractors, Subcontractors, contractor suppliers, and their employees working at the job site.

General Prime Contractor's and Subcontractor’s Written Program: Each General Prime Contractor and Subcontractor shall have in place a written Substance Abuse Program conforming to Sec 103.503(3) of the Wisconsin Statutes.

In addition, representatives of the State who believe that any General Prime Contractor’s or Subcontractor’s employee may be under the influence of alcohol or drugs shall, where deemed appropriate, contact the General Prime Contractor’s or Subcontractor’s appropriate management/supervision authority and request that appropriate action be taken. The General Prime Contractor's or Subcontractor’s employer shall immediately remove an employee who is suspected of being under the influence of illegal drugs or alcohol shall be immediately removed from the job site.

Procedures for testing and handling of positive drug tests shall be in compliance and consistent with State and Federal laws.

Costs of Substance Abuse Programs and Testing: The cost associated with the development, implementation and enforcement of Substance Abuse Programs and any testing required shall be the responsibility of each individual General Prime Contractor and Subcontractor for their respective employees working on the job site. The State will not be responsible for any cost of substance abuse testing, rehabilitation or medical reviews related to substance abuse.

The General Prime Contractor and Subcontractors shall indemnify and hold the State harmless from any damages or other costs incurred that are related to the implementation or enforcement of any substance abuse policy or program.

12. METHOD OF AWARD - RESERVATION

General prime contractor bids that do not include the successful MEP bids identified by DFD will be rejected.

The general prime contract will be awarded based on the following, as long as the cost does not exceed the amount of project funds available:

The lowest dollar amount is submitted by a qualified, responsible, certified bidder on a SINGLE BASE BID for all work comprising the project.

Should a qualified, responsible, certified minority business enterprise or disabled veteran-owned business submit a bid that is no more than 5% higher than the apparent low bid, the Contract may be awarded to the minority business enterprise or disabled veteran-owned business.
Firms wishing to be considered for the 5% bidding preference must be certified as a minority business enterprise or disabled veteran-owned business by the Wisconsin Supplier Diversity Program and so indicate in the space provided on the Bid Form that preference is requested.

DFD reserves the right to reject any and all bids, or to waive any informality in any bid, or to accept any bid which will serve the best interests of the State.

Unit Prices and Informational Bids will not be considered in establishing low bidder.

13. SECURITY FOR SEPARATE 100% PERFORMANCE AND SEPARATE 100% PAYMENT

Bidder is required to furnish separate 100% performance and 100% payment bonds to the benefit of the Department of Administration as the sole obligee. These bonds shall be delivered to the State with the signed contract. The Surety Company shall be licensed to do business in Wisconsin. The Bond must be dated the same date or subsequent to the date of the Contract.

A certified copy of power of attorney shall be provided by the Surety Company showing that the agent who signs the Bond has the power of attorney to sign for the Surety Company. This power of attorney must be signed by the Secretary or Assistant Secretary of the company and not by an attorney-in-fact. The power of attorney must bear the same or later date as the bond.

If the Bidder is a partnership or a joint venture, a certified list providing the names of individuals constituting the partnership or joint venture must be furnished. The Contract itself may be signed by one partner of the partnership, or one partner of each firm comprising the joint venture, but the separate Performance and Payment Bonds must be signed by all of the partners.

If the Bidder is a corporation, a current certified copy of the resolution or other official act of the directors of the corporation must be submitted showing that the person who signs the contract is authorized to sign contracts for the corporation. The corporate seal must be affixed to the resolution, contract, and separate performance and payment bonds. If the Bidder's corporation has no seal, the above documents must include a statement or notation to the effect that the corporation has no seal.

14. TAXES

The Bidder shall include in the bid, all Sales, Consumer, Use and other similar taxes required by law.

In accordance with section 71.80(16)(a), Wis. Stats., SURETY BOND: NONRESIDENT CONTRACTOR.

"All nonresident persons, whether incorporated or not, engaging in construction contracting in this state as contractor or subcontractor and not otherwise regularly engaged in business in this state, shall file a surety bond with the department (Wisconsin Department of Revenue MS 5-77 Attn: Non-Resident Surety Bonds, 2135 Rimrock Rd., Madison, WI 53713, telephone (608)266-2776) payable to the department of revenue, to guarantee the payment of income taxes, required unemployment compensation contributions, sales and use taxes and income taxes withheld from wages of employees, together with any penalties and interest thereon. The amount of the bond shall be 3% of the contract or subcontract price on all contracts of $50,000 or more..."

15. SUBMISSION OF BIDS

All bids shall be submitted on the standard Bid Forms and only bids that are made on the Bid Forms will be considered. The entire Bid Form including the Addendum Receipt/Signature page, the Bid Bond Form, (if used), and other supporting documents (if any), shall be filled out and submitted in the manner specified hereinafter. SPECIFICATIONS SHALL NOT ACCOMPANY BID.

No bids for any subdivision or any subclassification of this work, except as indicated, will be accepted. Any conditional bid, amendment to the Bid Form or appendant thereto, the inclusion of any correspondence, written or printed matter, unsolicited material or data, or details of any nature other than the information specifically called for, will disqualify the Bid. Telecommunication alterations to the bid will not be accepted.
Space is provided on the Bid Form for General Prime Contractor’s single bid. Appropriate insertions are as follows: numerals indicating the cost of the work, $0 if there is no cost for the work, or the words ‘No Bid’ if the bidder is not intending to bid the work. Blank space(s) will be considered the same as ‘No Bid’.

Bidders shall submit a Single Base Bid for all the work.

Spaces are also provided on the Bid Form for General Prime Contractor’s to list the successful MEP Subcontractors bids included in the General Prime Contractor’s single base bid.

General prime contractor bids that do not include the successful MEP bids identified by DFD will be rejected.

Any addendum issued during the time of bidding shall become a part of the Contract Documents. Bidders shall acknowledge receipt of such addendum in the appropriate space provided on the Bid Form. Bid will be rejected if receipt of an addendum applicable to the award of contract has not been acknowledged on the Bid Form.

All Bidders are encouraged to submit their bids using the SEALED BID envelope label that is provided within the specifications. DFD is not responsible for bids not clearly labeled as required. Bids shall be signed, sealed, and delivered to the place indicated in the Invitation to Bid before the time designated in the Invitation to Bid. All bids shall be identified with the Project Name, Project Number, Project Location, Category of Work being bid on, Bid Date, and the Name and Address of Bidder. Delivery to a post office box does not constitute receipt of a bid.

Bidder shall be responsible for the sealed bid being delivered to the place designated for the bid opening before the time specified. Bids received after the time indicated in the Invitation to Bid will be rejected and returned to Bidder unopened.

Bid will be considered invalid and will be rejected if it has not been signed by the Bidder.

Bids will be rejected if the bidder is not certified by DOA in the division(s) of work they bid on and/or if their bid amount exceeds their certification threshold in that division of work.

**16. BASE BID**

Base Bids shall be received as follows:

**SINGLE BASE BID FOR ALL THE WORK.**

Base Bid No. 1. All Work, as per specification Divisions 2 thru 33, applicable provisions of Division 1 and related drawings.

General prime contractor bids that do not include the successful MEP bids identified by DFD will be rejected.

**17. INFORMATIONAL BIDS**

None.

**18. UNIT PRICES**

Unit prices requested on the Bid Form shall be given and, if included in the General Prime Contract, will be used for additions to or deductions from amount of work required under the Contract. Unit prices shall include all costs of materials, labor, insurance, taxes, overhead and profit.

DFD reserves the right to reject any unit prices as given in the bid if they are considered excessive or unreasonable, or to accept any or all of the unit prices that may be considered fair and reasonable. If any unit
price is rejected, the work governed by such unit price, if required, shall be treated as specified in General
Conditions, Article entitled "Changes in the Work".

The Bidder shall refer to the Bid Form and the applicable technical section to determine the basis of unit
measure and the detailed information related to each unit price item requested.

The GPC shall list a total unit price for each item requested on the Bid Form. The total unit price listed
should be calculated by adding the unit price included with the MEP bid to the cost of any GPC work required
for that item.

19. STATED ALLOWANCES
The Bidder shall include the following cash allowances in the bid:
None.

20. SUBCONTRACTORS

GENERAL PRIME CONTRACTOR SUBCONTRACT WITH MEP SUBCONTRACTORS:
The successful General Prime Contractor will offer a subcontract to the successful MEP Subcontractors
identified by DFD and included in the General Prime Contractor’s bid. This subcontract between a General
Prime Contractor and a MEP Subcontractor must include a scope of work clause identical to the scope of
work clause included in the Bid Documents and the contract between the General Prime Contractor and the
state. A General Prime Contractor and an MEP Subcontractor may not enter any agreement in connection
with bids submitted that would alter or affect the scope or price of the contracts entered into. This
prohibition does not apply to DFD change orders that result in changes to the plans or specifications, or to
back charges allowed by the contract.

The General Prime Contractor must base the Project Schedule on the schedule that the MEP Subcontractors
and General Prime Contractors bid on (in the specifications or bid instructions), unless otherwise agreed to
by the MEP Subcontractor.

As the work progresses under any MEP subcontract for construction of a project, the General Prime
Contractor shall, upon request of a subcontractor, pay to the subcontractor an amount equal to the
proportionate value of the subcontractor's work properly completed, less retainage. The retainage shall be an
amount equal to not more than 5 percent of the subcontractor's work completed until 50 percent of the
subcontractor's work has been completed. At 50 percent completion, no additional amounts may be retained,
and partial payments shall be made in full to the subcontractor unless the department certifies that the
subcontractor's work is not proceeding satisfactorily. At 50 percent completion or any time thereafter when
the progress of the subcontractor's work is not satisfactory, additional amounts may be retained but the total
retainage may not be more than 10 percent of the value of the work completed. Upon substantial completion
of the subcontractor's work, any amount retained shall be paid to the subcontractor, less the value of any
required corrective work or uncompleted work. All payments the General Prime Contractor makes under this
paragraph shall be within 7 calendar days after the date on which the General Prime Contractor receives
payment from the department.

The contract entered into between the General Prime Contractor and an MEP Subcontractor must contain all
of the following clauses:

Scope of Work. The MEP Subcontractor scope of work is identical to the General Prime Contractor
scope of work included in these bidding and contract documents. By submitting and signing a bid,
all bidders have examined all of the Bidding Documents listed in the Table of Contents of the project
specifications. The successful bidders will be required to do all work which is shown on the
drawings, mentioned in the specifications, or reasonably implied as necessary to complete the
division of work bid for this project.
Prompt Payment. (general prime contractor) shall pay (mechanical, electrical, or plumbing subcontractor) in accordance with section 16.855(19)(b), Wisconsin stats, for work that has been satisfactorily completed and properly invoiced by (mechanical, electrical, or plumbing subcontractor). A payment is timely if it is mailed, delivered, or transferred to (mechanical, electrical, or plumbing subcontractor) by the deadline under section 16.855(19)(b), Wisconsin stats. If (mechanical, electrical, or plumbing subcontractor) is not paid by the deadline in this contract, (general prime contractor) shall pay interest on the balance due from the eighth day after the (general prime contractor) receives payment from the Department of Administration for the work for which payment is due and owing to (mechanical, electrical, or plumbing subcontractor), at the rate specified in section 71.82, Wisconsin stats., compounded monthly. A (mechanical, electrical, or plumbing subcontractor) that receives payment as provided under this contract and that subcontracts with another entity shall pay those subcontractors, and be liable for interest on late payments to those subcontractors, in the same manner as the (general prime contractor) is required to pay the (mechanical, electrical, or plumbing subcontractor) under this contract.

Insurance and Bonds. (mechanical, electrical, or plumbing subcontractor) shall not commence work under this contract until it has obtained all necessary insurance required of (mechanical, electrical, or plumbing subcontractor) in the contract between the (general prime contractor) and the Department of Administration. (mechanical, electrical, or plumbing subcontractor) shall provide a separate 100 percent performance bond and a separate 100 percent payment bond to the benefit of the (general prime contractor) as the sole named obligee. Original bonds shall be given to the (general prime contractor) and a copy shall be given to the Department of Administration no later than 10 days after execution of this contract.

Indemnification. To the fullest extent permitted by law, (mechanical, electrical, or plumbing subcontractor) shall defend, indemnify, and hold harmless (general prime contractor) and its officers, directors, agents, and any others whom (general prime contractor) is required to indemnify under its contract with the department, and the employees of any of them, from and against claims, damages, fines, penalties, losses, and expenses, including but not limited to attorney fees, arising in any way out of or resulting from the performance of the work under this contract, but only to the extent such claim, damage, fine, penalty, loss, or expense: (1) is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of property, including but not limited to loss of use resulting therefrom and is caused by the negligence, or acts or omissions, of (mechanical, electrical, or plumbing subcontractor), its subcontractors, any of their employees, and anyone directly or indirectly employed by them or anyone for whose acts they may be liable, or (2) as related to such claims, damages, fines, penalties, losses, and expense of or against (general prime contractor), results from or arises out of the negligence of the (general prime contractor) or other fault in providing general supervision or oversight of the work of (mechanical, electrical, or plumbing subcontractor) or (3) as related to claims, damages, fines, penalties, losses, and expense against the Department of Administration, arises out of the department’s status as owner of the project or project site.
In addition (mechanical, electrical, or plumbing subcontractor) shall defend, indemnify, and hold harmless (general prime contractor) and its officers, directors, agents, and any others (general prime contractor) is required to indemnify under its contract with the department, and the employees of any of them, from any liability, including liability resulting from a violation of any applicable safe place act, that (general prime contractor) or the state incurs to any employee of (mechanical, electrical, or plumbing subcontractor) or any third party where the liability arises from a derivative claim from said employee, when the liability arises out of the failure of the (general prime contractor) or the state to properly supervise, inspect, or approve the work or work area of (mechanical, electrical, or plumbing subcontractor), but only to the extent that the liability arises out of the acts or omissions of (mechanical, electrical, or plumbing subcontractor), its employees, or anyone for whom (mechanical, electrical, or plumbing subcontractor) may be liable, or from (mechanical, electrical, or plumbing subcontractor’s) breach of its contractual responsibilities or arises out of (general prime contractor’s) negligence or other fault in providing general supervision.
or oversight of (mechanical, electrical, or plumbing subcontractor’s) work or arises out of the
Department of Administration’s status as owner of the project or project site. In claims against
(general prime contractor) or the state by an employee of (mechanical, electrical, or plumbing
subcontractor) or its subcontractors or anyone for whose acts (mechanical, electrical, or plumbing
subcontractor) may be liable, the indemnification obligation of this paragraph is not limited by a
limitation on amount or type of damage, compensation, or other benefits payable by or for the
(mechanical, electrical, or plumbing subcontractor) subcontractors under workers compensation act.
Except as identified above, the obligations of (mechanical, electrical, or plumbing subcontractor)
under this indemnification do not extend to the liability of (general prime contractor) and its agents
or employees arising out of (1) preparation or approval of maps, drawings, opinions, reports,
surveys, change orders, designs, or specifications; (2) the giving of or failure to give directions or
instructions by the (general prime contractor) or the Department of Administration or their agents
or employees provided the giving or failure to give is the cause of the injury or damage; or (3) the
acts or omissions of other subcontractors.

Retainage. Retainage shall occur and be in amounts and on a schedule equal to that in the contract
between (general prime contractor) and the Department of Administration.

MEP AND NON-MEP SUBCONTRACTORS:
Bidders shall submit a completed Request for Subcontractor Approval (Form DOA-4225) with their bid or
within seven days of the general prime contractor bid opening. The Request for Subcontractor Form shall
also include, to the extent practicable, a list of their suppliers furnishing materials for the project. Submission
of a completed Request for Subcontractor Approval form is an element of responsiveness. Failure to submit
this completed form within the above time limits will be considered unresponsiveness and may result in
contract award to the next apparent low bidder. Refer to Article 11 of the General Conditions for further
information.

21. COMMENCEMENT AND COMPLETION
The successful General Prime Contractor Bidder must agree to commence the work on or before a date to be
specified in a written “Notice to Proceed” issued by the state and to fully complete all the work within 428
consecutive calendar days thereafter. Completion time will be converted to a specific date at the time the
“Notice to Proceed” is issued. Refer also to General Conditions, Article entitled “Time for Completion of the
Project.”

The General Prime Contractor must base the Project Schedule on the schedule that the MEP
Subcontractors and General Prime Contractors bid on (in the specifications or bid instructions),
unless otherwise agreed to by the MEP Subcontractor. These milestones will be incorporated into the
master project schedule after the Notice to Proceed is issued. The schedule must include, but is not limited
to, the following milestone categories as they apply to the project:

[NOTE: Milestones to be listed chronologically; Start Date and End Date follow Month/Year format.
Do NOT include specific dates. Schedule table is to be shown on one page. Allow a minimum of 60
days for bidding and contracting prior to mobilization. (Do not list bidding and contracting as a
milestone).]

<table>
<thead>
<tr>
<th>Start Date (Month/Year)</th>
<th>End Date (Month/Year)</th>
<th>Schedule Milestones</th>
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<tbody>
<tr>
<td>02/2020</td>
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<td>Mobilization</td>
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<tr>
<td>03/2020</td>
<td>07/2020</td>
<td>Excavation and Site Work</td>
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<td>07/2020</td>
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<td>05/2021</td>
<td>05/2021</td>
<td>Paving</td>
</tr>
<tr>
<td>06/2021</td>
<td>06/2021</td>
<td>Landscaping</td>
</tr>
<tr>
<td>Date</td>
<td>Project</td>
<td>Notes</td>
</tr>
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<tr>
<td>07/2021</td>
<td>Architectural Finishes</td>
<td></td>
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<tr>
<td>07/2021</td>
<td>Substantial Completion</td>
<td></td>
</tr>
</tbody>
</table>

**22. WisBuild™ DFD INFORMATION SYSTEM**

Contract offer and construction phase records including Questions, Requests for Information, Construction Bulletins, Proposals, Change Orders, Schedule of Values, and Requests for Payment will be processed electronically on the WisBuild™ DFD Information System. Other construction phase records and applications will be implemented, as they become available.

Successful Bidders shall have available for use within 72 hours of the bid date and maintain over the course of the construction phase, from date of Notice-to-Proceed through receipt of Final Payment, an Internet connection to access and utilize the WisBuild™ DFD Information System.

**23. WORK BY THE STATE**

The following work will be accomplished by DFD or will be let under separate contracts and will not be included under the General Prime Contract:

None. Contractor to furnish and supply all necessary equipment and materials to complete the project.

***
BID FORM – GENERAL PRIME CONTRACTOR (GPC) (Rev 11/2017)

DIVISION OF FACILITIES DEVELOPMENT
s.16.855 Wis. Stats.

CITY OF DURAND INDUSTRIAL PARK
CITY OF DURAND
NORTHLANDS DESIGN COMPANY
DURAND, WI

Division Project No. 00001
Federal Project No. 00001

General Prime Contractor (GPC) Bid Opening: 2:00 P.M., 27 of February, 2020.

To: State of Wisconsin, Department of Administration, Division of Facilities Development
(a joint venture)
(a corporation)
(a partnership)
(an individual)
(Cross out inapplicable)

Of
Street                    City             County                      State           Zip

hereby agree to execute a contract with the Division of Facilities Development (DFD) and a subcontract with all successful MEP Bidders identified by DFD and listed in this bid, and to furnish satisfactory separate 100% Performance Bond and 100% Payment Bond in the amount specified no later than ten (10) days of the contract offer, and to provide all labor and material required for the construction of the project designated above, for the prices hereinafter set forth, in strict accordance with the Contract Documents prepared by Northlands Design Company, 1415 Engineering Drive, Madison, WI 53706, for DFD and dated November 14, 2019.

WisBuild™ Data Information System Contact Instructions:
(For use by DFD to offer contract and activate WisBuild™ accounts to the successful bidders)

Contact name:_______________________________________
Telephone Number:___________________________________
Email address:_______________________________________
FAX Number:________________________________________

IMPORTANT: BEFORE SUBMITTING YOUR BID, PLEASE VERIFY THAT:
1. You have been certified by DOA as a qualified and responsible bidder for the amount of your bid within the division(s) of work being bid.
2. You have entered all Bid amounts in numeric characters (Example: $9,999);
3. You have acknowledged receipt of all addenda;
4. You have signed the Bid Form
5. You have included a valid Bid Guarantee for not less than 10% of the value of the bid as either:
   a) a Bid Bond signed by the contractor and surety and with a Power of Attorney attached, or
   b) a Cashier’s Check or Bank Check pursuant to Wis stats. s. 779.14(1m)(c)2.b. and 779.14(1s).
A Company or Personal Check will not be accepted.
ALL WORK

BASE BID NO 1. ALL WORK required to fully complete the project in accordance with the Contract Documents,
for the sum of ($___________________________________________________)

Enter bid amount in numeric characters only (Example: $9,999). See Instructions to Bidders ‘Article 15 Submission of Base Bids’ for detailed instructions.

UNIT PRICES (listed below are for additions to or deductions from amount of work required under the contract. See Instructions to Bidders ‘Article 18 Unit Prices’ for detailed instructions.) (Applicable to Base Bid No. 1) [Describe material and intended specific use or application.]

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit Price</th>
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<tbody>
<tr>
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<td>$_________________ Per</td>
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Enter bid amount in numeric characters only (Example: $9,999).

Base Bid No. 1 includes the bids from the following successful MEP Subcontractors identified by DFD for the mechanical, electrical, plumbing, and fire protection divisions of work in this project. The General Prime Contractor shall enter into subcontracts with these MEP Subcontractors:

Fire Suppression Base Bid No. 2:
Identified Subcontractor: N/A
Amount: N/A

Plumbing Base Bid No. 3:
Identified Subcontractor: ________________________________
Amount: ________________________________

Heating Ventilating and Air Conditioning Base Bid No. 4:
Identified Subcontractor: N/A
Amount: N/A

Electrical Base Bid No. 5:
Identified Subcontractor: N/A
Amount: N/A

INFORMATIONAL BID NO. 1-IA, (1-IB, etc.) For accounting purposes only, the following lump sum amount has been included in Base Bid No. 1 for

($___________________________________________________)

Enter bid amount in numeric characters only (Example: $9,999).
COMMENCEMENT AND COMPLETION OF CONTRACT WORK
The undersigned agrees, if awarded the contract, to enter into a subcontract with the MEP Bidders identified by DFD, and to commence the Contract work on or before a date to be specified in a written Notice to Proceed, and to complete the work in accordance with the project schedule in the Instructions to Bidders.

ADDENDUM RECEIPT
We acknowledge receipt of the following Addenda:

Addendum No.______________________________ Date _________________________
Addendum No.______________________________ Date _________________________
Addendum No.______________________________ Date _________________________
Addendum No.______________________________ Date _________________________

PRIOR TO SIGNING, BIDDERS' ATTENTION IS DIRECTED TO INSTRUCTIONS TO BIDDERS TO AVOID THE POSSIBILITY OF INVALIDATING THIS BID.

BY SIGNING THIS BID FORM, THE BIDDER ATTESTS TO PERSONAL KNOWLEDGE OF THE FOLLOWING:

1. Bidder is certified by DOA as a qualified and responsible bidder for the amount of the bid submitted, within the division(s) of work being bid.

2. In accordance with Wis. Stats. 16.855 (13) and (14) and ARTICLE 21 of these Bidding Documents, Bidder agrees to enter into a subcontract with the successful MEP Subcontractors identified by DFD.

3. Bidder has examined the drawings and specifications, carefully prepared the bid form, and has reviewed all forms in detail before submitting bid; and bidder, or the agents, officers, or employees thereof, have not, either directly or indirectly, entered into any agreement, bid rigging, bid rotation, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with this bid.

4. That all work will be performed at the Bidder's own proper cost and expense, that the Bidder will furnish all necessary materials, labor, tools, machinery, apparatus, and other means of construction in the manner provided in the applicable specifications, and at the time stated in the contract.

____________________________________  ______________________________________
(Firm Name)  (Bidder's Printed Name)

(Seal, if bid is by a corporation)  

Date: ____________________________  By ____________________________
(Signature of Bidder)

[ ] Place an "X" in the box if Bidder is certified as a minority business enterprise or disabled veteran-owned business by the Wisconsin Supplier Diversity Program and wishes to be considered for the 5% bidder preference.
From: Northalnds Design Company
1415 Engineering Dr.
Madison, WI 53706

IMPORTANT: BEFORE SUBMITTING YOUR BID, PLEASE VERIFY THAT:

1. You have been certified by DOA as a qualified and responsible bidder for the amount of your bid within the division(s) of work being bid.
2. You have acknowledged receipt of all addenda.
3. You have included all Bid amounts in numeric characters (Example: $9,999).
4. You have signed the Bid Form.
5. You have included a valid Bid Guarantee for not less than 10% of the value of the bid as either:
   a) Bid Bond signed by the contractor and surety with a Power of Attorney attached.
   b) A Company or Personal Check.

NOTE: A Company or Personal Check will not be accepted.

Project Name
____________________________________

Facilities Planning & Management

To: Facilities Planning & Management
University of Wisconsin - Eau Claire
651 University Drive
Eau Claire, WI 54702-4004

Project No.
____________________________________

Project Name
____________________________________

Bid Date
____________________________________

Bid Category
____________________________________

Location
____________________________________

Bid Date
____________________________________

Eau Claire, WI 54702-4004
University of Wisconsin - Eau Claire
651 University Drive

Northalnds Design Company
1415 Engineering Dr.
Madison, WI 53706
GENERAL PRIME CONTRACTOR (GPC) BID BOND

KNOWN ALL PEOPLE BY THESE PRESENTS, that
(a corporation of the State of ____________) (individual), (partnership) (hereinafter referred to as the "Principal"), and
a corporation of the State of ____________

Name of Surety

(thereinafter referred to as the "Surety"), are held and firmly bound unto the State of Wisconsin, for Department of Administration, Division of Facilities Development (hereinafter referred to as "DFD"), in the penal sum of ten percent (10%) of the amount of the total bid or bids of the Principal herein accepted by DFD, for the payment of which the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

The conditions of this obligation are such that, whereas the Principal has submitted, or is about to submit, to the State of Wisconsin a certain bid, including the related combined bids attached hereto and hereby made a part hereof, to enter into a Contract in writing for

Type of Work

for the ____________ Project

(1) If said bid is rejected by DFD, then this obligation shall be void; or

(2) If said bid is accepted by DFD and the Principal shall execute and deliver a Contract in the form specified by DFD (properly completed in accordance with said bid) and shall furnish a separate 100% performance bond for the Principal's faithful performance of said Contract, and a 100% payment bond for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be void; or

(3) If said bid is accepted by DFD and the Principal shall fail to execute and deliver the Contract and the performance and payment bonds noted in (2) above, all within the time specified or any extension thereof, the Principal and Surety agree jointly and severally to forfeit to DFD the penal sum mentioned above, it being understood that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal sum of this obligation as stated. Notice will be given by DFD to the Principal and Surety of intent to request payment of all or any part of the penal sum, a minimum of 7 calendar days before making demand of payment. Payment of the penal sum by the Surety and its bond shall be received by DFD within 72 hours following demand by DFD.

The Surety, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by an extension of the time within which DFD may accept such bid, and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, on the day and year set forth below.

SEAL:

Principal

Date

By:

SEAL:

Name of Surety

Date

By:

NOTE TO SURETY AND PRINCIPAL: The bid submitted, which this bond guarantees, may be rejected if the following instrument is not attached to this bond: Power of Attorney showing that the agent of Surety is currently authorized to execute bonds on behalf of the Surety, and in the amounts referenced above.
DESIGNATION OF CONFIDENTIAL AND PROPRIETARY INFORMATION

The attached material submitted in response to Bid/Proposal #000001 includes proprietary and confidential information which qualifies as a trade secret, as provided in s. 19.36(5), Wis. Stats., or is otherwise material that can be kept confidential under the Wisconsin Open Records Law. As such, we ask that certain pages, as indicated below, of this bid/proposal response be treated as confidential material and not be released without our written approval.

Prices always become public information when bids/proposals are opened, and therefore cannot be kept confidential.

Other information cannot be kept confidential unless it is a trade secret. Trade secret is defined in s. 134.90(1)(c), Wis. Stats. as follows: “Trade secret” means information, including a formula, pattern, compilation, program, device, method, technique or process to which all of the following apply:

1. The information derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use.
2. The information is the subject of efforts to maintain its secrecy that are reasonable under the circumstances.

We request that the following pages not be released.

<table>
<thead>
<tr>
<th>Section</th>
<th>Page #</th>
<th>Topic</th>
</tr>
</thead>
</table>

In the event the designation of confidentiality of this information is challenged, the undersigned hereby agrees to provide legal counsel or other necessary assistance to defend the designation of confidentiality and agrees to hold the state harmless for any costs or damages arising out of the state’s agreeing to withhold the materials.

Failure to include this form in the bid/proposal response may mean that all information provided as part of the bid/proposal response will be open to examination and copying. The state considers other markings of confidential in the bid/proposal document to be insufficient. The undersigned agrees to hold the state harmless for any damages arising out of the release of any materials unless they are specifically identified above.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Northlands Design Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorized Representative</td>
<td>Signature</td>
</tr>
<tr>
<td>Authorized Representative</td>
<td>Type or Print</td>
</tr>
<tr>
<td>Date</td>
<td>11/14/2019</td>
</tr>
</tbody>
</table>

This document can be made available in alternate formats to individuals with disabilities upon request.
Form A — Affidavit of Compliance

Project Title  Industrial Park for the City of Durand

Project Location  Cemetery Road City of Durand, WI

Project No.  000001

The State of Wisconsin has an active Diversity Business Initiative. The purpose of this initiative, in the interest of fairness and equity, is to encourage increased voluntary expenditure of State construction dollars by prime contractors under subcontracts with MBE / DVB firms. Please refer to the checklist on page 2 of this form which is provided to assist you in this effort.

To that end, the bidder’s commitment for MBE participation on this project is ______ % and DVB participation is ______ %.

The State of Wisconsin, Department of Administration, Division of Facilities Development reserves the right to reject and disqualify any bidder who does not include this completed form and who fails to comply with the State’s bid requirements as outlined in the bid specifications.

I, the apparent low bidder, acknowledge, understand and agree to comply with my commitment for MBE/DVB participation on this contract including submission of all information required.

I attest that, to the best of my knowledge, all of the above information is true and correct.

Dated (mm/dd/ccyy)  ____________________________  ____________________________  Authorized Signature

______________________________________________________________  Printed Name

______________________________________________________________  Title

______________________________________________________________  Company Name

______________________________________________________________  Telephone Number

State of  ____________________________

County of  ____________________________

On this ______ day of ______________________, 20 _____, I confirm that ____________________________

Bidder’s Name

came before me and signed the document for the purposes stated.

I witness, and set my hand and official stamp or seal.

______________________________________________________________  Notary Public

______________________________________________________________  County, State of  ____________________________

My Commission expires  ____________________________, 20 _____

This form can be made available in alternate formats to individuals with disabilities upon request.
“Good Faith Effort” To Obtain Minority Business Enterprise / Disabled Veteran-Owned Business Participation

All “Yes” boxes must be checked to ensure that a “Good Faith Effort” has been made to obtain MBE participation.

- Have you checked the State of Wis. Minority Business/Disabled Veteran-Owned Business directories?
  [https://wisdp.wi.gov](https://wisdp.wi.gov)  ☐ Yes  ☐ No

- Have you made an early (prior to bidding) contact with the Supplier Diversity Program office to solicit their assistance in getting MBE/DVB participation on the project? Tel. (608) 267-9550; Fax (608) 267-0600; email WiSDPWebApplication@wi.gov  ☐ Yes  ☐ No

- Have you provided MBE/DVB firms adequate project information about plans, specifications and requirements pertaining to their work?  ☐ Yes  ☐ No

- Have you communicated with any MBE/DVB that performs the type of services needed for the project and was there any follow-up?  ☐ Yes  ☐ No

- Was MBE/DVB participation advertised (newspaper, radio, etc.) for this project? (You may be asked to submit evidence.)  ☐ Yes  ☐ No

- Did you contact any MBE/DVB trade associations to assist in locating MBE/DVBs or have you made contact with any MBEs/DVBs that may not yet be certified by the State? (You may be asked to verify.)  ☐ Yes  ☐ No

- Have you determined if there are other possible opportunities for MBE/DVB participation such as suppliers, haulers, etc. or using a group of MBEs/DVBs jointly?  ☐ Yes  ☐ No

- Have you considered creating a plan of action with the assistance of the Supplier Diversity Program office to ensure that future contracts can have MBE/DVB participation and meet the construction requirements and goals of the State? (These plans may include mentoring, technical support and other innovative opportunities.)  ☐ Yes  ☐ No

- Did you negotiate in good faith? (You may be asked to verify.)  ☐ Yes  ☐ No
REQUEST FOR SUBMITTAL APPROVAL

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Industrial Park – City of Durand</th>
<th>DFD Project No.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor Name</td>
<td></td>
<td>Contractor Phone No.</td>
<td></td>
</tr>
<tr>
<td>Subcontractor/Supplier Name</td>
<td></td>
<td>Specification Section No.</td>
<td></td>
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</tbody>
</table>

a. This Submittal is made under the provisions of the General Conditions of the Contract Documents. The Contractor makes an express warranty to DFD, by express affirmation, that if installed into or made a part of this project, the work which forms the basis of this Submittal will conform to the design requirements of the Contract Documents.

b. It is the purpose of this Submittal to describe the goods proposed for use by the Contractor and to demonstrate conformance of that description to the Contract Documents.

c. At the time of this submission, the Contractor acknowledges awareness that the purpose of this Submittal is to obtain DFD’s authorization to use this Work for purposes of Contract Document compliance by the Contractor, and further, that DFD, in doing so, relies upon the skill, judgment and integrity of the Contractor to insure that this submitted Work complies with requirements of the Contract Documents. Contractor hereby acknowledges that it has, through the use of its own resources, found and selected the Work submitted herewith and that the Work submitted is usable for the purpose of being fit and suitable in the final construction under this Contract Documents.

d. Notwithstanding any provision of this Contract Documents to the contrary, the Contractor hereby notifies DFD that the following features of the Submittal MAY NOT BE IN CONFORMANCE with Contract Document requirements, but nevertheless asks approval thereof. (Contractor shall include brief, specific description of each potential nonconformity. If NONE, Contractor shall so state.)

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☐ Check if additional page(s) of potential nonconformity are attached.

Signed ___________________________  Contractor’s Authorized Representative

______________________________  Date

Note: Contractors are required to copy and use this form as a cover sheet accompanying all submittals, as described in the General Conditions of the Contract Documents. All pages of submittals are to be consecutively numbered, with a front index page listing the total sequence of pages included.

This form can be made available in accessible formats to qualified individuals with disabilities upon request.
# Request for Subcontractor Approval

<table>
<thead>
<tr>
<th>Contractor Name</th>
<th>Project Title</th>
<th>Street Address</th>
<th>PO Box</th>
<th>Location</th>
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<tr>
<th>City</th>
<th>State</th>
<th>ZIP + 4</th>
<th>Project Number</th>
<th>Contact Person</th>
<th>Phone Number</th>
<th>DFD Project Manager</th>
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**Prime Contractor Business Certification**

- [ ] MBE*
- [ ] DVB*

**Contract Amount $**

---

The use of any subcontractors for this project must have prior approval by DFD. □ Revised Form

**No Subcontractors will be used on this project**

<table>
<thead>
<tr>
<th>Subcontractor Name / Phone Contact Person / Email</th>
<th>City, State</th>
<th>Type of Work/Service</th>
<th>Estimated Contract Amount</th>
<th>MBE*</th>
<th>DVB*</th>
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* MBE Minority Business Enterprise / DVB Disabled Veteran-Owned Business

□ Additional Pages Attached

---

**For DFD Use Only**

**Screened By**

Date (mm/dd/ccyy)  
□ Subcontractors Approved  
□ Subcontractors Approved Except as Noted

**Project Manager**

Date (mm/dd/ccyy)

---

This form can be made available in alternate formats to individuals with disabilities upon request.
PERFORMANCE BOND (100%)

This Surety Bond instrument is hereby executed to guarantee performance of a proposed contract between the herein named Principal and the State, dated ________________, 20__, a copy of which is hereto attached and made a part hereof, herein called “Contract,” for the construction of

Project Title

Project Location

Project Number  Contract For All, General, HVAC, Roofing, Etc. work.

KNOW ALL PEOPLE BY THESE PRESENTS That

Name of Contractor of ______________________ as contractor, herein called "Principal", and ______________________

City and State Name of Surety of ______________________ as Surety, herein called ______________________

City and State

"Surety", are held firmly bound to the State of Wisconsin, for the Department of Administration, Division of Facilities Development herein called "the Owner", in the amount of $________ with the State of Wisconsin, for the faithful performance of the Contract as hereinafter set forth. For the payment of which, well and truly to be made, we bind ourselves, our heirs, successors, executors, and administrators, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that if the said bounded Principal shall promptly and faithfully perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of the Contract, in all respects, and within the time prescribed in the Contract (or as such time may be extended as provided in the Contract), and shall indemnify and save harmless the Owner, its officers, employees and agents against any direct or indirect damages of every kind and description that shall be suffered or claimed to be suffered in connection with or arising out of the performance of the Contract by Principal or its subcontractors, and shall in all respects perform the Contract according to law, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

FURTHER, that no final settlement between the Owner and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

FURTHER, that no change, extension of time, alteration or addition to the work to be performed, or amount of, the Contract shall in any way affect Principal’s or Surety’s obligations on this bond, and Surety does hereby waive notice of any change, extension of time, alterations or additions thereunder.

PROVIDED, FURTHER, that the undersigned states that pursuant to express authority the corporate seal affixed to this instrument is the seal of this surety company, that the seal was affixed and this instrument was executed for and on behalf of this surety company; that authority has not been revoked by this surety company; that this instrument was executed as the free act and deed of this surety company; that the certificate of authority from the Commissioner of Insurance showing authority of this surety company to transact business in the State of Wisconsin has been obtained and will be provided to the Owner upon request; and further, that this surety bond was written through an agent duly licensed as such on the date thereof.
IN WITNESS WHEREOF, this instrument is executed this the ____ day of ____________________, 20____.

FOR THE PRINCIPAL
By ____________________________
   Corporate Secretary Signature
   (Seal)
   Witnessed by ____________________________
   President, Partner or Individual Signature
   Witnessed by ____________________________
   Two witnesses must attest above signatures.

FOR THE SURETY
By ____________________________
   *Corporate Secretary Signature
   (Seal)
   Attorney in Fact or Authorized Officer
   Street or PO Box
   City, State and Zip Code
   Telephone Number
   Email Address
   (This email address will be used to notify Surety of Project Start Date)

ACKNOWLEDGEMENT
STATE OF ____________________________
COUNTY OF ____________________________

I, ____________________________, a Notary Public of said County and State, do hereby certify that ____________________________, Attorney-in-Fact or authorized officer of ____________________________, Name of Surety
who is personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he/she signed, sealed and delivered said instrument for and on behalf of ____________________________, Name of Surety
and purposes therein set forth.
Given under my hand and notarial seal at my office at ____________________________, __________, in said county,
this ______ day of ____________________, 20____, A.D.

____________________________________
Notary Public

My commission expires ____________________________

This Performance Bond is

APPROVED

____________________________________
Administrator, Division of Facilities Development

* If signatory is a corporation, Secretary of corporation shall attest, otherwise leave blank.
PAYMENT BOND (100%)
This Surety Bond instrument is hereby executed to guarantee payment of certain amounts related to a proposed contract between the herein named Principal and the State, dated _______________, 20__, a copy of which is hereto attached and made a part hereof, hereinafter called "Contract," for the construction of

Project Title ____________________________

Project Location ____________________________

Project Number ____________________________ Contract For ____________________________ work.

All, General, HVAC, Roofing, Etc.

KNOW ALL PEOPLE BY THESE PRESENTS That ____________________________ Name of Contractor

of ____________________________ as contractor, herein called "Principal", and ____________________________ Name of Surety

of ____________________________ City and State ____________________________ City and State

"Surety", are held firmly bound to the State of Wisconsin, for the Department of Administration, Division of Facilities Development herein called "the Owner", in the amount of $_______________ for the payment of all claims, costs, charges and other amounts arising in connection with, or related to, the Contract as hereinafter set forth. For the payment of which, well and truly to be made, we bind ourselves, our heirs, successors, executors, and administrators, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that if the said bounded Principal shall promptly make payment pursuant to Section 779.14 of the Wisconsin Statutes to all persons who supply labor and material to said project in the prosecution of the work arising in connection with, or related to, the Contract, and shall pay all other just debts, dues and demands incurred in the performance of the Contract, and shall indemnify and save harmless the Owner, its officers, employees and agents against any direct or indirect damages of every kind and description that shall be suffered or claimed to be suffered as the result of Principal's failure to pay any amounts in connection with, or related to, the Contract, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

FURTHER, labor performed and materials furnished, used or consumed in making the public improvement or performing the public work, include, without limitation because of enumeration, fuel, lumber, building materials, machinery, vehicles, tractors, equipment, fixtures, appurtenances, tools, appliances, supplies, electric energy, gasoline, motor oil, lubricating oil, greases, state imposed taxes, premiums for worker's compensation insurance and contributions for unemployment compensation.

FURTHER, that no final settlement between the Owner and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

FURTHER, that no change, extension of time, alteration or addition to the work to be performed, or amount of, the Contract shall in any way affect Principal's or Surety's obligations on this bond, and Surety does hereby waive notice of any change, extension of time, alterations or additions thereunder.

PROVIDED, FURTHER, that the undersigned states that pursuant to express authority the corporate seal affixed to this instrument is the seal of this surety company, that the seal was affixed and this instrument was executed for and on behalf of this surety company; that authority has not been revoked by this surety company; that this instrument was executed as the free act and deed of this surety company; that the certificate of authority from the Commissioner of Insurance showing authority of this surety company to transact business in the State of Wisconsin has been obtained and will be provided to the Owner upon request; and further, that this surety bond was written through an agent duly licensed as such on the date thereof.
IN WITNESS WHEREOF, this instrument is executed this the _____ day of __________________, 20__.

FOR THE PRINCIPAL
By ___________________________ By ___________________________
                        (Corporate Secretary Signature)                         (President, Partner or Individual Signature)
                        (Seal)                                                Witnessed by ___________________________
                        Witnessed by ____________________________
                        Two witnesses must attest above signatures.

FOR THE SURETY
By ___________________________
                        *Corporate Secretary Signature
                        (Seal)

                        ___________________________
                        (Attorney in Fact or Authorized Officer)
                        __________________________________________
                        (Street or PO Box)
                        __________________________________________
                        (City, State and Zip Code)
                        __________________________________________
                        (Telephone Number)
                        __________________________________________
                        (Email Address)
                        (This email address will be used to notify Surety of Project Start Date)

ACKNOWLEDGEMENT
STATE OF ____________________________
COUNTY OF ____________________________

I, ____________________________, a Notary Public of said County and State, do hereby certify that ____________________________
______________________________, Attorney-in-Fact or authorized officer of ____________________________
______________________________, Name of Surety
who is personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared
before me this day in person and acknowledged that he/she signed, sealed and delivered said instrument for and on
behalf of ____________________________, Name of Surety
for the uses and purposes therein set forth.
Given under my hand and notarial seal at my office at ____________________________, __________, in said county,
______________________________, City ____________________________, State
this _____ day of ____________________, 20____, A.D.

______________________________
Notary Public

My commission expires ____________________________

This Payment Bond is

APPROVED

______________________________
Administrator, Division of Facilities Development

* If signatory is a corporation, Secretary of corporation shall attest, otherwise leave blank.
CONSTRUCTION CONTRACT

Date ______________________
Project No. ______________________
Contract No. ______________________

THIS AGREEMENT is between the State of Wisconsin by its Department of Administration, represented by its Division of Facilities Development, herein called “DFD”, and _________________________________ doing business as _________________________________ of the City of _________________________________ and State of _________________________________ hereinafter called “CONTRACTOR”.

WITNESSETH: That for and in consideration of the payments and arrangements hereinafter mentioned, to be directed by DFD, the CONTRACTOR will commence and complete the construction described as follows:

hereinafter called the “Project”, for the sum of _________________________________ Dollars ($ ___________ .00) and all other work in connection therewith, under the terms as stated in the Contract Documents; and at the CONTRACTOR's own proper cost and expense to furnish all materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the said Project in accordance with the conditions and prices stated in the Bid Form, Bidding and Contract Requirements, the drawings which include all maps, plats, plans, and other drawings and printed or written explanatory matter thereof, and the technical portion of the specifications therefor; as prepared by _________________________________ herein called the A/E, and as enumerated in the Specification’s Table of Contents, all of which are made a part hereof and collectively evidence and constitute the Contract Documents.

The CONTRACTOR hereby agrees to commence work under this Contract on or after a date to be specified in a written “Notice to Proceed” and to complete this work by _________________________________:

DFD agrees to have the CONTRACTOR paid in current funds for the performance of the contract subject to additions and deductions, as provided in the General Conditions of the Contract, and to authorize payments on account thereof as provided in the Article entitled, "Payments to Contractor" of the General Conditions.

DFD has the delegated power and duty pursuant to Sec. 16.85(l), to act on all matters and for all purposes under this Contract; including additions and modifications therein incorporated.
IN WITNESS WHEREOF, DFD and the CONTRACTOR have executed this contract.

CONTRACTOR

(Seal)

Contractor Firm Name
Address
State, City Zip

By ________________________________
Signature                               Date

______________________________
Printed Name

______________________________
Secretary of Corp.

______________________________
Witness

______________________________
Employer Number (FEIN) or Social Security Number

This Contract is not valid or effectual for any purpose until executed by all parties, and no work is authorized until the CONTRACTOR has been given Notice to Proceed by DFD.

APPROVED (if Contract is over $150,000)

Administrator, Division of Facilities Development   Date

Governor of Wisconsin   Date

Note: If Contractor is a corporation, Secretary should attest. In accordance with current Federal IRS Regulations, all service provider entities are required to submit either their Employer Number or Social Security Number in order to receive payment for services rendered. The State of Wisconsin requests Tax ID numbers for all entities providing either goods or services, to facilitate approved payments to vendors in accordance with certain State Statutes and/or Administrative Rules.

This form can be made available in accessible formats upon request to qualified individuals with disabilities.
GENERAL CONDITIONS OF THE GENERAL PRIME CONTRACTOR CONTRACT

(REV 11/2016)

1. CONTRACT ADMINISTRATION

A. The intention of the Contract Documents is to include all labor, materials, and equipment necessary for the completion of the Work in accordance with the standard of quality established by the Contract Documents and within the allowable time period specified.

B. The General Prime Contractor shall attend a Pre-Construction Meeting, which will be scheduled by DFD. DFD shall designate DFD'S "PROJECT REPRESENTATIVE" at the Project Pre-Construction Meeting. This person is delegated authority to act on behalf of DFD, unless the Contract Documents specifically identify another party responsible for DFD Work activities. It is the intent of DFD to provide, to the extent possible, a single point of contact and communication for the General Prime Contractor to facilitate efficient, timely, and cost effective completion of the Work.

C. The General Prime Contractor shall employ, and specifically assign to the Project, a construction superintendent or foreman, experienced in Work of the character required by the Contract Documents. This person shall be delegated authority to act on behalf of the General Prime Contractor, and shall be, to the extent possible, a single point of contact and communication for DFD and all Subcontractors to facilitate efficient, timely, and cost effective completion of the Work.

D. DFD will periodically schedule progress meetings. At each such progress meeting, the parties will discuss the above-mentioned items, cooperate with others to assure successful completion of the Work, and help to quickly resolve problems which arise.

2. DEFINITIONS

THE FOLLOWING TERMS AS USED IN THE CONTRACT DOCUMENTS ARE DEFINED AS FOLLOWS:

A. "ADDENDUM" means a written or graphic instruction which clarifies, amends, or interprets the Bidding Documents.

B. "A/E" and "ARCHITECT/ENGINEER" means a person, partnership, corporation, or other business organization under Contract with DFD to prepare drawings and specifications, to advise DFD, to provide DFD with design services, and in certain cases, to perform inspection and review for the sole benefit of DFD during construction.

C. "BIDDING AND CONTRACT REQUIREMENTS" means all items as described in Division 1 including "Bidding Requirements," "Contract Forms," "General Conditions," "Supplementary General Conditions," "General Requirements."

D. "CONTRACT DOCUMENTS" means collectively, all documents listed in the Table of Contents of this Specification, the Drawings, Addenda, Change Orders, Notice to Proceed, and any changes in the Work approved by DFD and General Prime Contractor before the execution of the Contract.

E. "CONTRACTOR" means any individual, firm, corporation, or other non-governmental organization which, in cooperation with other Contractors and persons, performs Work required by the Contract Documents. “Contractor” is all contractors working on a project regardless of contractual relationship. This includes the General Prime Contractor, MEP Subcontractors, Non-MEP Subcontractors, and all Subcontractors, regardless of tier of subcontract. The term "Contractor" does not include the State or the A/E.

F. "DAMAGES FOR UNTIMELY PERFORMANCE" means a predetermined monetary amount to be paid to the State, based on anticipated real costs which the State will incur, due to the General Prime Contractor's failure to complete the Work within the allowable time identified in the Contract Documents.

G. "DELAY" means an event that causes an increase in the duration of the Project, or that changes the sequence of the Work or individual Work activities, thereby preventing completion of the Project within the time period specified in the Contract Documents.

H. "DFD" means Division of Facilities Development. (See "OWNER").
GENERAL CONDITIONS OF THE GENERAL PRIME CONTRACTOR CONTRACT

(REV 11/2016)

I. "DFD'S PROJECT REPRESENTATIVE" means the person or persons' delegated authority to act on behalf of DFD. Such person or persons may be the employees of DFD, or Consultants hired to perform the activities and responsibilities of DFD. "DFD's Project Representative" will be designated in writing at the Pre-Construction Meeting. DFD reserves the right to change its designated Project Representative at any stage of the Work, upon prior written notice to the General Prime Contractor.

J. "DRAWINGS" means the graphic and pictorial portions of the Contract Documents, showing the design, type of construction, location, dimension and character of the Work to be provided by the General Prime Contractor, generally including, but not limited to plans, elevations, sections, details, schedules, diagrams, notes and portions of Specification.

K. "EQUALS" means material, equipment or methods proposed and warranted by the General Prime Contractor as being equivalent to essential attributes of the material, equipment or method specified in the Contract Documents, and approved by DFD.

L. "EXTENDED AND UNABSORBED OVERHEAD COSTS" means extended and unabsorbed overhead costs and related damages calculated pursuant to the original and modified Eichleay formulas adopted and recognized by the Armed Services Board of Contract Appeals and the United States Court of Appeals for the Federal Circuit.

M. "FIELD ORDER" means changes in the Work made by DFD through use of direction, instruction, interpretation, determination, or any other mode or manner.

N. “GENERAL PRIME CONTRACTOR” means the individual, firm, corporation, or other non-governmental organization that enters into a contract with the state to perform all work as required by the Contract Documents and enters into contracts with subcontractors including MEP Subcontractors identified by DFD. The term "General Prime Contractor" does not include the State or the A/E.

O. “MECHANICAL, ELECTRICAL, OR PLUMBING SUBCONTRACTOR” (“MEP SUBCONTRACTOR”) is any individual, firm, corporation, or other non-governmental organization that performs mechanical (Heating, Ventilating, and Air Conditioning), electrical, plumbing, or fire protection (fire suppression) work for the Project, and is identified by DFD as the successful MEP Subcontractor to enter into a contract with the General Prime Contractor to perform their division of work described in the contract documents.

P. “NON-MEP SUBCONTRACTOR” means any subcontractor to a General Prime Contractor in divisions of work other than mechanical, electrical, plumbing, and fire protection. “Non-MEP Subcontractor” includes suppliers and installers to the General Prime Contractor.

Q. “SUBCONTRACTOR” means all subcontractors on a project. “Subcontractor” includes MEP Subcontractors, subcontractors to the MEP Subcontractors, and Non-MEP Subcontractors.

R. "NOTICE TO PROCEED" means a written notice provided by DFD to the General Prime Contractor authorizing the General Prime Contractor to proceed with the Work and establishing the date for completion of the Work.

S. "OWNER" means the State of Wisconsin, Department of Administration, Division of Facilities Development, herein termed “DFD.” DFD exercises the powers and duties prescribed by Wis. Stats. §§ 16.85 and 16.855.

T. "PROJECT" means the total and complete construction of the Work required by the Contract Documents.

U. "PROJECT SCHEDULE" means a graphic and written analysis of activity duration and sequencing, which is required for successful completion of the Project within the time period identified in the Contract Documents.

V. "SHOP DRAWINGS" means drawings, diagrams, illustrations, schedules, performance charts, brochures, catalog data, and other data or samples specially prepared or provided by the General Prime Contractor, a Subcontractor including MEP Subcontractor Non-MEP Subcontractor, or Material Supplier to illustrate some portion of the Work. The terms "SHOP DRAWINGS" and "SUBMITTALS" may be used interchangeably in the Contract Documents.
GENERAL CONDITIONS OF THE GENERAL PRIME CONTRACTOR CONTRACT  
(REV 11/2016)

W. "SPECIFICATIONS" means the Volume assembled for the Work which typically includes the Bidding and Contract Requirements, forms, and Technical Sections.

X. "STATE" means the State of Wisconsin and its officers, employees, agents, divisions, bureaus, commissions, boards, authorities, and universities, colleges, and other institutions of higher learning.

Y. "SUBMITTALS" means the terms "SUBMITTALS" and "SHOP DRAWINGS" may be used interchangeably in the Contract Documents. Refer to the definition of "SHOP DRAWINGS" contained herein.

Z. "SUBSTANTIAL COMPLETION" means the stage in the progress of the Work when DFD determines that the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Project, or designated portion thereof, can be occupied and used for its intended purpose.

AA. "SUBSTITUTIONS" means the use of material or equipment not specified in the Contract Documents, but that the General Prime Contractor proposes and warrants as suitable for the use intended and conforms to all other physical, functional, and performance requirements of the Contract Documents.

BB. "SURETY" means a person or entity licensed to do business in the State of Wisconsin, who provides separate Performance Bonds and Payment Bonds to a General Prime Contractor to indemnify the State against all damages suffered by failure of the General Prime Contractor to perform the Work and to pay all lawful claims of Subcontractors, Material Suppliers, and laborers.

CC. "WORK" means the plant, labor, materials, service, supplies, equipment, and other facilities and items comprising the whole of the Contract Documents.

3. CONTRACT DOCUMENTS

A. The Contract Documents as defined in Article 2 shall form a part of this Contract. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all.

B. The technical provisions of this Contract are set forth in the Specifications. The Specifications are complemented by the "Drawings" which may also be referred to as the "Plans." The Specifications and Drawings for this Contract are complementary and are to be so interpreted, unless that interpretation is so clearly erroneous as to defy the intent of the parties.

C. The General Prime Contractor’s bid price shall include complementary interpretation, and the performance of all Work which;

1. in accordance with industry standards, customary practice, or by reasonable inference are details of Work that are necessary as part of the construction, operation, and coordination and interface of the Work;

2. would necessarily be readily apparent to one skilled in the trades; or,

3. a competent and experienced contractor would recognize as part of its responsibility.

D. The failure of the General Prime Contractor to include in its bid the Work as defined in Paragraph 3.B. shall not relieve the General Prime Contractor from performing such Work and it shall be performed as if fully and correctly set forth and described in the Drawings and Specifications.

E. Periodically, DFD may provide the General Prime Contractor additional instructions and drawings necessary to perform the Work. DFD shall make a good faith effort to coordinate such instructions and drawings with the Contract Documents, preparing them so they can be reasonably interpreted as a part thereof.
4. CONFLICTING CONDITIONS

A. DFD shall take all reasonable steps to assure that the Contract Documents are as accurate as possible, and provide information which, in the opinion of DFD, is necessary in preparing bids and constructing the Project. However, it is mutually understood that discrepancies or conflicts in the Contract Documents may be identified, in which case:

1. Amendments and addenda take precedence over the Specifications;
2. The Specifications take precedence over the Drawings;
3. Stated dimensions take precedence over scaled dimensions;
4. Large-scale detail drawings take precedence over small-scale drawings;
5. Schedules take precedence over other data on the plans.

B. Notwithstanding the above order of precedence, any clearly stated requirement of duties of the General Prime Contractor shall control over any rule of contract interpretation which might otherwise place those duties in conflict with other provisions of the Contract, and such duties shall be included in the General Prime Contractor’s bid.

C. The failure to inquire about any ambiguity in any provision of the Contract Documents which would be reasonably apparent to any bidder knowledgeable and skilled in the Work required by the bid shall grant DFD the right to interpret that ambiguity.

D. Where the terms “A/E,” “Architect/Engineer,” “Architect,” or “Engineer” are used in technical Sections of the Specifications, the General Prime Contractor shall understand that actions indicated to be accomplished by such named parties are actions which are solely as the professional technical advisor and consultant to DFD and such actions thus require final approval by DFD.

E. In the event of any conflict between the terms of this Contract and any provision of law, the provision of law shall control and the parties hereto shall not be free to Contract contrary to law.

5. CONTRACT SECURITY

A. The General Prime Contractor shall furnish a Performance Bond in an amount equal to one hundred percent (100%) of the Contract price, and a Payment Bond in an amount equal to one hundred percent (100%) of the Contract price, as security for the faithful performance of this Contract, payment of all persons performing labor or furnishing materials for the Project, and payment of all other debts incurred in the performance of the Work.

B. The Performance Bond and Payment Bond Forms that the General Prime Contractor is required to execute are bound into the Specifications. Before the Construction Contract can be executed, the Performance Bond and Payment Bond must be delivered to and approved by DFD. Such approval will be predicated on prior satisfactory performance of a Surety.

6. SAFETY AND ACCIDENT PREVENTION

A. The General Prime Contractor shall provide and maintain a Work environment and procedures which will:

1. Safeguard the public and State personnel and agents, property, material, supplies, and equipment exposed to General Prime Contractor and all Subcontractors including, MEP Subcontractors and Non-MEP Subcontractors operations and activities;
2. Avoid interruptions of user agency operations and delays in Contract completion dates; and,
3. Control costs in the performance of this Contract.

B. For these purposes, the General Prime Contractor shall:
GENERAL CONDITIONS OF THE GENERAL PRIME CONTRACTOR CONTRACT  
(REV 11/2016)

1. Provide appropriate safety barricades, signs, and signal lights;

2. Comply with any safety requirement published by any governmental authority with jurisdiction over the site, including Federal, State, or local jurisdictions;

3. Ensure that any additional measures which are reasonably necessary for the purposes stated are taken.

C. The General Prime Contractor shall strictly comply with, and bear full responsibility for, any safety procedure set forth in the Contract Documents. In the absence of such compliance, the General Prime Contractor shall be responsible for indemnification of the State for any cost or expense, including legal fees. At the discretion of DFD, the General Prime Contractor may also be subject to termination of the Contract for default.

D. If DFD becomes aware of any noncompliance by the General Prime Contractor or any Subcontractor, with the safety conditions of this Contract or of any condition caused by the General Prime Contractor or any Subcontractor, which poses a serious or imminent danger to the health or safety of the public or to State personnel, DFD's Project Representative shall notify the General Prime Contractor orally, with written confirmation, and direct immediate initiation of corrective action. This Notice, when given to the General Prime Contractor or the General Prime Contractor's Representative at the Work site, shall be deemed sufficient notice of noncompliance and that corrective action is required. After receiving the Notice, the General Prime Contractor shall immediately take corrective action. If the General Prime Contractor fails or refuses to promptly take corrective action, DFD may issue an order stopping all or part of the Work until satisfactory corrective action has been taken. The General Prime Contractor shall not be entitled to an equitable adjustment of the Contract price or an extension of the performance schedule by reason of the issuance of any stop Work order under this Article 6.

E. The General Prime Contractor shall cause this Article 6, including this Paragraph E., with appropriate changes in paragraph designation, to be incorporated in all MEP Subcontracts and Non-MEP Subcontracts, regardless of tier.

7. PROTECTION OF WORK AND PROPERTY

A. The General Prime Contractor shall at all times safely guard State property and adjacent property from injury, loss, release of hazardous or toxic materials, or damage in connection with the Contract Documents or the performance of the Work hereunder. The General Prime Contractor shall replace or make good any damage, loss, or injury caused as a result of failure to comply with Contract Documents. This contract provision shall be incorporated into the contracts between the General Prime Contractor, MEP Subcontractors, and Non-MEP Subcontractors.

B. In case of an emergency which threatens loss or injury of property, or safety of life, the General Prime Contractor will be allowed to act, without previous instructions from DFD, in a diligent manner. The General Prime Contractor shall notify DFD immediately thereafter. Any claim for compensation by the General Prime Contractor due to such extra Work shall be promptly submitted to DFD for approval as provided for in Article 18 of the General Conditions.

C. In the event of temporary suspension of Work, or during inclement weather, or whenever DFD shall direct, the General Prime Contractor shall carefully protect all Work and materials against damage or injury from the weather. This contract provision shall be incorporated into the contracts between the General Prime Contractor, MEP Subcontractors, and Non-MEP Subcontractors. If, in the opinion of DFD, any Work or materials have been damaged or injured by reason of failure on the part of the General Prime Contractor Subcontractors including MEP Subcontractor or Non-MEP Subcontractors to protect the Work, such materials shall be removed and replaced at the expense of the General Prime Contractor.

D. The General Prime Contractor shall promptly, and without prior demand by DFD, remedy and repair any damage caused by the General Prime Contractor and all Subcontractors, suppliers, and vendors to completed or partially completed construction or to property of DFD or other Subcontractors.
8. PERMITS, REGULATIONS, UTILITIES, AND TAXES

A. The General Prime Contractor shall procure all permits, licenses, and approvals necessary for the execution of this Contract and performance of the Work, and shall provide evidence of such permits, licenses, and approvals at the Pre-Construction Meeting or before commencement of the Work.

B. Where Contract Documents require abatement of asbestos containing materials, prior written Notice to the State of Wisconsin, Department of Natural Resources is required. The General Prime Contractor shall provide evidence of such Notice prior to commencement of the Work.

C. Work under this Contract shall be in compliance with all applicable state laws, codes, and regulations relating to environmental quality and safety, the performance of the Work, the protection of adjacent property, and the maintenance of passageways, guard fences, or other protective facilities. Such Work shall not be subject to the ordinances or regulations (except land use zoning) of the municipality in which the construction takes place, including ordinances or regulations relating to materials used, permits, supervision of construction or installation, payment of permit fees, or other restrictions of any nature whatsoever. DFD shall be notified by the General Prime Contractor of any Notices of noncompliance or violation associated with Work required by the Contract Documents.

D. The General Prime Contractor shall pay all Sales, Consumer, Use, and other similar taxes required by law assessed to or arising out of the construction of the Project.

E. If the General Prime Contractor believes that any of the Work required by the Contract Documents is in violation of any State law, code, rule, or regulation, the General Prime Contractor shall promptly notify DFD. Upon such notification, DFD will determine whether corrective action is required and make such changes, if any, at no additional cost to the General Prime Contractor provided such violation was not caused by the General Prime Contractor or a Subcontractor including, a MEP Subcontractors, or a Non-MEP Subcontractors.

F. Charges for water, sewer, and other utility connections made by municipalities will be paid by the State. Payment for use of such services and utilities before Substantial Completion shall be in accordance with provisions of the General Requirements of the Contract.

9. STATE RESPONSIBILITY FOR THE SITE

A. Prior to start of construction, the State shall furnish all land and rights-of-way necessary for the carrying out and completion of the Work to be performed under this Contract.

B. DFD will furnish to the General Prime Contractor site, topography, and property surveys which DFD reasonably believes necessary for the execution of the Work.

C. DFD, upon receipt of the Notice set forth in Paragraph 10.E., shall promptly investigate the site conditions reported by the General Prime Contractor to determine whether the conditions discovered differ materially from those indicated in the Contract Documents, are of an unknown and unusual nature which could not have been discovered by a reasonable site investigation by the General Prime Contractor as required by the Contract Documents, or which differ materially from those ordinarily encountered and generally recognized as being inherent in the Work of the character required by the Contract Documents at the site where Work is to be performed.

D. DFD shall act on any General Prime Contractor Notice, as described in Paragraph 10.E. of the General Conditions, as soon as practicable, but in no case later than ten (10) working days after the receipt of such Notice. If DFD determines that the conditions reported by the General Prime Contractor differ materially from those indicated in the Contract Documents, or are of an unknown and unusual nature which could not have been discovered during a reasonable site investigation by the General Prime Contractor as required by the Contract Documents, or which differ materially from those ordinarily encountered and generally recognized as being inherent in the Work of the character required by the Contract Documents at the site where Work is to be performed,

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E. No request by the General Prime Contractor for an equitable adjustment to the Contract under this Article 9 shall be allowed, unless the General Prime Contractor gives proper Notice, which is a CONDITION PRECEDENT to any liability on the part of the State.
F. In no event shall any claim by the General Prime Contractor for equitable adjustment to the Contract for differing site conditions be allowed if presented after final payment under this Contract is made.

10. GENERAL PRIME CONTRACTOR RESPONSIBILITY FOR CONDITIONS AT THE SITE

A. The General Prime Contractor is responsible for and hereby acknowledges that it has taken the steps reasonably necessary to prepare a bid which includes the costs for Work, the requirement for which would reasonably be known to a competent contractor, in overcoming normal subsurface conditions at the site where the Work is to be performed and in order to accomplish the Work described in the Contract Documents. Additionally, the General Prime Contractor certifies that it has investigated the site and satisfied itself as to the general and local conditions which affect the Work or its cost, including, but not limited to:

1. Conditions bearing upon transportation, disposal, handling, and storage of materials;
2. The availability of labor, water, electric power, and roads or access;
3. Uncertainties of weather, river stages, tides, or similar physical conditions at the site;
4. The conformations and conditions of the ground; and
5. The character of facilities and equipment as represented by the Contract Documents.

B. The General Prime Contractor also acknowledges that it has satisfied itself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, and information included in the Contract Documents.

C. Any failure of the General Prime Contractor to take the actions described and acknowledged in this Article 10 will not relieve the General Prime Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the Work, or for proceeding to successfully perform the Work without additional expense to the State.

D. The State assumes no responsibility for any erroneous conclusions or interpretations made by the General Prime Contractor based on the information made available by DFD. If an analysis of such data is only meaningful to a person skilled in the geotechnical sciences, then the General Prime Contractor is responsible for, and certifies that it has obtained, such an analysis or has otherwise decided that the data is understandable by it, as presented. The State assumes no responsibility for any understanding reached or representation made concerning conditions which can affect the Work by any of its officers, representatives, or agents before the execution of this Contract, unless that understanding or representation is expressly stated in the Contract Documents.

E. If the General Prime Contractor discovers, in the performance of the Work, a subsurface or latent physical condition at the site, including but not limited to possible environmental contamination or hazardous substances, which it did not discover pursuant to this Article 10, then the General Prime Contractor shall promptly, and before the condition is disturbed, give written Notice to DFD. Such Notice shall be subject to the procedures and limitations set forth in Article 20 hereof, entitled "Notice Requirements. The General Prime Contractor shall disclose in such Notice all the facts and circumstances then known to it, including the impact of such condition on the price, time, or quality of the Work remaining to be done.

11. SUBCONTRACTS

A. The General Prime Contractor must subcontract with all successful MEP Subcontractors identified by DFD. The General Prime Contractor may enter into subcontracts for work other than MEP Subcontractor work, if subcontractors are approved by DFD through the Request for Subcontractor Approval Form. However, the election to subcontract Work shall not relieve the General Prime Contractor from responsibility or liability which it has assumed under this Contract. The General Prime Contractor shall remain liable to the same extent that its liability would attach, as if the Work had been performed by the General Prime Contractor's own employees. If the Specifications require or otherwise designate only one Subcontractor or source of supply for Work required under the Contract Documents, the General Prime Contractor's failure to acquire suitable Contract arrangements with such Subcontractor or source of
supply shall not excuse the General Prime Contractor from full responsibility and liability for any failure or default of such source of supply.

B. All Non-MEP Subcontractors are subject to DFD approval. DFD may request, or the General Prime Contractor may provide, any of the following information to substantiate the proposed Subcontractors’ qualifications or ability to perform the Work. DFD shall consider such information when reviewing the qualifications of proposed Subcontractors to determine whether such qualifications serve the best interests of the Project.

1. The amount of experience completing similar Work to that required by the Contract Documents;
2. The quality of Work the proposed Subcontractor has provided on past Projects;
3. The extent of available staffing and financial resources of the proposed Subcontractor;
4. The General Prime Contractor's intended method of monitoring the proposed Subcontractor’s Work;
5. The level of supervision of the Subcontractor's Work which the General Prime Contractor will provide;
6. Any other information regarding the proposed Subcontractor's ability to complete the Work.

C. Bidders shall submit a completed Request for Subcontractor Approval Form with their bid or within seven days of the general prime contractor bid opening. Submission of a completed Request for Subcontractor Approval Form is an element of responsiveness. Failure to submit this completed form within the above time limits will be considered unresponsiveness and may result in contract award to the next apparent low bidder. When no Subcontractors are anticipated, the General Prime Contractor shall give DFD notice of this fact on the Form within the time limits noted above.

D. The General Prime Contractor shall not replace any DFD identified or approved Subcontractor or material supplier without written approval of DFD. Any General Prime Contractor request for replacement of a Subcontractor previously approved by DFD shall include the reason(s) for such replacement and all documentation necessary to substantiate such change.

E. The General Prime Contractor agrees, to the extent practicable, to maintain a list of all Subcontractors and suppliers performing labor or furnishing materials for the project.

F. The General Prime Contractor shall be fully responsible for all acts and omissions of all Subcontractors and shall be responsible for scheduling and coordinating the Work of all Subcontractors, including MEP Subcontractors, Non-MEP Subcontractors and material suppliers.

G. Nothing herein shall be construed to create any express or implied Contractual relationship between DFD and any of the General Prime Contractor's MEP Subcontractors, Non-MEP Subcontractors, suppliers or vendors.

H. Notwithstanding Paragraphs 11.C. and 11.D., the General Prime Contractor shall insert the following mandatory provisions in all subcontracts with Subcontractors:

1. All provisions of this Article 11
2. Article 26 - Payments to General Prime Contractor
3. Article 27 - Payments by General Prime Contractor
4. Article 32 - Nondiscrimination/Affirmative Action
5. Article 33 - Minimum Wages

The General Prime Contractor shall include the mandatory provisions in Article 12 MEP SUBCONTRACTORS in all MEP subcontracts.
12. MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION (MEP) SUBCONTRACTORS

A. The General Prime Contractor will offer a subcontract to the successful MEP Subcontractors identified by DFD and included in the General Prime Contractor’s bid. This subcontract between a General Prime Contractor and an MEP Subcontractor must include a scope of work clause identical to the scope of work clause included in the Bid Documents and the contract between the General Prime Contractor and the state (see item D below). A General Prime Contractor and an MEP Subcontractor may not enter any agreement in connection with bids submitted that would alter or affect the scope or price of the contracts entered into. This prohibition does not apply to DFD change orders that result in changes to the plans or specifications, or to back charges allowed by the contract. The General Prime Contractor shall base its project schedule on the schedule in the specifications or bid instructions unless otherwise agreed to by the MEP Subcontractor.

B. Pursuant to Wis. Stat. §16.855 (14m)(a), The contract entered into between the General Prime Contractor and an MEP Subcontractor must contain all of the following clauses:

**Prompt Payment.** (general prime contractor) shall pay (mechanical, electrical, or plumbing subcontractor) in accordance with section 16.855(19)(b), Wisconsin stats, for work that has been satisfactorily completed and properly invoiced by (mechanical, electrical, or plumbing subcontractor). A payment is timely if it is mailed, delivered, or transferred to (mechanical, electrical, or plumbing subcontractor) by the deadline under section 16.855(19)(b), Wisconsin stats. If (mechanical, electrical, or plumbing subcontractor) is not paid by the deadline in this contract, (general prime contractor) shall pay interest on the balance due from the eighth day after the (general prime contractor) receives payment from the Department of Administration for the work for which payment is due and owing to (mechanical, electrical, or plumbing subcontractor), at the rate specified in section 71.82, Wisconsin stats., compounded monthly. A (mechanical, electrical, or plumbing subcontractor) that receives payment as provided under this contract and that subcontracts with another entity shall pay those subcontractors, and be liable for interest on late payments to those subcontractors, in the same manner as the (general prime contractor) is required to pay the (mechanical, electrical, or plumbing subcontractor) under this contract.

**Insurance and Bonds.** (mechanical, electrical, or plumbing subcontractor) shall not commence work under this contract until it has obtained all necessary insurance required of (mechanical, electrical, or plumbing subcontractor) in the contract between the (general prime contractor) and the Department of Administration. (mechanical, electrical, or plumbing subcontractor) shall provide a separate 100 percent performance bond and a separate 100 percent payment bond to the benefit of the (general prime contractor) as the sole named obligee. Original bonds shall be given to the (general prime contractor) and a copy shall be given to the Department of Administration no later than 10 days after execution of this contract.

**Indemnification.** To the fullest extent permitted by law, (mechanical, electrical, or plumbing subcontractor) shall defend, indemnify, and hold harmless (general prime contractor) and its officers, directors, agents, and any others whom (general prime contractor) is required to indemnify under its contract with the department, and the employees of any of them, from and against claims, damages, fines, penalties, losses, and expenses, including but not limited to attorney fees, arising in any way out of or resulting from the performance of the work under this contract, but only to the extent such claim, damage, fine, penalty, loss, or expense: (1) is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of property, including but not limited to loss of use resulting therefrom and is caused by the negligence, or acts or omissions, of (mechanical, electrical, or plumbing subcontractor), its subcontractors, any of their employees, and anyone directly or indirectly employed by them or anyone for whose acts they may be liable, or (2) as related to such claims, damages, fines, penalties, losses, and expense of or against (general prime contractor), results from or arises out of the negligence of the (general prime contractor) or other fault in providing general supervision or oversight of the work of (mechanical, electrical, or plumbing subcontractor) or (3) as related to claims, damages, fines, penalties, losses, and expense against the Department of Administration, arises out of the department’s status as owner of the project or project site. In addition (mechanical, electrical, or plumbing subcontractor) shall defend, indemnify, and hold harmless (general prime contractor) and its officers, directors, agents, and any others (general prime contractor) is required to indemnify under its contract with the department, and the employees of any of them, from any liability, including
liability resulting from a violation of any applicable safe place act, that (general prime contractor) or the state incurs to any employee of (mechanical, electrical, or plumbing subcontractor) or any third party where the liability arises from a derivative claim from said employee, when the liability arises out of the failure of the (general prime contractor) or the state to properly supervise, inspect, or approve the work or work area of (mechanical, electrical, or plumbing subcontractor), but only to the extent that the liability arises out of the acts or omissions of (mechanical, electrical, or plumbing subcontractor), its employees, or anyone for whom (mechanical, electrical, or plumbing subcontractor) may be liable, or from (mechanical, electrical, or plumbing subcontractor’s) breach of its contractual responsibilities or arises out of (general prime contractor’s) negligence or other fault in providing general supervision or oversight of (mechanical, electrical, or plumbing subcontractor’s) work or arises out of the Department of Administration’s status as owner of the project or project site. In claims against (general prime contractor) or the state by an employee of (mechanical, electrical, or plumbing subcontractor) or its subcontractors or anyone for whose acts (mechanical, electrical, or plumbing subcontractor) may be liable, the indemnification obligation of this paragraph is not limited by a limitation on amount or type of damage, compensation, or other benefits payable by or for the (mechanical, electrical, or plumbing subcontractor) subcontractors under workers compensation act.

Except as identified above, the obligations of (mechanical, electrical, or plumbing subcontractor) under this indemnification do not extend to the liability of (general prime contractor) and its agents or employees arising out of (1) preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or specifications; (2) the giving of or failure to give directions or instructions by the (general prime contractor) or the Department of Administration or their agents or employees provided the giving or failure to give is the cause of the injury or damage; or (3) the acts or omissions of other subcontractors.

Retainage. Retainage shall occur and be in amounts and on a schedule equal to that in the contract between (general prime contractor) and the Department of Administration.

C. Pursuant to Wis. Stat. § 16.855(19)(b), Retainage between General Prime Contractor and MEP Subcontractors is governed as follows:

As the work progresses under any MEP subcontract for construction of a project, the general prime contractor shall, upon request of a subcontractor, pay to the subcontractor an amount equal to the proportionate value of the subcontractor’s work properly completed, less retainage. The retainage shall be an amount equal to not more than 5 percent of the subcontractor’s work completed until 50 percent of the subcontractor’s work has been completed. At 50 percent completion, no additional amounts may be retained, and partial payments shall be made in full to the subcontractor unless the department certifies that the subcontractor’s work is not proceeding satisfactorily. At 50 percent completion or any time thereafter when the progress of the subcontractor’s work is not satisfactory, additional amounts may be retained but the total retainage may not be more than 10 percent of the value of the work completed. Upon substantial completion of the subcontractor’s work, any amount retained shall be paid to the subcontractor, less the value of any required corrective work or uncompleted work. All payments the general prime contractor makes under this paragraph shall be within 7 calendar days after the date on which the general prime contractor receives payment from the department.

D. Pursuant to Wis. Stat. § 16.855(14m)(b), the MEP Subcontracts must include a scope of work clause that is identical to the scope of work clause on which the MEP Subcontractor bid. The following Scope of Work language shall be included in the contracts between the General Prime Contractor and MEP Subcontractors:

Scope of Work. The MEP Subcontractor scope of work is identical to the General Prime Contractor scope of work included in these bidding and contract documents. By submitting and signing a bid, all bidders have examined all of the Bidding Documents listed in the Table of Contents of the project specifications. The successful bidders will be required to do all work which is shown on the drawings, mentioned in the specifications, or reasonably implied as necessary to complete the division of work bid for this project.
13. SCHEDULING AND COORDINATION OF WORK

A. The General Prime Contractor has the full and complete responsibility for the accomplishment of all Work within the specified time indicated in the Contract Documents, except where the Contract Documents explicitly and specifically place a limited duty for completion on the State.

B. DFD and the General Prime Contractor hereby commit themselves to good faith negotiation, coordination, and cooperation to assure the timely completion of the Project. By accepting this Contract, the General Prime Contractor agrees that scheduling, coordination, and monitoring activity for All Work will be placed under the direct control and supervision of a person experienced in construction scheduling, means and methods. If such experience and knowledge must be obtained by Contracting with a separate scheduling consultant, the entire cost of such consultant shall be borne by the General Prime Contractor. Additionally, the General Prime Contractor fully agrees to cooperate in all respects with all Subcontractors, including MEP Subcontractors, Non-MEP Subcontractors, and suppliers to provide all data required, and shall coordinate the activities of its own Work forces and the Work forces of the Subcontractors, in such manner and at such time as to not cause a delay in the Project.

C. The General Prime Contractor and the State shall be given the opportunity to schedule its own Work as conveniently as is consistent with the overall needs of the Project Schedule.

D. The General Prime Contractor shall afford the State and any other parties performing Work on the Project, reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities at the site.

E. The Project Schedule shall incorporate all activities, events, and milestones required for successful Project completion within the allowable time for completion specified in the Contract Documents. The General Prime Contractor shall prepare a breakdown of all Work activities or events, whether the activities are to be performed by the General Prime Contractor's own forces, those of Subcontractors, including MEP Subcontractors and Non-MEP Subcontractors, or the State, indicating the proposed duration and sequencing of such activities for successful completion of the Project within the allowable time specified in the Contract Documents. The General Prime Contractor shall also identify whether any Work activity or event is dependent on the Work of its own forces or with those of the State. The failure to list any activity or to perform any other duty required by or incident to that required by these General Conditions shall not be the basis of a claim for adjustment of any provision of this Contract, or of any other type of claim whatsoever.

F. The General Prime Contractor shall, within fourteen (14) calendar days from the Notice to Proceed, develop and publish a Project Schedule for the first sixty (60) calendar days of the Project. The completed Project Schedule, for all Work activities through Project completion, shall be developed and published within this sixty (60) day period. Pursuant to 16.855 (14m)(d), the General Prime Contractor must base this Project Schedule on the schedule that the MEP Subcontractors and General Prime Contractors bid on (in the specifications or bid instructions), unless otherwise agreed to by the MEP Subcontractor. No provision of this Contract shall be construed to relieve the General Prime Contractor of this requirement Monthly updates of the schedule shall be developed, analyzed and published and each subsequent update shall include a breakdown of major activities to be performed by each separate Contractor or entity, and all activities required for development, monitoring, and updating the Project Schedule.

G. If the General Prime Contractor's Work depends upon construction or operations by the State, the General Prime Contractor shall, prior to proceeding with that portion of the Work, promptly give Notice to DFD of any apparent deficiencies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the General Prime Contractor to so report shall constitute an acknowledgment that the State’s completed or partially completed construction is fit and proper to receive the General Prime Contractor's Work, except as to defects not then reasonably discoverable.

H. The General Prime Contractor shall identify forthwith any critical event which will require DFD to act or to refrain from acting, or critical time periods within which the State must complete activities or Work for which DFD is responsible under the Contract. Timely Notice of any such identified event or time period shall be given to DFD. The giving of such Notice is a CONDITION PRECEDENT to the creation of any duty of DFD to take any action or to refrain from taking any action. The failure of the General Prime Contractor to give such Notice forthwith shall
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thereafter bar and preclude any claim by the General Prime Contractor for adjustment of any Contract provision or claim predicated on the breach of any obligation by DFD.

I. Where any Work activity required for completion of the Project, is completed in less time than that required, anticipated, or otherwise allowed by the Project Schedule, the unused time, hereinafter called Float, shall belong to the Project, to be used by the General Prime Contractor as the Project needs determine, including but not limited to providing additional time for completion of any other Work activities required for completion of the Project. Float shall not be considered owned, subject to the exclusive use, or management by any of the interested participants. No claim against DFD or the General Prime Contractor shall be made by any party for the loss of Float time.

J. The General Prime Contractor shall be independently responsible for resolving any time related matters with Subcontractors, including MEP Subcontractors, Non-MEP Subcontractors, suppliers, or others who may furnish supplies or services on the Project, as a result of Contractual relations with the General Prime Contractor. No liability shall attach to the State, for the failure of any party to carry out the coordination and scheduling responsibilities which they have assumed under this Article 13.

K. The General Prime Contractor is hereby put on Notice that failure to furnish data or cooperate in good faith is a MATERIAL BREACH OF CONTRACT and may be the basis for a Termination for Default under the procedures set forth in these General Conditions. In such cases DFD, in addition to, and not in lieu of the right to termination for default, may acquire the services of a scheduling specialist to perform any such duties and charge the cost thereof to the General Prime Contractor. In the event that DFD is required to acquire any replacement scheduling services, the General Prime Contractor shall conform to any revised schedule resulting therefrom.

L. In addition to the criteria set forth in these General Conditions, the full and complete performance of duties required to be performed under this Article 13, is a CONDITION PRECEDENT to the right of the General Prime Contractor to payment of any sums due. In the event of any delays by the General Prime Contractor or other breach hereof which gives rise to penalties and/or damages to the State, then in any such event DFD may offset such penalties and damages against the sums due or to become due the General Prime Contractor hereunder.

M. The bonds furnished to secure these commitments shall be applicable to each and every one of these time and scheduling commitments and may be enforced by any person or entity who is entitled to enforce the bonds as a matter of law and who is damaged as a result of breach of these commitments by the General Prime Contractor on the Project to which these provisions apply. The State shall not be responsible for the default of the General Prime Contractor and the remedies of any damaged party shall be limited to an action by the damaged party against the defaulting General Prime Contractor and/or its bonding company, in addition to any other coverage for the bond.

N. The General Prime Contractor is cautioned that the reporting requirements specified in or for the Schedule Requirements, are in addition to any such similar requirements set forth in the Articles hereof entitled, "REPORTS, RECORDS AND DATA", "QUALITY CONTROL & INSPECTION", and "NOTICE".

O. In the event it becomes necessary to interpret this Article 13, the construction or interpretation shall strive to achieve the purpose for which this Article 13 was designed to accomplish, i.e. timely, effective and efficient performance of the Work under the Contract within the allowable time identified in the Contract Documents, and at no extra cost or inconvenience to any party, if at all possible.

14. GENERAL PRIME CONTRACTOR’S OBLIGATIONS AND SUPERINTENDENCE

A. The General Prime Contractor shall provide and pay for all materials, labor, tools, equipment, transportation, and superintendence necessary to execute, complete, and deliver the Work within the specified time.

B. Where technically and economically feasible, the General Prime Contractor shall use the least hazardous materials, equipment, and processes to execute the Work. If materials are used which are considered an OSHA hazardous material, the General Prime Contractor shall comply with all OSHA rules and regulations.

C. No materials or supplies which are to become part of the Work shall be purchased by the General Prime Contractor or by any Subcontractor, including MEP Subcontractor or Non-MEP Subcontractor subject to any chattel mortgage, conditional sale contract, or other agreement by which a security interest is retained by the seller. Upon Substantial
Completion of the Work, good title to all materials and supplies incorporated into the Work shall be conveyed to the State, free and clear of all liens and encumbrances.

D. General Prime Contractor's obligation for inspection and quality control shall be as provided for in Article 15, entitled "QUALITY CONTROL & INSPECTION", of these General Conditions.

E. General Prime Contractor's obligation for scheduling of Work and coordination with other entities performing Work required for the completion of the Project shall be as provided for in Article 13, entitled "SCHEDULING AND COORDINATION OF WORK", of these General Conditions.

F. Any Work necessary to be performed after regular working hours, on Sundays, or Legal Holidays, and for which the General Prime Contractor is responsible, shall be performed without additional expense to the State.

G. The General Prime Contractor shall furnish, erect, maintain, and remove such temporary Works as identified in the General Requirements of the Contract.

H. The General Prime Contractor shall give continuous personal superintendence to the Work and its performance at the site, or shall employ a construction superintendent or foreman, experienced in Work of the character covered by the Contract Documents, who shall have full authority to act for the General Prime Contractor.

I. The presence and observation of the Work by DFD's Project Representative shall not relieve the General Prime Contractor of any obligations.

J. The premises and surrounding area shall be kept reasonably free from accumulation of waste material or rubbish as specified in the General Requirements of the Contract.

K. Unused and discarded materials shall be managed or disposed of as specified in the General Requirements of the Contract.

L. If, in the opinion of DFD, the actions or Work of an employee of the General Prime Contractor or a Subcontractor, including MEP Subcontractor or Non-MEP Subcontractor are judged to be unsatisfactory, careless, incompetent, unskilled, in violation of any environmental or safety standards, or otherwise objectionable, the employee shall be removed from the Project or other corrective action taken upon Notice from DFD.

15. QUALITY CONTROL & INSPECTION

A. The General Prime Contractor shall, except where a provision of the Contract Documents explicitly states to the contrary, have the full, complete, and absolute responsibility and obligation for insuring that the Work performed by the General Prime Contractor and Subcontractors, including MEP Subcontractors, and Non-MEP Subcontractors strictly conforms to the requirements set forth in the Contract Documents. The General Prime Contractor shall maintain an adequate inspection and quality control system and shall perform such inspections as will ensure that the Work performed under this Contract conforms to the requirements of the Contract Documents.

B. At the Pre-Construction Meeting, the General Prime Contractor shall provide DFD a full description of the General Prime Contractor's quality control and inspection system and method of implementation.

C. Prior to the start of significant on-site work by any trade, DFD’s Project Representative, the General Prime Contractor’s Superintendent and the Subcontractor’s foremen, including the MEP Subcontractor foremen and Non-MEP Subcontractors’ foremen, shall conduct a pre-installation conference. The purpose of the meeting is to review and discuss Contract requirements applicable to the work, samples required, level of quality necessary, and find answers to any questions that may arise. Such meeting is in addition to regularly-scheduled progress meetings and will be arranged on-site by DFD’s Project Representative.

D. The General Prime Contractor shall maintain complete inspection records and test data to ensure that quality of the Work is in strict compliance with the terms of the Contract Documents. These records shall be available to DFD's Project Representative at all reasonable times and places. The doctrine of "substantial conformity" to the quality
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requirements of the Contract Documents, shall have no application, unless DFD accepts the Work in accordance with Paragraph 15.F.

E. DFD reserves the right to conduct its own quality assurance verification, and to observe, inspect, and/or conduct tests relative to General Prime Contractor and Subcontractor performance. If, when conducting its own quality assurance program, DFD determines that the Work or a portion thereof does not comply with requirements of the Contract Documents, DFD shall attempt to notify the General Prime Contractor of such deficiencies as soon as practicable. However, DFD's exercise of rights under this provision does not:

1. Relieve the General Prime Contractor of the responsibility for providing adequate inspection and quality control measures or the proper documentation of the occurrence of the events required to be tested or monitored in the performance of the Work required by the Contract Documents; and shall provide no basis for waiver or estoppel claims to be asserted against the State;

2. Relieve the General Prime Contractor of responsibility for damage to or loss of the material before acceptance;

3. Constitute or imply acceptance on the part of DFD;

4. Affect the continuing rights of the State after acceptance of the completed Work, except as specifically stated to the contrary, in the Contract Documents.

F. The presence or absence of DFD's Project Representative does not relieve the General Prime Contractor from any Contract requirement. If the General Prime Contractor desires waiver of any technical or Contract requirement or any other deviation from the strict requirements of the Contract Documents, a specific request for such waiver or deviation must be made to DFD's Project Representative for consideration.

G. The General Prime Contractor shall, without charge, replace or correct Work found not to conform to the Contract Document requirements, unless in the public interest, DFD agrees to accept the non-conforming Work with an appropriate adjustment in the Contract price thereof. Such acceptance of non-conforming Work shall, whether the determination is to be made at the time of final completion or during the performance of Work, be based upon a determination by DFD that the deviation from Contract Document requirements does not adversely affect the integrity of completed Work.

H. When DFD directs the General Prime Contractor to replace or correct rejected Work and the General Prime Contractor fails to take such action within the time period identified by DFD, DFD may:

1. Terminate this Contract for default under Article 29, hereof entitled "DFD'S RIGHT TO TERMINATE CONTRACT"; or

2. Suspend or stop the Work under Article 28, hereof entitled "DFD'S RIGHT TO SUSPEND, STOP, OR COMPLETE WORK".

I. If, before acceptance, DFD decides to examine already completed Work by removing it, or removing other Work to expose it, the General Prime Contractor shall promptly furnish all necessary facilities, labor, and material necessary to accomplish the examination. If the Work is found to be defective or non-conforming in any material respect due to the fault of the General Prime Contractor or Subcontractor, or otherwise fails, in the judgment of DFD, to meet the requirements set forth in Paragraph 15.F., the General Prime Contractor shall be responsible for all costs associated with replacement or repair of the defective Work, including the costs of removing or tearing the Work out and satisfactory reconstruction. However, if the Work is found to meet Contract requirements, DFD shall make an equitable adjustment for the additional services involved in the examination and reconstruction, including, if completion of the Work was thereby delayed, an extension of time.

J. Costs caused by defective construction shall be borne by the General Prime Contractor.

K. Unless otherwise specified in the Contract, DFD shall accept, as reasonably as practicable after completion and inspection, all Work completed under the Contract or that portion of the Work which DFD determines can be accepted separately.
16. SUBMITTALS

A. The General Prime Contractor shall submit at the Pre-Construction Meeting a register listing all known submittals required for the project.

B. When the General Prime Contractor makes a "Submittal" to describe how it will fulfill its responsibility under this Contract by submitting Shop Drawings, Samples, Cuts, Catalogues, Models, Mockups, or other preliminary information, the following provisions shall apply:

1. THE GENERAL PRIME CONTRACTOR NOTES THE CONSPICUOUS NATURE OF THIS ARTICLE and agrees that these provisions are material provisions and are to be enforced, in the event of controversy, in such a manner as to place upon the General Prime Contractor the full, complete, and total responsibility for the submittal's conformance with the requirements of this Contract, and suitability or usability of preliminary submissions by the General Prime Contractor, without regard to any DFD action or failure to act;

2. All Submittals and supporting information shall be delivered to a party designated by DFD, who shall act on any such Submittal within ten (10) working days or notify the General Prime Contractor in writing, of the time required for such action if greater than the aforementioned ten (10) day period. Such designation shall take place at the Project Pre-Construction Meeting. Review of the Submittals for conformance with requirements of the Contract Documents shall be completed by the party responsible to DFD for Project design. A copy of all such submittal and transmittal forms shall also be sent to DFD’s Project Representative;

3. The General Prime Contractor shall make submittals in a timely fashion to assure completion of the entire Project within the allowable time specified in the Contract Documents. The timing of such Submittals shall be subject to the provisions of Paragraphs 13.C. and 13.H.;

4. Each Submittal by the General Prime Contractor shall contain the cover page included in the Specifications. Such cover page shall be signed by a representative of the General Prime Contractor responsible for review of the Submittal to assure compliance with requirements of the Contract Documents.

C. Submittals shall be provided in response to requests for submittals by DFD, or whenever required by the Contract Documents.

D. If the General Prime Contractor submits for approval items which do not strictly comply with the design requirements of Contract Documents, the General Prime Contractor shall provide all engineering or design information necessary for complete evaluation of the Submittal by DFD. If it is determined by the General Prime Contractor or DFD that the services of a professional consultant, engineer or architect are required to provide such information, the General Prime Contractor shall acquire such services at its own expense.

E. If the General Prime Contractor believes that requirements of the Contract Documents are in conflict with the manufacturer's recommended method of installation or application of specified materials, products, or systems, the General Prime Contractor shall indicate such possible conflicts at the time of submittal.

17. EQUALS AND SUBSTITUTIONS

A. It is not the intention of DFD to limit or restrict competition by the use of any "Brand Name", reference to a particular manufacturer, process, technique, catalog number or other identifying information. Such proprietary specifications or use of "Brand Names" are intended to establish a level of quality or the minimum essential requirements to which the General Prime Contractor must conform, unless more explicit restrictions are stated to apply.

B. When the Contract Documents list performance or functional characteristics in connection with Work to be performed, these characteristics are mandatory for reasons of design. Use of any "Equal" or "Substitution" shall be subject to the prior written approval of DFD.

C. Material, equipment, or processes offered for use as an "Equal" or "Substitution" may be proposed by the General Prime Contractor in writing. Such proposals shall guarantee the proposed "Equal" or "Substitution" to be capable of
performing the duties of the originally specified material, equipment, or process. DFD shall respond to any such proposal as soon as practicable, but in no case later than seven (7) working days after receipt of such proposal.

D. It shall be the sole responsibility of the General Prime Contractor to provide all documentation, regardless of type or quantity, to clearly establish the qualifications of items proposed as "Equals" or "Substitutions" under this Article 17. If the value of the "Equal" or "Substitution" is less than the item specified in the Contract Documents, then an equitable reduction of the price of the Contract shall be made.

E. When "Equals" or "Substitutions" are approved by DFD and incorporated into the Project by the General Prime Contractor, all costs incurred to 1) correct deficiencies in items, 2) provide for installation or hookup, or 3) to achieve performance specified in the Contract Documents, will be borne by the General Prime Contractor.

F. Any substitute material or equipment installed by the General Prime Contractor without approval of DFD shall be subject to immediate removal and all costs required to conform to the Contract Documents shall be borne by the General Prime Contractor.

G. The General Prime Contractor shall assume all liability and responsibility for any changes in the Work or additional Work required to accommodate use of proposed and approved "Equals" or "Substitutions." DFD's approval of such "Equals" or "Substitutions" does not relieve the General Prime Contractor from the obligation to pay all additional costs resulting from their inclusion in the Work, even if additional costs or Work become apparent after execution of the change or installation of the "Equal" or "Substitution." The General Prime Contractor's liability shall include payment of any additional costs incurred by the State, made necessary by, or directly connected to, such changes.

18. CHANGES IN THE WORK

A. Except in cases of emergency, no changes in the Work required by the Contract Documents may be made by the General Prime Contractor without having prior approval of DFD.

B. DFD may at any time, without invalidating the Contract and without Notice to Sureties, order changes in the Work by written Change Order or Field Order. Such changes may include additions and/or deletions.

C. Where DFD desires to make changes in the Work through use of written Change Order, the following procedures shall apply:

1. If requested by DFD, the General Prime Contractor shall prepare and submit a detailed proposal, including all cost and time adjustments to which the General Prime Contractor believes it will be entitled if the change proposed is incorporated into the Contract. DFD shall be under no legal obligation to issue a Change Order for such proposal;

2. The parties shall attempt in good faith to reach agreement on the adjustments needed to the Contract to properly incorporate the proposed change(s) into the Work. In the event that the parties agree on such adjustments, DFD may issue a Change Order and incorporate such changes and agreed to adjustments, if any;

3. In some instances, it may be necessary for DFD to authorize Work or direct changes in Work for which no final and binding agreement has been reached and for which unit prices are not applicable. In such cases the following shall apply:

a. Upon written request by DFD, the General Prime Contractor shall perform the proposed Work;

b. The cost of such changes shall be determined in accordance with subparagraph 18.1.3.1.

c. In the event agreement cannot be accomplished as contemplated herein, DFD may authorize the Work to be performed by State forces or to hire others to complete the Work. Such action on the part of the State shall not be the basis of a claim by the General Prime Contractor for failure to allow it to perform the changed Work.
D. Where changes in the Work are made by DFD through use of a Field Order, the General Prime Contractor shall as soon as practicable, and in no case later than ten (10) working days from the receipt of such order, unless another time period has been agreed to by both parties, give DFD written Notice, stating:

1. The date, circumstances and source of the Field Order; and,
2. The cost of performing Work described by such Order, if any; and,
3. Effect of the order on the required completion date of the Project, if any.

E. The giving of each Notice by the General Prime Contractor as prescribed by this Article 18, shall be a CONDITION PRECEDENT to liability of the State for payment of any additional costs incurred by the General Prime Contractor in implementing changes in the Work. Under this Article 18, no order or statement of the State shall be treated as a Change Order, or shall entitle the General Prime Contractor to an equitable adjustment of the terms of this Contract or damages for costs incurred by the General Prime Contractor on any activity for which the Notice was not given.

F. In the event Work is required due to an emergency as described in Article 7.B., the General Prime Contractor must request an equitable adjustment as soon as practicable, and in no case later than ten (10) working days of the commencement of such emergency.

G. All General Prime Contractor requests for equitable adjustment shall be submitted to DFD's Project Representative in written form. Such requests shall set forth with specificity the amount of and reason(s) for the proposed adjustment and shall be accompanied by supporting information and documents. The review, resolution, and payment of such requests shall be governed by Article 30.

H. No adjustment of any kind shall be made to this Contract, if asserted by the General Prime Contractor for the first time, after the date of final payment.

I. When DFD makes changes in the Work through written Change Order or Field Order, an amount to be added to or deducted from the Contract shall, at the sole discretion of DFD, be calculated using one of the following methods:

1. By unit prices stated in the Contract Documents or subsequently agreed upon by DFD and the General Prime Contractor; or
2. By a lump sum agreed upon by the General Prime Contractor and DFD, which includes and is limited to the following:
   a. LABOR: Actual labor rate includes the base rate, taxes, insurance and fringe benefits required by agreement or custom. Unit labor is the labor time anticipated to be expended to install the corresponding unit of actual materials, as taken from the appropriate column of a DFD pre-approved current national manual of labor units. Labor cost is the labor hours approved by DFD multiplied by the DFD pre-approved composite hourly labor rates;
   b. MATERIAL: Actual material cost is the amount paid or to be paid by the General Prime Contractor for materials, supplies and equipment entering permanently into the Work, including cost of transportation and applicable taxes. This cost shall be substantiated by the Vendor/Supplier's verified invoices/quotes or by using a DFD approved current national pricing service, lowest column price, multiplied by 0.75. The cost shall not exceed the usual and customary cost for such items available in the geographical area of the project. DFD shall have the option of using either or both methods of substantiation to determine the cost to be used;
   c. LARGE TOOLS AND MAJOR EQUIPMENT: Large tools and major equipment are those with an initial cost greater than $1,000, whether from the General Prime Contractor or other sources. Allowable rental rate is the lesser of the General Prime Contractor’s actual rental schedule pre-approved by DFD or a DFD-approved nationally accepted manual of equipment rental rates, lowest column price, multiplied by 0.75. The rental rate shall not exceed the usual and customary amount for such items available in the geographical area of the project. Tool and equipment use time allowed is only for the
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(extra Change Order work. Rental cost is the above tool and equipment time approved by DFD multiplied by the DFD pre-approved rental rates also described above. When large tools and equipment needed for Change Order work are not already at the job site, the actual labor cost to get them there is also reimbursable;

d. BOND COST: The cost is the actual rate paid for the performance and payment bonds;

e. SUBCONTRACTOR COSTS: Subcontractor costs (including MEP Subcontractor and Non-MEP Subcontractor costs) are for those subcontracted specialties required to complete the Change Order work, with maximum markups as outlined hereinafter;

f. OVERHEAD AND PROFIT ALLOWANCE: The maximum allowable markup for overhead and profit markup on Change Order proposals shall not exceed 15 percent total. The General Prime Contractor markup of change order work done by Subcontractors shall not exceed 7 ½ percent. When the value of a Change Order proposal exceeds $30,000, a declining scale will be used to negotiate the allowable combined overhead and profit margin. Where Change Order proposals involve a credit only, a reasonable allowance for overhead and profit are properly included as part of the downward adjustment for a deductive change exceeding $15,000. The amount of such allowance is subject to negotiation.

g. EXCLUSIONS: All other Change Order expenses are part of the overhead and profit allowance which are not reimbursable as separate items and include the following:

(1) CHANGE ORDER PREPARATION: All costs associated with the processing of the Change Order are included in the overhead and profit allowance;

(2) DESIGN, ESTIMATING, AND SUPERVISION: All such efforts, unless specifically requested by DFD as additional Work to be documented as a Change Order proposal or portion thereof, is included in the overhead and profit allowance;

(3) INSTALLATION LAYOUT: The layout required for the installation of material and equipment, and installation design, is the responsibility of the General Prime Contractor and is included in the overhead and profit allowance;

(4) SMALL TOOLS AND SUPPLIES: The cost of small hand tools with an initial cost of $1,000 or less, along with consumable supplies and expendable items such as drill bits, saw blades, gasoline, lubricating or cutting oil, and similar items, is included in the overhead and profit allowance;

(5) GENERAL EXPENSE: The general expense, which is those items that are a specific job cost not associated with direct labor and material, is included in the overhead and profit allowance;

(6) RECORD DRAWINGS: The preparation of record or as-built drawings required is included in the overhead and profit allowance;

(7) OTHER COSTS: a) All association dues, assessments, and similar items are included in the overhead and profit allowance. b) All education, training, and similar items are included in the overhead and profit allowance. c) All drafting and/or engineering, unless specifically requested by DFD as additional Work to be documented as a Change Order proposal or portion thereof, is included in the overhead and profit allowance. d) All other cost items such as, but not necessarily limited to, review, coordination, estimating, and expediting, relative to Change Order proposals, are associated with field and office supervision and are included in the overhead and profit allowance.

3. By segregating the cost for Work performed and monitoring such costs. These costs shall be recorded daily, reported as a part of the General Prime Contractor's daily report procedure, and certified by DFD's Project Representative. Such costs shall be limited to those identified in subparagraph 18.1.2., except that actual rather than estimated labor expended and material installed shall be used in determining the cost adjustment.

J. The General Prime Contractor shall provide DFD with costs for all proposed Change Orders as outlined in the “Procedures for the Change Order Proposal” document, to be provided by DFD to the General Prime Contractor at the Pre-construction meeting. Typical labor rates to be used shall be provided by the General Prime Contractor to DFD no later than submittal of the first payment request.

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K. The completion date is determined by DFD. The schedule, however, is the responsibility of the General Prime Contractor. Time extensions for extra Work will be considered when a schedule analysis shows that the Change Order places the Work beyond the completion date stated in the Notice To Proceed. Unless the cumulative time extensions for extra Work places the Work beyond the original completion time specified in the Instructions To Bidders, all extended overhead costs are included in the overhead and profit allowance. If significant scope changes occur which places the extra Work beyond the original completion time specified in the Instructions To Bidders, actual additional costs will be considered in accordance with Article 30, CLAIMS.

19. REPORTS, RECORDS AND DATA

A. The General Prime Contractor shall submit to DFD's Project Representative daily Work activity reports for each day on which Work is performed by any employee or entity for which the General Prime Contractor is responsible. Such reports shall include all relevant data concerning the progress of Work activities the General Prime Contractor and Subcontractors are responsible for and the effect of that activity on the time of performance of the Contract or the cost thereof.

B. Daily Work activity reports shall be completed and signed by the General Prime Contractor's Job Superintendent or other on-site representative authorized by the General Prime Contractor to make such reports, who shall be personally responsible for assuring that each such report is current, accurate and complete. The signature of the General Prime Contractor's representative shall constitute a warranty to DFD that, after suitable inquiry, to the best of their knowledge and belief, all such data is current, accurate and complete as of the date of the report.

C. The General Prime Contractor shall submit to DFD's Project Representative schedules of quantities and costs, progress schedules, wage rates, reports, estimates, invoices, records and other data as DFD may request concerning Work performed or to be performed under this Contract if DFD determines such information is needed to substantiate Change Order proposals, claims, or to resolve disputes.

20. NOTICE REQUIREMENTS

A. Except as otherwise expressly provided in the Contract Documents, all notices, demands and other communications that are required to be made or delivered to DFD shall be signed by or on behalf of the General Prime Contractor, and shall be deemed fully made and effective immediately upon presentation to DFD's Project Representative or the deposit thereof in the United States mail, postage prepaid and addressed to DFD's Project Representative.

B. The General Prime Contractor's presentation to DFD's Project Representative or mailing of such Notice to DFD’s Project Representative is a CONDITION PRECEDENT to any liability of DFD for any actual or alleged breach of DFD's contractual obligations hereunder. The General Prime Contractor's failure to give such written Notice in the manner and time prescribed by the Contract Documents shall result in the waiver of any and all claims, demands and causes of action that the General Prime Contractor may have against DFD arising from or in connection with the actual or alleged breach.

21. TIME FOR COMPLETION OF THE PROJECT

A. It is hereby understood and mutually agreed, by and between the General Prime Contractor and DFD that the time for completion of the Work required by the Contract Documents is an ESSENTIAL CONDITION of this Contract.

B. The General Prime Contractor agrees that the Work required by the Contract Documents will be prosecuted regularly and diligently at a rate of progress that will ensure its full completion within the time specified in the Contract Documents. It is expressly understood and agreed, by and between the General Prime Contractor and DFD, that the specified time period for completion of the Work described in the Contract Documents is a reasonable time for the completion of the Work, taking into consideration the average weather conditions and usual industrial conditions prevailing in the locality in which the Work is to be completed.

C. When events occur which, in the opinion of the General Prime Contractor, prevent completion of the Project within the time period allowed by the Contract Documents, the General Prime Contractor shall request an extension of the specified time for completion. Such request shall include the reasons for delay, the amount of time extension being
requested, and any cost(s) associated with the delay. All such requests shall be made in writing and delivered to DFD's Project Representative within ten (10) working days from the beginning of such delay, or within ten (10) working days from the time when the circumstance with potential for delay becomes reasonably known to the General Prime Contractor, whichever is earlier. DFD shall act on such requests as soon as practicable and notify the General Prime Contractor of DFD's decision.

D. If any activity is delayed, or anticipated to be delayed, thereby delaying the completion of the entire Project, the General Prime Contractor shall have the right to take action as may be necessary to recapture any delay. Such action shall include, but not be limited to:

1. Increase in staffing
2. Increase in shifts, hours of Work, or number of days of Work
3. Use of available float
4. Changing the sequence of Work activities

E. Costs caused by delays or improperly timed activities shall be borne by the party responsible therefor, and Change Orders, as deemed appropriate by DFD, shall be issued in accordance with Article 18 of these General Conditions.

F. Costs for acceleration of Work activities to allow completion of the Project in less time than that allowed by the Contract Documents shall be borne by the party requesting such acceleration or early completion. No claim for delay shall be valid against DFD for compensation for delayed completion which extends completion beyond the early finish date, but which does not continue beyond the stated time for completion as set forth in the Contract.

G. Where abnormal weather conditions may have substantially contributed to the delay of Project completion, such determination shall only be made by DFD upon written request by the General Prime Contractor, and by comparing the total season in which such weather occurs with the average of the previous five years. Where DFD determines that weather has substantially delayed Work, thereby delaying completion of the Project within the time specified in the Contract Documents, DFD shall extend the allowable time for completion an amount equal, in the opinion of DFD, to the delay caused by such weather conditions. Extension(s) in the allowable time for completion, when granted by DFD as a result of abnormal weather conditions, shall not be cause for any request for additional compensation by the General Prime Contractor.

H. Where, under the Contract, DFD extends the amount of time specified for completion of the Project, the new time limit fixed by such extension shall be the essence of this Contract.

I. Time extensions and associated adjustments in the Contract Documents which are implemented by, or based on Change Orders and Field Orders for which an overhead allowance would otherwise be permitted hereunder, shall not include any allowance for extended and unabsorbed overhead costs.

J. Permitting the Work or any part of it to continue after the time fixed for its completion, or after the date to which the time for completion may have been extended, shall in no way operate as a waiver on the part of DFD, of any of DFD's rights under the Contract or a waiver of any default by the General Prime Contractor.

K. If the General Prime Contractor fails to complete the Work within the time specified in the Contract and such failure is due to reasons which were not beyond the reasonable control of the General Prime Contractor or if the General Prime Contractor fails to complete the Work within the time specified in the Contract and fails to make the written request as provided for in Paragraph 21(C), then in any such event the General Prime Contractor shall pay to DFD actual damages. When such damages can be reasonably predetermined, the amount will be indicated in the Supplementary General Conditions.

L. If DFD terminates the Contract, or suspends or stops Work in accordance with Paragraphs 28.B. or 29.A. due to the fault of the General Prime Contractor, the damages described in Paragraph 22.M shall be assessed for each day (or any part thereof) such Work is stopped on the Project. If DFD does not elect to terminate the Contract or to suspend or stop the Work, the damages shall be assessed for each day of delay in Substantial Completion.
M. Nothing contained herein shall be construed as limiting the right of the State to recover actual damages sustained as a result of any delay by the General Prime Contractor which exceed the amounts specified in the Supplementary General Conditions.

N. DFD may, at its discretion, waive damages due to the State, or any portion thereof.

22. USE AND POSSESSION PRIOR TO COMPLETION

A. DFD shall have the right to authorize possession or use of any completed or partially completed part of the Work. Before the State takes possession or uses any part of the Project:

1. DFD and the General Prime Contractor shall prepare a list of items of Work remaining to be performed or corrected on those portions of the Project that the State intends to take possession of or use;

2. Failure to include on this list any item of Work clearly required to be performed by the General Prime Contractor shall not relieve the General Prime Contractor of responsibility for complying with the terms of the Contract;

3. The State's possession or use shall not be deemed an acceptance of any Work under the Contract Documents.

B. While the State has such possession or use, the General Prime Contractor shall be relieved of the responsibility for loss or damage to the Work resulting from the State's possession or use.

23. SUBSTANTIAL COMPLETION

A. Prior to the General Prime Contractor’s request for final inspection by DFD, the General Prime Contractor shall conduct an inspection to determine if building systems are functional, Work activities complete, and the Work product is in strict accordance with the requirements of the Contract Documents. If, in the course of this inspection, items are identified which are in need of repair, replacement, correction, or completion, the General Prime Contractor shall make every attempt to complete or correct those items prior to any request for DFD inspection of the Work or Certification of Substantial Completion.

B. When the General Prime Contractor considers that the Work, or a designated portion thereof, is Substantially Complete, the General Prime Contractor shall provide written Notice and Request for Inspection to DFD. Such Notice shall include a list of all known incomplete and non-conforming work along with a schedule for completing each item as appropriate. Upon the receipt of the General Prime Contractor's Notice, DFD will make an inspection to determine whether the Work or designated portion thereof is Substantially Complete. If, during such inspection, DFD identifies items not complete, in need of correction, replacement, or otherwise not in accordance with the requirements of the Contract Documents, the General Prime Contractor shall complete or correct such items. After completion of such punch list items, the General Prime Contractor may request subsequent inspection by DFD.

C. When in the judgment of DFD the Work, or designated portion thereof is Substantially Complete, DFD will prepare a Certificate of Substantial Completion, establishing the responsibilities of the State and General Prime Contractor for security, maintenance, heat, utilities, damage to the Work, and insurance.

D. Where items have been identified which are not complete or are in need of correction DFD may, at its sole discretion declare the Work, or designated portion thereof Substantially Complete, noting such deficiencies. In such case, the Certificate of Substantial Completion shall fix the time within which the General Prime Contractor shall finish all items not completed or corrected.

E. At the time DFD declares the Work or designated portion thereof Substantially Complete, the General Prime Contractor may request payment, reflecting adjustment in retainage, if any, for such Work or portion thereof as provided in the Contract Documents.
24. FINAL COMPLETION AND FINAL PAYMENT

A. Prior to Request for Final Payment, the General Prime Contractor shall provide a Certification that all debts and claims against this Project have either been paid in full or otherwise satisfied and give final evidence of release of all liens against the Project, the State, and all proceeds payable hereunder. The General Prime Contractor shall certify upon such payment request that the data contained therein is current, accurate, and complete. General Prime Contractor shall permit, if requested by DFD, the final inspection to be jointly conducted by the General Prime Contractor and DFD's Project Representative. The General Prime Contractor shall give Notice at least 72 hours in advance of the time set for final inspection.

B. Upon completion of the project and before receiving final payment for work on the project, the General Prime Contractor shall file with DFD an affidavit stating that the General Prime Contractor has complied fully with Section 103.49(4r) Wis. Stat. and that the General Prime Contractor has received an affidavit from each of the General Prime Contractor's agents, MEP Subcontractors, and Non-MEP Subcontractors stating that they also have complied fully with Wis. Stat. § 103.49(4r).

C. As a CONDITION PRECEDENT to Final Payment, all corrective action to remedy deficiencies in the Work required by Contract Documents and Work identified on the punch list must have been completed. In addition, where required by Contract Documents, all training of the user agency's staff in the proper operation and maintenance of the Work shall have been completed, Operating and Maintenance Manuals and Instructions as well as drawings marked up to reflect "as built" conditions must have been transmitted to DFD's Project Representative, and all Warranty certificates signed and presented for DFD acceptance.

D. When to the satisfaction of DFD the Work has been completed, and is of the quality required by the Contract Documents, DFD may authorize payment of all sums then due the General Prime Contractor. Receipt of the final payment, as provided for herein shall constitute a waiver of any and all claims against the State arising out of, under, or incident to the Work performed under the Contract.

E. If the General Prime Contractor fails to submit a Request for Final Payment or make satisfactory arrangements with DFD within thirty (30) calendar days of notification, no further payments will be made and the Contract will be closed. The last Request for Certification for Payment will be considered the Final Payment under the terms and conditions of the Contract.

F. The authorizing of Final Payment by DFD shall constitute the final acceptance of the Work but shall not constitute a waiver of any claims by DFD including, but not limited to the following:

1. Outstanding lien claims or claims for liens;
2. Defective Work which was specifically identified before the making of final payment;
3. Defects which result from the General Prime Contractor's failure to perform the Work in strict accordance with the Contract Documents;
4. Any warranty or guarantee required by the Contract Documents;
5. Any other right surviving the State as to which the General Prime Contractor was specifically given notice before or during the final inspection and final payment process;
6. Rights surviving to the State as a matter of law.

25. WARRANTIES

A. The General Prime Contractor Warrants to DFD that all materials and supplies used in the Work are free from all liens, claims, or encumbrances, and good title to materials and supplies is retained by the General Prime Contractor and shall be conveyed to DFD on or before the date of Substantial Completion.
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B. The General Prime Contractor Warrants to DFD that all materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will strictly conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective.

C. Printed, signed copies of Manufacturer's warranties, which are required by the Contract Documents, shall be presented to DFD prior to approval of final payment.

D. All warranties, including manufacturer's warranties and General Prime Contractor warranties, shall take effect on the date of Substantial Completion and shall remain in effect for a period of one (1) year thereafter, unless Contract Documents specifically require a different warranty period.

E. If any part of the Work is declared Substantially Complete by DFD, and the user agency takes possession of that portion of the Work before completion of the entire Project, the warranty for that portion of the Work shall continue for a period of one (1) year from the date of Substantial Completion for that portion of the Work, unless Contract Documents specifically require a different warranty period.

F. The General Prime Contractor shall remedy, at the General Prime Contractor's expense, any defect in the Work. In addition, the General Prime Contractor shall remedy, at the General Prime Contractor's expense, any damage to State owned or controlled real or personal property, when the damage is the result of:
   1. The General Prime Contractor's failure to conform to Contract Document requirements; or
   2. Any defect in equipment, material, Workmanship, or design furnished by the General Prime Contractor or Subcontractors regardless of tier.

G. The General Prime Contractor shall warrant any Work restored or replaced due to damage caused in fulfilling the terms and conditions of this Article 25, or during performance of any Work required by the Contract Documents. The General Prime Contractor's warranty with respect to Work repaired or replaced will run for one (1) year from the date of Substantial Completion of said repair or replacement.

H. DFD shall notify the General Prime Contractor, in writing, within a reasonable time after discovery of any failure, defect, or damage.

I. If, after the receipt of Notice of a claim under this warranty, the General Prime Contractor fails to remedy any failure, defect, or damage within a time judged reasonable by DFD, DFD shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage, at the General Prime Contractor's expense.

J. All warranties under this Contract or in any related to this contract, express or implied, shall be obtained for and shall be subject to direct enforcement by DFD. The General Prime Contractor shall provide in each subcontract, or other purchase agreement, for the assignment to DFD of all such warranties and for the right of enforcement by DFD. In addition, if necessary the General Prime Contractor shall:
   1. Obtain for the State's benefit all warranties that would be given in normal commercial practice;
   2. Require all warranties to be executed, in writing, for the benefit of the State, if so directed by DFD;
   3. Enforce all warranties for the benefit of the State, if directed to do so by DFD;
   4. Obtain for the State's benefit all warranties given by any Subcontractor, at any tier, if such warranty is in excess of the one (1) year warranty period set forth herein.

K. Unless a defect is caused by the negligence of the General Prime Contractor or Subcontractors at any tier, the General Prime Contractor shall not be liable for the repair of any defects of material or design furnished by the State.

L. This warranty shall not limit the State's rights under Articles entitled:
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(REV 11/2016)

1. Article 15 - "QUALITY CONTROL & INSPECTION"

2. Article 26 - "PAYMENTS TO GENERAL PRIME CONTRACTOR"

3. Article 27 - "PAYMENTS BY GENERAL PRIME CONTRACTOR"

M. Defects in design or manufacture of equipment specified by DFD on a "Brand Name" basis shall not be included in this warranty. In this event, the General Prime Contractor shall require any Subcontractor manufacturers, or suppliers to execute their warranties, in writing, directly to DFD.

26. PAYMENTS TO GENERAL PRIME CONTRACTOR

A. Payments to the General Prime Contractor under the Contract Documents will be made as provided for in Wis. Stat. § 16.855(19)(a), as the Work progresses on this Project. Payment requests will be processed monthly, except for special circumstances approved by DFD. The General Prime Contractor must perform all of the conditions required for payment and must have met the obligations which are necessary to qualify for any partial payments.

1. No General Prime Contractor whose Work is deficient or whose Work fails to conform to the quality standards set forth in the Contract Documents shall be entitled to interim, progress or partial payments;

2. As a CONDITION PRECEDENT to entitlement to payment, the General Prime Contractor shall, at the request of DFD, submit satisfactory evidence to establish that the sum set forth in any application for payment represents the "Proportionate Value" of Work completed;

3. The General Prime Contractor shall certify each request for payment as being a true, accurate, and complete statement of account as of the date on which the certificate was made, and that the stated sums are then earned and payable to the General Prime Contractor;

4. The General Prime Contractor shall certify that it holds clear title to all property of every description which serves as the basis for the application for payment. General Prime Contractor warrants that title to any such property is being transferred to the State free and clear of all liens. If requested by DFD, the General Prime Contractor shall produce satisfactory evidence of transfer of title from suppliers and Subcontractors, including MEP Subcontractors or Non-MEP Subcontractors, to the General Prime Contractor, without reservation, or with adequate waiver of lien. These payments may include any fabricated or manufactured materials and components specified, previously paid for by General Prime Contractor and delivered to the site, properly stored, and suitable for incorporation into the Work embraced in the Contract;

5. All material and Work, title to which has been transferred to the State as a result of the making of a partial payment, shall become the sole property of the State. Nothing in this Article shall be construed as relieving the General Prime Contractor from the risk of loss or damage to any such property. The General Prime Contractor shall have the sole responsibility for obtaining proper insurance on, as well as the responsibility for the care and protection of materials and Work upon which payments have been made. The General Prime Contractor shall be responsible for the restoration of any damaged Work. Nothing herein shall operate as a waiver of the rights of DFD to require fulfillment of all of the terms of the Contract.

6. As soon as possible after the notice to proceed is received, the General Prime Contractor shall submit to DFD’s Project Representative a cost breakdown of the proposed values for work to be performed, as prescribed by the Contract Documents and in the detail requested by DFD. The cost breakdown items shall reflect actual work progress stages as closely as feasible which, if approved by DFD, will become the basis for construction progress payments.

B. All requests for payment shall be submitted to DFD’s Project Representative. To expedite payment of sums due under the Contract, the General Prime Contractor and DFD's Project Representative shall, where possible, jointly review any such request for payment at the site, inspecting the Work, if necessary to determine the validity of the request or modifications to the request which are necessary to accurately represent the value of Work completed in accordance with the Contract Documents.
C. The General Prime Contractor shall furnish any and all accounting records requested by DFD to validate all or any part of any request for payment. The General Prime Contractor shall maintain these accounting records for a period of three (3) years from the date DFD authorizes final payment.

D. For the purposes of this Article 26, requests for payment may include any fabricated or manufactured materials or components specified, previously paid for by the General Prime Contractor and delivered to the Work site, or properly stored and suitable for incorporation in the Work embraced in the Contract Documents. The General Prime Contractor shall identify the method of storage for such materials and shall complete an "Off-site Storage Agreement" form which is available from DFD. Proper evidence of insurance shall be presented to protect the interest of the State. If payment is intended to be requested for any off-site storage items, such items shall be listed as separate lines in the request and certification for payment, cost breakdown.

E. If separate prices are set forth in the Contract Documents for identifiable items of Work, payment for such prices shall be made at the time of completion of those items of Work. Payment under this Paragraph (E) shall be an interim payment until the time of Final Payment and acceptance of the Work by DFD.

F. As the work progresses under the general prime contract for construction of a project the department, from time to time, shall grant to the General Prime Contractor an estimate of the amount and proportionate value of the work properly completed, which shall entitle the contractor to receive the amount, less the retainage, from the proper fund. The retainage shall be an amount equal to not more than 5% of the estimate until 50% of the work has been completed. At 50% completion, no additional amounts shall be retained, and partial payments shall be made in full to the contractor unless the department certifies that the job is not proceeding satisfactorily. At 50% completion or any time thereafter when the progress of the work is not satisfactory, additional amounts may be retained but in no event shall the total retainage be more than 10% of the value of the work completed. Upon substantial completion of the work, any amount retained shall be paid to the General Prime Contractor, less the value of any required corrective work or uncompleted work. For the purposes of this section, estimates may include any fabricated or manufactured materials and components specified, previously paid for by General Prime Contractor and delivered to the work or properly stored and suitable for incorporation in the work embraced in the contract.

Nothing herein shall preclude DFD from deducting from any request for payment such amounts as will properly represent the value of Work which fails to meet the quality standards of the Contract Documents or which the General Prime Contractor fails to complete.

G. In the event DFD receives Notice from any person, Subcontractor, or other third party, that the Contractor has failed to pay such person(s) for Work performed in accordance with the Contract Documents, the Contractor shall, at the request of DFD, and in no more than 10 calendar days, provide all documentation DFD believes necessary to determine whether such payment is due, or reasons for non-payment of disputed amounts. In the event DFD determines the claim to be valid and payment is due, or in the absence of aforementioned documentation, DFD may authorize direct payment of any unpaid bills, withholding from the General Prime Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such claims until satisfactory documentation is furnished that all liabilities have been fully discharged or reasons for non-payment of disputed amounts are provided by the General Prime Contractor. In no event shall these provisions be construed to impose any obligations upon the State to either the General Prime Contractor or the General Prime Contractor's Surety.

H. In paying any unpaid bills of the General Prime Contractor relating to the Work, the State shall be deemed the agent of the General Prime Contractor, and any payment so made by the State shall be considered as a payment made under the Contract by the State to the General Prime Contractor for its account and the State shall not be liable to the General Prime Contractor for any such payment made in good faith.

I. The General Prime Contractor agrees to indemnify and hold the State harmless from all claims growing out of lawful demands of Subcontractors (including MEP Subcontractors and Non-MEP Subcontractors), laborers, Workers, mechanics, material persons, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the performance the Work required by Contract Documents.

J. The General Prime Contractor shall, at DFD's request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived.
27. PAYMENTS BY GENERAL PRIME CONTRACTOR

A. Please see Article 12 for specific information regarding Prompt Payment from General Prime Contractors to MEP Subcontractors and the specific Prompt Payment clause that must be inserted into the contract between General Prime Contractors and MEP Subcontractors.

B. Not more than seven (7) calendar days following the receipt of each Payment authorized by DFD, the General Prime Contractor shall make payment to each and every person, Subcontractors, (including MEP Subcontractors, and Non-MEP Subcontractors), or entity who furnished goods or services for the progress of the Work on the Project, the value of which goods or services were included in the General Prime Contractor's "Request and Certification for Payment" under Article 26 of the General Conditions, or who by law or Contract payment is due upon the receipt of the payment most recently received from the State. The General Prime Contractor shall insert a provision in all subcontracts requiring payment in the manner herein specified. The General Prime Contractor shall also require Subcontractors to include a like provision in all contracts with their subcontractors or suppliers, regardless of tier.

C. Upon request of DFD, satisfactory evidence of payment under this Article 27 shall be furnished to DFD forthwith.

D. Please see Article 12 for specific information regarding retainage on contracts between General Prime Contractors and MEP Subcontractors. In short, retainage on an MEP Subcontract shall occur and be in amounts and on a schedule equal to the retainage schedule in the contract between the General Prime contractor and the State.

E. Nothing herein shall preclude the General Prime Contractor from deducting from any request for payment such amounts as will properly represent the value of Work which fails to meet the quality standards of the Contract Documents or which the MEP Subcontractor fails to complete.

28. DFD'S RIGHT TO SUSPEND, CORRECT, OR COMPLETE WORK

A. DFD may order the General Prime Contractor, in writing, to suspend or delay all or any part of the Work of the General Prime Contractor for the period of time that DFD determines appropriate for the convenience of the State.

1. If the General Prime Contractor determines that the cost of the Work is altered by such suspension, or the time for completion of such Work is altered or delayed, the General Prime Contractor shall provide Notice to DFD of any such costs or delay;

2. Such Notice shall be made within ten (10) calendar days of the order to stop or suspend Work;

3. Provision of such Notice to DFD shall be a CONDITION PRECEDENT to any State liability for increased costs, delay, or time extension.

B. In the event that any of the Work in progress, or Work already completed by the General Prime Contractor, Subcontractors, including MEP Subcontractors, or Non-MEP Subcontractors, is determined by DFD to be of substandard quality, defective, or otherwise in violation of requirements of the Contract Documents, or in the event that the General Prime Contractor fails or refuses to complete Work required by the Contract Documents, DFD may serve written Notice upon the General Prime Contractor requiring that corrective action be taken by the General Prime Contractor to remedy, correct, complete, or replace such Work.

1. The General Prime Contractor shall have ten (10) calendar days after the serving of such Notice within which to take corrective action or to make arrangements judged satisfactory by DFD for the corrections to be made. The Contract shall terminate in accordance with the provisions of Paragraph 29.A. of the General Conditions if corrective action is not taken or other arrangements, judged satisfactory by DFD, are not made by the General Prime Contractor;

2. If the General Prime Contractor fails within the ten (10) calendar day period after receipt of written Notice to commence and continue correction of such default or neglect with diligence and promptness, DFD may order the General Prime Contractor to stop the Work or any portion thereof until the cause for such order has been
GENERAL CONDITIONS OF THE GENERAL PRIME CONTRACTOR CONTRACT

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eliminated. DFD may then, without prejudice to other remedies DFD may have, correct such deficiencies through whatever means necessary;

3. The cost of any corrective action, replacement, or repair shall be chargeable to the General Prime Contractor and its Surety. In such cases DFD may deduct from payments then or thereafter due the General Prime Contractor the cost of correcting such deficiencies, compensation for the State’s additional services, and expenses made necessary by such default, neglect, or failure. Such action by the State shall not prevent the State from recovery of other damages or penalties sustained as a result of the General Prime Contractor's default or neglect. If payments then or thereafter due the General Prime Contractor are not sufficient to cover such amounts, the General Prime Contractor and its Surety shall pay the difference to the State;

4. If, after suspension of the Work, it is determined that the General Prime Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of the State under Paragraph 29.B.

C. The right of DFD to stop or suspend the Work shall not give rise to a duty on the part of DFD to exercise this right for the benefit of the General Prime Contractor or any other person or entity.

D. DFD may exercise any and all rights or remedies provided for herein, by law or in equity, either concurrently or singly in its sole discretion.

29. DFD’S RIGHT TO TERMINATE CONTRACT

A. In the event that any of the provisions of this Contract, including time for completion, are violated by the General Prime Contractor, DFD may serve written Notice upon the General Prime Contractor and the Surety of its intention to terminate this Contract, including the reasons for such intention to terminate. The General Prime Contractor shall have ten (10) calendar days after the serving of such Notice within which to cease the default or violation, to take corrective action, or to make arrangements judged satisfactory by DFD for the corrections to be made. Contract shall terminate upon expiration of the said ten (10) calendar day period if corrective action is not taken by the General Prime Contractor.

1. In the event of termination of the Contract, DFD shall immediately serve Notice thereof upon the Surety and the General Prime Contractor, and the Surety shall have the right to take over and perform the Contract subject to DFD's approval;

2. The Surety shall take over and perform the Contract without need for further agreement with DFD. All Subcontractors shall be subject to approval of DFD in accordance with Article 11. DFD will not consider a General Prime Contractor or a subsidiary of a General Prime Contractor whose contract was terminated as a qualified, responsible Subcontractor.

3. Within ten (10) calendar days after the serving of such Notice of termination, the Surety shall provide DFD with a comprehensive plan for completion of the Work required by the Contract Documents. Such plan must include performance of the Work within a time period acceptable to DFD. In the absence of such a plan, DFD may take possession of materials, appliances, and facilities as may be on the site of the Work, and complete the Work by whatever means necessary;

4. All costs for completion of the Work and any additional damages sustained by the State thereby shall be at the expense of the General Prime Contractor and its Surety.

B. Notwithstanding any contrary provision of the Contract or these General Conditions, DFD shall also have the right, exercisable by it in its sole discretion, to terminate this Contract at any time without cause following the expiration of thirty (30) calendar days after written Notice to the General Prime Contractor. In such event, the General Prime Contractor shall be paid for all Work performed to the effective date of termination, and any “Reimbursable Expenses" outstanding as of the date of termination. The term "Reimbursable Expenses" shall include the cost of personal property or materials which meet requirements of the Contract Documents and have been purchased by the General Prime Contractor for incorporation into the Work but not yet incorporated therein; lease payments due to an unaffiliated third party lessor for equipment provided to the Project, where the lease term extends beyond the
termination date of this Contract and the General Prime Contractor is unable to terminate said lease; and other costs approved by DFD. Reimbursable Expenses do not include lost profits or payments due to Subcontractors, including MEP Subcontractors or Non-MEP Subcontractors for any period of time subsequent to termination of the Contract. Upon payment of the Reimbursable Expenses, the General Prime Contractor shall deliver to the State any materials or personal property for which said payment has been made.

C. The right of DFD to terminate the Contract shall not give rise to a duty on the part of DFD to exercise this right for the benefit of the General Prime Contractor or any other person or entity.

D. DFD may exercise any and all rights or remedies provided for herein, by law or in equity, either concurrently or singly in its sole discretion.

30. CLAIMS

A. The General Prime Contractor shall be barred from asserting or pursuing any claims, demands, and causes of action against the State unless the General Prime Contractor complies with the following requirements:

1. First, the General Prime Contractor shall present its claim to DFD's Project Representative who shall have twenty one (21) calendar days after presentation of the claim to act thereon or notify the General Prime Contractor in writing of the additional time required for such action if greater than the aforementioned twenty-one (21) day period. Failure by DFD's Project Representative to so act within the aforesaid period of time shall constitute a rejection of the General Prime Contractor's claim;

2. If the General Prime Contractor's claim is rejected by DFD's Project Representative, the General Prime Contractor may appeal it in writing to the Administrator of Division of Facilities Development. Any such appeal shall be made within twenty-one (21) calendar days after it is rejected by DFD's Project Representative. If no such appeal is made, the decision of DFD's Project Representative shall become final and binding and the General Prime Contractor shall waive its right to pursue the claim further;

3. If the General Prime Contractor files a timely appeal of the decision of DFD's Project Representative, the Administrator of the Division of Facilities Development shall act on the General Prime Contractor's claim within fourteen (14) calendar days or notify the General Prime Contractor in writing, of the time required for such action if greater than the aforementioned fourteen (14) day period. Failure by the Administrator of the Division of Facilities Development to so act within the aforesaid period of time shall constitute a rejection of the claim;

4. If the General Prime Contractor's claim is rejected by the Administrator of the Division of Facilities Development, the General Prime Contractor shall, as a CONDITION PRECEDENT to filing suit against the State, comply with the two-step claims resolution procedure set forth in Wis. Stat. §§ 16.007,775.01.

B. Any judicial action relating to the construction, interpretation, or enforcement of the Contract Documents including without limitation, the General Prime Contractor's claims, demands, and causes of action for additional construction costs, delay damages, and other amounts owed hereunder, shall be brought and venued in the Dane County Circuit Court in Madison, Wisconsin. The General Prime Contractor hereby consents to personal jurisdiction in that venue, and waives any defenses that the General Prime Contractor otherwise might have relating thereto.

C. The General Prime Contractor hereby waives its right to a jury trial in connection with any judicial action or proceeding that may arise by and between the State and the General Prime Contractor concerning the construction, interpretation, or enforcement of the Contract Documents including, without limitation, any claims, demands, or causes of action that the General Prime Contractor hereafter may assert against the State for additional construction costs, delay damages, and other amounts.

D. The General Prime Contractor shall proceed diligently with the performance of the Work, as directed by DFD, pending the final decision of DFD's Project Representative, the Administrator of the Division of Facilities Development, the State Claims Board, the Legislature, and any subsequent judicial action or appeal.
GENERAL CONDITIONS OF THE GENERAL PRIME CONTRACTOR CONTRACT

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E. It is recognized by DFD and General Prime Contractor that performance of DFD’s duties may require or cause the interruption or suspension of the Work for periods other than the reasonable time allowed under Article 28. In the event of such interruption or suspension, DFD and the General Prime Contractor shall negotiate in good faith in an effort to agree upon the additional construction costs and other amounts, if any, that shall be paid the General Prime Contractor because of the interruption or suspension of Work. Anything in the Contract Documents to the contrary notwithstanding, however, it is expressly understood and agreed that:

1. The total amount recoverable by and payable to the General Prime Contractor shall be limited to an amount equal to the sum of:
   a. The additional construction costs and other amounts actually incurred by the General Prime Contractor because of DFD's actions and omissions; plus
   b. A maximum overhead and profit allowance equal to fifteen (15) percent of the sum of additional construction costs and other amounts.

2. Overhead costs for extended or unabsorbed overhead shall not be used as the basis for calculating or determining the amount of any additional construction costs or other amounts recoverable by or payable to the General Prime Contractor; and

3. By entering into this Contract with DFD, the General Prime Contractor hereby waives any rights that it otherwise might have to pursue recovery of overhead costs for extended or unabsorbed overhead from DFD.

F. DFD and the General Prime Contractor shall act in good faith to efficiently and fairly resolve claims and disputes arising under the Contract in order to avoid wherever possible, formal legal proceedings.

31. INSURANCE

A. The General Prime Contractor shall not commence Work under this Contract until the General Prime Contractor has obtained all the insurance required under this Paragraph 31.A. Such insurance must be approved by DFD. The company providing the insurance must be lawfully authorized to do business in Wisconsin and/or be approved by DFD with a minimum A.M. Best rating of (A-). The General Prime Contractor shall provide the following insurance:

1. Worker's Compensation Insurance:
   a. The General Prime Contractor shall procure and maintain during the life of this Contract, and shall require all Subcontractors, including MEP Subcontractors and Non-MEP Subcontractors, to maintain, Worker's Compensation Insurance as required by State of Wisconsin Statutes and any applicable Federal Act coverage such as the Longshoremen’s and Harbor Workers Act, the Jones Act or the Admiralty Act for all employees engaged in Work associated with the Project under this Contract. Minimum coverage is listed in paragraph 31.A.5.
   b. The General Prime Contractor shall procure and maintain during the life of this Contract, and shall require all Subcontractors, including MEP Subcontractors and Non-MEP Subcontractors, to maintain, Employer's Liability Insurance. Minimum coverage is listed in paragraph 31.A.5.

2. Commercial General Liability Insurance and Excess Liability-Umbrella:
   a. The General Prime Contractor shall maintain during the life of this Contract, and until two years after completion of this Contract, Commercial General Liability Insurance, including Products and Completed Operations for all claims that might occur in carrying out the Contract. Minimum coverage is listed in paragraph 31.A.5. Such coverage shall be of the "occurrence" type form.
   b. The General Prime Contractor's Commercial General Liability and Umbrella Insurance shall apply to the provisions of indemnity obligations under Section 37 of these General Conditions.
c. Such Commercial General Liability coverage shall include employees of the General Prime Contractor as insureds.

d. The General Prime Contractor shall require Subcontractors to procure and maintain Commercial General Liability Insurance and Excess Liability equal to that required in subparagraph 31.A.2.a. The General Prime Contractor shall require each MEP Subcontractor to procure and maintain Commercial General Liability and Umbrella Insurance equal to that required in subparagraph 31.A.2.a. However, the General Prime Contractor may insure the activities of the Non-MEP Subcontractor(s) in the General Prime Contractor’s policy. The General Prime Contractor’s policy shall include coverage for Independent Contractors.

3. Auto Liability Insurance:

a. The General Prime Contractor shall procure and shall maintain during the life of the Contract Commercial Automobile Liability Insurance for all owned, non-owned, and hired vehicles that are used in carrying out the Contract. Minimum coverage is listed in paragraph 31.A.5.

b. The General Prime Contractor shall require each Subcontractor, including MEP Subcontractors and Non-MEP Subcontractors, to procure and maintain Commercial Auto Liability Insurance equal to that required in paragraph 31.A.3.a of the General Conditions.

4. The minimum required limits do not represent the coverage and limits necessary to protect the General Prime Contractor. The limits should not be construed in any way to limit the General Prime Contractor's liability to the State.

5. Minimum Limits Required:

<table>
<thead>
<tr>
<th>TYPE</th>
<th>Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial General Liability</td>
<td>$1,000,000 General Aggregate (applies per project)</td>
</tr>
<tr>
<td></td>
<td>$1,000,000 Products Aggregate</td>
</tr>
<tr>
<td></td>
<td>$1,000,000 Personal Injury</td>
</tr>
<tr>
<td></td>
<td>$1,000,000 Each Occurrence</td>
</tr>
<tr>
<td></td>
<td>$50,000 Fire Damage</td>
</tr>
<tr>
<td></td>
<td>$5,000 Medical Expense Per Person</td>
</tr>
<tr>
<td>Automobile Liability</td>
<td>$1,000,000 Combined Single Limit</td>
</tr>
<tr>
<td>Excess Liability Umbrella</td>
<td>$5,000,000 Each Occurrence</td>
</tr>
<tr>
<td></td>
<td>$5,000,000 Aggregate</td>
</tr>
</tbody>
</table>

Worker’s Compensation/Employers Liability Insurance

1. State: Statutory to all states the work is being performed;
2. Federal: As Applicable;
3. All Employees, partners, individuals, any managers on project site must be included for coverage.

6. The Commercial General Liability and Umbrella policies described in paragraph 31.A.2. of the General Conditions shall include the State as an Additional Insured as respects the activities carried out under this Contract. Additional coverage on the General Prime Contractor’s Umbrella policy can be used to make up the required limits.

7. Proof of Insurance: The General Prime Contractor shall provide a certificate of insurance to DFD from a company lawfully authorized to do business in the State of Wisconsin indicating coverage is in place at the limits set forth in this Article. The insurer shall give DFD thirty (30) day notice of cancellation or changes in coverage. The insurance certificate shall be provided before commencement of the Contract. If the General Prime Contractor is self-insured, audited financial records will need to be provided that clearly demonstrate the
financial ability to cover losses up to the limits of insurance required. The General Prime Contractor shall also be required to disclose deductibles or Self-Insured Retention’s (SIR).

8. Commercial General Liability and Auto Liability carried under Article 31 shall contain a provision making it primary and non-contributory to any other coverage available to the State.

B. The State shall purchase and maintain, in a company or companies lawfully authorized to do business in the State of Wisconsin, Builder’s Risk insurance in the amount of, at least, the initial Contract sum as well as subsequent modifications thereto for the entire Work at the site on a replacement cost basis.

1. Property Insurance shall include insurance for physical loss or damage to the Work, temporary buildings, and equipment or material consumed in the construction of the Work.

2. Off-Site and Transit Coverage: Upon the request of the General Prime Contractor and written approval of DFD, the Property Insurance policy, subject to policy terms, definitions, and conditions, will provide a $250,000 limit for materials and/or Work stored off the site or in transit. It is the General Prime Contractor's responsibility to insure materials and/or Work in excess of this amount. The State will not be responsible for materials or completed Work under the care, custody, and control of the manufacturer prior to delivery;

3. Deductible: The property insurance shall be written with a deductible sum of no more than $10,000 for each occurrence. If the Contract value is less than $1,000,000 and the loss is attributable to the General Prime Contractor, a Subcontractor, including MEP Subcontractor or Non-MEP Subcontractor, a $5,000 deductible per occurrence will apply. The risk of loss within the deductible amount will be borne by the General Prime Contractor;

4. Loss of Use Insurance: The State, at DFD's option, may maintain such property insurance as will insure the State against loss of use of the State's property due to fire or other hazards, however caused. Except as set forth in section C.2. below, DFD waives all rights of action against the General Prime Contractor for loss of use of the State's property, including consequential losses due to fire or other hazards covered by the Property Insurance described in subparagraph 31.B.1

5. Policy Review: A copy of the property insurance policy or policies may be obtained pursuant to the Public Records and Property Provisions of the Wisconsin State Statutes.

C. 1. The State and General Prime Contractor waive all rights against each other and shall require its insurers to waive any rights of subrogation or recovery, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this Article 31 or other property insurance applicable to the Work. The policies shall provide such waivers of subrogation by endorsement or otherwise, except as set forth in C.2. below. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise; did not pay the insurance premium directly or indirectly; and whether or not the person or entity had an insurable interest in the property damaged. This waiver shall be effective only to the extent any policy of insurance is not impaired thereby. This contract provision shall be incorporated into the contracts between the General Prime Contractor, MEP Subcontractors, and Non-MEP Subcontractors.

2. DFD retains the right to subrogate against General Prime Contractor, Subcontractors including MEP Subcontractor and Non-MEP Subcontractor(s), up to $1,000,000 per occurrence, for damage to property, including loss of use thereof, provided said property damage is to work performed by other parties and provided said General Prime Contractor’s, Subcontractors' including MEP Subcontractors’, and Non-MEP Subcontractors’, negligence contributed in any way to said damage. This contract provision shall be incorporated into the contracts between the General Prime Contractor and Subcontractors, including MEP Subcontractors, and Non-MEP Subcontractors.

32. NONDISCRIMINATION/AFFIRMATIVE ACTION

A. In connection with the performance of Work under this Contract, the General Prime 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 Wis. Stat. §51.01(5), sexual orientation, national origin, or any other basis prohibited by law. 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. Except with respect to sexual orientation, the General Prime Contractor further agrees to take affirmative action to ensure equal employment opportunities. This contract provision shall be incorporated into the contracts between the General Prime Contractor, MEP Subcontractors, and Non-MEP Subcontractors.

B. Contracts with a value of fifty thousand dollars ($50,000) or more require the General Prime Contractor to submit a written affirmative action plan acceptable under Wisconsin Statutes and Administrative Code. An exemption occurs from this requirement if the General Prime Contractor has a workforce of less than fifty (50) employees. The General Prime Contractor is responsible for obtaining affirmative action compliance from MEP Subcontractors and Non-MEP Subcontractors. Instructions on satisfying these requirements will be sent with the Notice to Proceed. Technical assistance regarding this Article 32 is available from the Wisconsin Office of Contract Compliance, telephone (608) 266-5462.

C. The General Prime Contractor should establish and take appropriate initiatives to reach goals and timetables for minority and female utilization which shall be based on appropriate workforce, demographic, or other relevant data which shall cover construction projects or construction contracts performed in specific geographical areas. The goals shall be applicable to the General Prime Contractor’s, MEP Subcontractor’s, or Non-MEP Subcontractor’s entire workforce which is working in the area covered by the goals. The goals are established and are as follows:

<table>
<thead>
<tr>
<th>County</th>
<th>Women Goal</th>
<th>Minority Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams/Juneau/Monroe/Vernon</td>
<td>12%</td>
<td>2%</td>
</tr>
<tr>
<td>Ashland/Bayfield/Douglas/Price</td>
<td>9%</td>
<td>6%</td>
</tr>
<tr>
<td>Barron/Sawyer/Washburn</td>
<td>13%</td>
<td>4%</td>
</tr>
<tr>
<td>Brown</td>
<td>11%</td>
<td>9%</td>
</tr>
<tr>
<td>Buffalo/Jackson/Pepin/Trempealeau</td>
<td>12%</td>
<td>5%</td>
</tr>
<tr>
<td>Burnett/Polk</td>
<td>11%</td>
<td>2%</td>
</tr>
<tr>
<td>Calumet/Winnebago</td>
<td>11%</td>
<td>3%</td>
</tr>
<tr>
<td>Chippewa/Rusk</td>
<td>12%</td>
<td>2%</td>
</tr>
<tr>
<td>Clark/Taylor</td>
<td>16%</td>
<td>2%</td>
</tr>
<tr>
<td>Columbia</td>
<td>12%</td>
<td>2%</td>
</tr>
<tr>
<td>Crawford/Grant/Richland</td>
<td>14%</td>
<td>2%</td>
</tr>
<tr>
<td>Dane</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>Dodge</td>
<td>12%</td>
<td>3%</td>
</tr>
<tr>
<td>Door/Kewaunee/Manitowoc</td>
<td>13%</td>
<td>3%</td>
</tr>
<tr>
<td>Dunn/Eau Claire</td>
<td>11%</td>
<td>3%</td>
</tr>
<tr>
<td>Florence/Forest/Marinette/Oconto</td>
<td>13%</td>
<td>2%</td>
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<tr>
<td>Fond du Lac</td>
<td>11%</td>
<td>4%</td>
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<tr>
<td>Green/Iowa/Lafayette</td>
<td>13%</td>
<td>1%</td>
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<tr>
<td>Green Lake/Marquette/Waushara</td>
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<td>4%</td>
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<tr>
<td>Iron/Oneida/Vilas</td>
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<td>3%</td>
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<tr>
<td>Jefferson</td>
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<tr>
<td>Kenosha</td>
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<td>10%</td>
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<tr>
<td>La Crosse</td>
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<td>4%</td>
</tr>
<tr>
<td>Langlade/Lincoln/Menominee/Shawano</td>
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<td>7%</td>
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<tr>
<td>Marathon</td>
<td>12%</td>
<td>4%</td>
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<tr>
<td>Milwaukee</td>
<td>10%</td>
<td>29%</td>
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<tr>
<td>Outagamie</td>
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<td>5%</td>
</tr>
<tr>
<td>Ozaukee</td>
<td>8%</td>
<td>3%</td>
</tr>
<tr>
<td>Pierce/St Croix</td>
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</tr>
<tr>
<td>Portage</td>
<td>13%</td>
<td>3%</td>
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<tr>
<td>Racine</td>
<td>8%</td>
<td>13%</td>
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</tbody>
</table>
D. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom a General Prime Contractor has a collective bargaining agreement, to refer to either minorities or women shall excuse the General Prime Contractor’s required initiatives under these specifications.

E. The General Prime Contractor agrees to post in conspicuous places, available for employees and applicants for employment, a notice to be provided by the State that sets forth the provisions of this Article 32.

F. Failure to comply with the conditions of this Article 32 may result in the General Prime Contractor becoming declared an "ineligible" General Prime Contractor, termination of the Contract, or withholding of payment.

33. MINIMUM WAGES

A. Wage determinations required by State Law are listed in the Supplementary General Conditions.

B. If, after the award of the Contract, it becomes necessary to employ any person in a trade or occupation not classified in the wage determinations, such person shall be paid at not less than such rate as shall be determined by the Department of Administration. Such approved minimum rate shall be retroactive to the time of the initial employment of such person in such trade or occupation. The General Prime Contractor shall notify DFD of the General Prime Contractor's intention to employ persons in trades or occupations not classified in sufficient time for DFD to provide approved rates for such trades or occupations.

C. The specified wage rates are minimum rates only, and DFD will not consider any claims for additional compensation made by the General Prime Contractor because of payment by the General Prime Contractor of any wage rate in excess of the applicable rate contained in this Contract. Any disputes in regard to the payment of wages in excess of those specified in this Contract shall be adjusted by the General Prime Contractor.

D. Failure to comply with the conditions of this Article 33 may result in Contract termination or withholding of payment.

34. ASSIGNMENTS

A. The General Prime Contractor shall not assign the whole or any part of this Contract or any moneys due or to become due hereunder without the prior written consent of DFD. In case the General Prime Contractor assigns all or any part of any moneys due or to become due under this Contract, the instrument of assignment shall contain an Article substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to the General Prime Contractor shall be subject to prior claims of all persons, firms, and corporations for services rendered or materials supplied for the performance of the Work called for in this Contract and subject to the terms of this Contract and claims of offset by the State.

B. On the date of Substantial Completion, the General Prime Contractor shall assign to the State all warranties and guarantees of labor or material incorporated into the Work which are provided by third party vendors, suppliers, manufacturers, and Subcontractors, including MEP Subcontractors or Non-MEP Subcontractors.
35. ANTITRUST AGREEMENT

The General Prime Contractor and the State recognize that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by the State. Therefore, the General Prime Contractor hereby assigns to the State any and all claims for such overcharges as to goods and materials purchased in connection with this Contract, except as to overcharges which result from antitrust violations commencing after the price is established under this Contract and any Change Order thereto.

36. INDEMNIFICATION

A. To the fullest extent permitted by law, and in addition to any other indemnification provisions provided for herein, the General Prime Contractor shall indemnify and hold harmless the State, the A/E and its agents and employees and 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 (1) attributable to bodily injury, sickness, disease or death, or to injury to or destruction of property, including loss of use resulting therefrom, and (2) is caused in whole or in part by acts or omissions of the General Prime Contractor, a Subcontractor thereof, a MEP Subcontractor, a Non-MEP Subcontractor thereof, anyone directly or indirectly employed by any of 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 which would otherwise exist as to a party or person described in this section.

B. The obligations of the General Prime Contractor under this indemnification shall not extend to the liability of the State, the A/E and its agents or employees thereof arising out of (1) preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by DFD, or the A/E or its agents or employees thereof provided such giving or failure to give is the cause of the injury or damage.

37. GENERAL PRIME CONTRACTOR PERFORMANCE EVALUATION

A. The General Prime Contractor acknowledges that following completion of the Work, DFD's Project Representative will evaluate the General Prime Contractor's performance under and pursuant to this Contract. Such evaluation may take place after Substantial Completion or after Final Completion of the Work, as determined by DFD's Project Representative. The purpose of such evaluation includes, but is not limited to, determining whether or not the General Prime Contractor responsibly performed its Contractual obligations and whether or not the best interests of the State were promoted thereby.

B. DFD shall provide a copy of any such performance evaluation to the General Prime Contractor, as soon as practicable after completion of such evaluation.

C. The General Prime Contractor may appeal results of the General Prime Contractor's performance evaluation completed by DFD's Project Representative by submitting a request for performance review to the Administrator of the Division of Facilities Development. Any such request must include the reasons for such request, and documentation necessary to substantiate the General Prime Contractor's claim that initial performance evaluation was inappropriate or otherwise in error. The Administrator shall notify the General Prime Contractor of the results of this review as soon as practicable.

D. DFD reserves the right to waive the results of such performance evaluation(s) if, in the opinion of DFD, corrective action has been taken to remediate substandard performance, events beyond the control of the General Prime Contractor resulted in substandard performance, or the best interests of the State will be served.

E. The General Prime Contractor acknowledges and agrees that such evaluation(s) may be used by DFD pursuant to Wis. Stat. § 16.855(9m) when determining whether the General Prime Contractor is a "qualified responsible bidder" for future Project(s); provided, however, any such evaluation made more than five (5) years prior to the submission of any such subsequent bid shall not be considered in any event.

F. The General Prime Contractor acknowledges and agrees that all such evaluations so prepared by DFD shall constitute "open public records" available for inspection and copying as provided for by law.

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SUPPLEMENTARY GENERAL CONDITIONS (Rev 11/2017)
Division Project No. 00001

INDEX

1. Definitions
2. Insurance
3. Time For Completion of the Project
4. Schedule of Occupational Classifications and Minimum Hourly Wage Rates (REPEALED)

1. DEFINITIONS
General Conditions, Article 2.B. shall be supplemented with the following:

Architect/Engineer (A/E) for this project: Northlands Design Company, 1415 Engineering Dr., Madison, WI 53706

2. INSURANCE
General Conditions, Article 31.A.(4), shall be supplemented with "special hazard" coverage as follows:

"General Prime Contractor's, MEP Subcontractor's and Subcontractor's Public Liability and Property Damage Insurance shall provide adequate protection against the following special hazards, unless provided as part of Comprehensive General Liability coverage: loading and unloading; excavating; filling; drilling; blasting; explosions; hoist. Coverages shall be in the amounts specified in Article 31 of the General Conditions."

3. SCHEDULE OF OCCUPATIONAL CLASSIFICATIONS AND MINIMUM HOURLY WAGE RATES (REPEALED)
The 2017-2019 Wisconsin State Budget (2017 Wisconsin Act 59) repealed Wisconsin’s prevailing wage laws. Effective September 23, 2017, state prevailing wage requirements on state building projects no longer apply. These changes take effect for projects advertised for bid after September 23, 2017. This change does not affect the Federal Davis Bacon Act requirements.
SUPPLEMENTARY GENERAL CONDITIONS

Division Project No. 00001
Federal Project No. 00001

INDEX

1. Definitions
2. Surveys, Permits, Regulations and Taxes
3. Withholding of Payments
4. Insurance
5. Contract Security
6. Subcontracts
7. Nondiscrimination/Affirmative Action
8. Minimum (Prevailing) Wages – Additional Federal Contracting Requirements
9. Additional General Conditions
10. Time for Completion of the Project
11. Schedule of Occupational Classifications and Minimum Hourly Wage Rates

1. DEFINITIONS

General Conditions, Article 2.B. shall be supplemented with the following:

Architect/Engineer (A/E) for this project: Northlands Design Company, 1415 Engineering Dr., Madison, WI 53706, (608) 921-8790

General Conditions, Article 2. shall be supplemented with the following definition:

CC. Federal Government/Agency: City of Durand, 104 E. Main St., Durand, WI 54736; (715) 672-8770

2. PERMITS, REGULATIONS, UTILITIES AND TAXES

General Conditions, Article 8.C.: Where reference is made to State laws, rules and regulations supplement the phrase with the words, "and Federal".

3. WITHHOLDING OF PAYMENTS

General Conditions, Article 26.F., add a new sentence as follows after the last sentence:

"DFD may withhold from the General Prime Contractor so much of the accrued payments as may be considered necessary to satisfy any liability of any General Prime Contractor or Subcontractor for liquidated damages under Article 38 hereof entitled "Contract Work Hours Standards Act Overtime Compensation (40 USC 3701-3703)"."

4. INSURANCE

General Conditions, Article 31.A.(4) shall be supplemented with "special hazard" coverage as follows:

"General Prime Contractor's, MEP Subcontractor's and Subcontractor's Public Liability and Property Damage Insurance shall provide adequate protection against following special hazards, unless provided as part of Comprehensive General Liability coverage: loading and unloading; excavating; filling; drilling; blasting; explosions; elevator; hoist. Coverages shall be in the amounts specified in Article 31 of the General Conditions."

5. CONTRACT SECURITY

General Conditions, Article 5.B., Add to the second sentence the following words: "and the Federal Government."
6. SUBCONTRACTS

General Conditions, Article 11. shall be supplemented with the following additional articles to be inserted in all subcontracts:

"Articles 38 through 42 inclusive, respectively entitled: Contract Work Hours Standards Act - Overtime Compensation (40USC 3701-3703), Payrolls and Basic Records, Compliance with Copeland Regulations, Contract Termination-Debarment and Certification of Nonsegregated Facilities."

General Conditions, Article 11, add new paragraph "I" as follows:

"I. The General Prime Contractor may utilize the services of only those Subcontractors who have not been disqualified under existing Federal laws and regulations from participating in Federally assisted construction project."

7. NONDISCRIMINATION/AFPIRMATIVE ACTION

General Conditions, Article 32, shall be supplemented and modified as follows:

Supplement Paragraph B with a new subparagraph as follows:

"1) The General Prime Contractor shall send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided, advising the labor union or workers' representative of the Contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment."

Add new paragraphs G through I as follows:

"G. The General Prime Contractor shall comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations and relevant orders of the Secretary of Labor.

H. The General Prime Contractor shall furnish all information and reports required by the referenced documents, rules, regulations and relevant orders stated in Article 33 and shall permit access to its books, records and accounts by appropriate agencies of the State and Federal Governments and by the Secretary of Labor for purposes of investigation to ascertain compliance with such laws, rules, regulations and orders.

I. The General Prime Contractor shall include all of Paragraphs A through F inclusive in every MEP Subcontract, Subcontract or purchase order unless exempted by rules, regulations or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions shall be binding upon each MEP Subcontractor, Subcontractor or vendor. The General Prime Contractor shall take such action with respect to any MEP Subcontractor, Subcontractor or vendor as the appropriate agency of the Federal or State Government may direct as a means of enforcing such provisions, including sanctions for noncompliance: provided, however, that in the event that the General Prime Contractor becomes involved in, or is threatened with, litigation with an MEP Subcontractor, Subcontractor or vendor as a result of such direction by the appropriate agency of the Federal Government, the General Prime Contractor may request the United States to enter into such litigation to protect the interests of the United States."

8. MINIMUM (PREVAILING) WAGES – ADDITIONAL FEDERAL CONTRACTING REQUIREMENTS

General Conditions, Article 33, add new Paragraphs "F through J" as follows:

SGC-2
"F. All mechanics and laborers employed or working directly upon the site of the work shall be paid unconditionally, and not less often than once a week, and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by the Copeland Regulations (29 Code of Federal Regulations, Part 3)], the full amounts due at time of payment computed at wage rates not less than the aggregate of the basic hourly rates and the rates of payments, contributions, or costs for any fringe benefits contained in the wage determination decision of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor of Subcontractor and such laborers and mechanics, and the wage determination decision shall be posted by the General Prime Contractor at the site of the work in a prominent place where it can easily be seen by the workers.

G. The General Prime Contractor may discharge its obligation under paragraph 33. to workers in any classification for which the wage determination decision contains:

1) Only a basic hourly rate of pay, by making payment not less than such basic hourly rate, except as otherwise provided in the Copeland Regulations (29 CFR, Part 3); OR

2) Both a basic hourly rate of pay and fringe benefit payments, by making payment in cash, by irrevocably making contributions pursuant to a fund, plan or program for and/or by assuming an enforceable commitment to bear the cost of bona fide fringe benefits contemplated by the Davis-Bacon Act, or by any combination thereof. These fringe benefit payments can be discharged only by making contributions to the same type or types of fringe benefits listed in the applicable determination. Contributions made, or costs assumed, on other than a weekly basis shall be considered as having been constructively made or assumed during a weekly period to the extent that they apply to such period. Where a fringe benefit is expressed in a wage determination in any manner other than as an hourly rate and the General Prime Contractor pays a cash equivalent or provides an alternative fringe benefit, it shall furnish information with his payrolls showing how it determined that the cost incurred to make the cash payment or to provide the alternative fringe benefit is equal to the cost of the wage determination fringe benefit. In the event of disagreement between or among the interested parties as to an equivalent of any fringe benefit, the State shall submit the question together with its recommendation through the appropriate Federal agency to the Secretary of Labor for final determination.

H. The assumption of an enforceable commitment to bear the cost of fringe benefits listed in the wage determination decision forming a part of the Contract may be considered as payment of wages only with the approval of the Secretary of Labor pursuant to a written request by the General Prime Contractor. The Secretary of Labor may require the General Prime Contractor to set aside assets, in a separate account, to meet its obligations under any unfunded plan or program.

I. The State shall require that any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the General Prime Contractor shall be classified or reclassified conformably to the wage determination and a report of the action taken shall be sent to the appropriate Federal agency. If the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers or mechanics to be used, the State shall submit the question together with its recommendations through the appropriate Federal agency to the Secretary of Labor for final determination.

J. In the event it is found by the State that any laborer or mechanic employed by the General Prime Contractor, MEP Subcontractor or any Subcontractor directly on the site of the work has been or is being paid at a rate of wages less than the rate of wages required by Article 33., the State may (a) by written notice to the General Prime Contractor terminate its right to proceed with the work, or such part of the work as to which there has been a failure to pay said required wages, and (b) prosecute the work to completion by General Prime Contractor or otherwise, whereupon such General Prime Contractor and its sureties shall be liable to the State for any excess costs occasioned thereby."
9. ADDITIONAL GENERAL CONDITIONS

Add new Articles "38 through 42" to the General Conditions as follows:

38. CONTRACT WORK HOURS STANDARDS ACT - OVERTIME COMPENSATION

(40 United States Code 327-330)

A. The General Prime Contractor shall not require or permit any laborer or mechanic in any work-week in which it is employed on any work under this Contract to work in excess of 40 hours in such work-week on work subject to the provisions of the Contractor Work Hours Standards Act unless such laborer or mechanic receives compensation at a rate not less than one and one-half times its basic rate of pay for all such hours worked in excess of 40 hours in such work-week. The "basic rate of pay" as used in this provision shall be the amount paid per hour, exclusive of the General Prime Contractor's contribution or cost for fringe benefits, and any cash payment made in lieu of providing fringe benefits, or the basic hourly rate contained in the wage determination, whichever is greater.

B. In the event of any violation of the provisions of Article 38.A. above, the General Prime Contractor shall be liable to any affected employee for any amounts due. Such liquidated damages shall be computed with respect to each individual laborer or mechanic employed in violation of the provisions of Article 38.A. in the sum of $10 for each calendar day on which such employee was required or permitted to be employed on such work in excess of the standard work-week of 40 hours without payment of the overtime wages required by Article 38.A.

39. PAYROLLS AND BASIC RECORDS

A. The General Prime Contractor shall maintain payrolls and basic records relating thereto during the course of the work and shall preserve them for a period of three (3) years thereafter for all laborers and mechanics working at the site of the work. Such records shall reference the project and contain the name and address of each employee, its correct classification, rate of pay (including rates of contributions for, or costs assumed to provide, fringe benefits), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the General Prime Contractor has obtained approval from the Secretary of Labor as provided in Article 33.F., it shall maintain records which show the commitment, its approval, written communication of the plan or program to the laborers or mechanics affected, and the costs anticipated or incurred under the plan or program.

B. The General Prime Contractor shall obtain and preserve copies of payrolls of all MEP Subcontractors and Subcontractors as required for the General Prime Contractor's own records. Provide a signed statement if directed indicating that the payrolls are correct and complete, that the wage rates contained therein are not less than those determined by the Secretary of Labor, and that the classifications set forth for each laborer or mechanic conform with the work it performed. Retaining of the "Weekly Statement of Compliance" required under this Contract and the Copeland Regulations of the Secretary of Labor (29 CFR, Part 3) shall satisfy the requirement for providing of the above statement. The General Prime Contractor shall also preserve a copy of any approval by the Secretary of Labor with respect to fringe benefits which is required by Article 33.G.

C. The General Prime Contractor shall make the records required under Articles 39.A. and 39.B. available for inspection by authorized representatives of the State Agency, the State, the appropriate Federal agency and the U.S. Department of Labor, and shall permit such representatives to interview employees during working hours on the job.

D. The General Prime Contractor shall certify to the State Agency, the State of Wisconsin, the appropriate Federal agency and the U.S. Department of Labor that the wages paid are in compliance with the wage rate requirements of the contract.

E. The General Prime Contractor shall submit electronic copies of the payroll records (copy of payroll checks) to the State of Wisconsin’s DFD Construction Representative who shall review same for compliance.
with the wage rate requirements of the contract. This shall be done each time the Contractor makes
application for payment. Approval of payment shall be made upon review of compliance.

40. COMPLIANCE WITH COPELAND REGULATIONS
The General Prime Contractor shall comply with the provisions of the Copeland "Anti-kickback Act" (18
U.S.C. 874) as supplemented in Department of Labor regulations (29 CFR, Part 3). This Act provides that
each General Prime Contractor, MEP Subcontractor or Subcontractor shall be prohibited from inducing, by
any means, any person employed in the construction, completion or repair of public work, to give up any
compensation to which it is otherwise entitled. In addition, the Weekly Statement of Compliance required
by these Regulations shall also contain a statement that the fringe benefits paid are equal to or greater than
those set forth in the minimum wage decision.

41. CONTRACT TERMINATION - DEBARMENT
A breach of General Conditions Articles 11, 26, 33, 38, 39, 40, respectively entitled "Subcontracts",
"Payments to Contractor", "Minimum Wages", "Contract Work Hours Standards Act - Overtime
Compensation (40 USC 327-330)", "Payrolls and Basic Records", and "Compliance with Copeland
Regulations", may be grounds for termination of the Contract and for debarment as provided in 29 CFR 5.6.

42. CERTIFICATION OF NONSEGREGATED FACILITIES
(Applicable to Contracts and Subcontracts exceeding $10,000 that are not exempt from the provisions of
Article 32, "Nondiscrimination/Affirmative Action").

A. By entering into an agreement related to the work described in the Contract Documents the General
Prime Contractor, MEP Subcontractor or Subcontractor certifies that it does not maintain or provide for its
employees any segregated facilities at any of its establishments, and that it does not permit its employees to
perform their services at any location under its control where segregated facilities are maintained. The
General Prime Contractor, MEP Subcontractor or Subcontractor agrees that a breach of this certification is a
violation of General Conditions Article 32 "Nondiscrimination/Affirmative Action". As used herein, the
term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants
and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking
fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees on
the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. The General
Prime Contractor further agrees that (except where it has obtained identical certifications from proposed MEP
Subcontractors and Subcontractors for specific time periods) it shall obtain identical certifications from
proposed Subcontractors prior to provisions of the "Nondiscrimination/Affirmative Action" clause; that it shall
retain such certifications in its files; and that it shall forward the following notice to such proposed MEP
Subcontractors and Subcontractors (except where the proposed MEP Subcontractors and Subcontractors have
submitted identical certifications for specific time periods):

"NOTICE TO PROSPECTIVE MEP SUBCONTRACTORS AND SUBCONTRACTORS OF
REQUIREMENT FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES"

A Certification of Nonsegregated Facilities, as required by the May 9, 1967, order (32 Federal Register 7439,
May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior
to the award of a Subcontract exceeding $10,000 that is not exempt from the provisions of Article 32
"Nondiscrimination/Affirmative Action". The Certification may be submitted either for each Subcontract or
for all Subcontracts during a period, i.e., quarterly, semi-annually or annually.

B. The penalty for making false statements in Certifications required by Article 42.A. is prescribed in
18 USC 1001.
10. SCHEDULE OF OCCUPATIONAL CLASSIFICATIONS AND
MINIMUM HOURLY WAGE RATES (REPEALED)

The 2017-2019 Wisconsin State Budget (2017 Wisconsin Act 59) repealed Wisconsin’s prevailing
wage laws. Effective September 23, 2017, state prevailing wage requirements on state building
projects no longer apply. These changes take effect for projects advertised for bid after September
23, 2017. This change does not affect the Federal Davis Bacon Act requirements.

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SUBMITTAL LOG

If necessary for the project, insert the PDF version of the Submittal Log (original is an Excel Spreadsheet), as edited for the specific project, in this location of the specification manual.
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6. Soil Test Borings
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34. Tests and Adjustments
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36. Erosion Control and Storm Water Management
37. Air Quality Management
38. Construction Waste Management
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40. Record Documents
1. DEFINITIONS

In this document, the following terms are defined as:

(a) "Mechanical, electrical, or plumbing subcontractor" ("MEP Subcontractor") is a contractor that performs mechanical (Heating, Ventilating, and Air Conditioning), electrical, plumbing, or fire protection (fire suppression) work for the Project, and enters into a contract with the General Prime Contractor to perform their division of work.

(b) "Qualified bidder" means a contractor that the department certifies under Wis. Stat. s. 16.855(9m)(b)1.

(c) "Qualified responsible bidder" means a contractor who is a qualified bidder and who is a responsible bidder.

(d) "Responsible bidder" means a contractor that the department certifies under Wis. Stat. s. 16.855(9m)(b)2.

(e) "Single prime contracting" means bidding and contracting through a process in which only a general prime contractor has a contractual relationship with the state and all mechanical, electrical, or plumbing subcontractors are identified by the department and are subcontractors to the General Prime Contractor.

(f) “General Prime Contractor” is a contractor that enters into a contract with the state to perform all work as required by the Contract Documents and enters into contracts with subcontractors including MEP Subcontractors identified by DFD.

(g) “Non-MEP Subcontractor” is a subcontractor to a General Prime Contractor in divisions of work other than mechanical, electrical, plumbing, and fire protection. This includes suppliers and installers to the General Prime Contractor.

(h) “Subcontractor “is all subcontractors on a project. This includes MEP Subcontractors, subcontractors to the MEP Subcontractors, and Non-MEP Subcontractors.

(i) "Contractor" is all contractors working on a project regardless of contractual relationship. This includes the General Prime Contractor, MEP Subcontractors, Non-MEP Subcontractors, and all Subcontractors, regardless of tier of subcontract.

2. GENERAL

All articles in these General Requirements are applicable to all Divisions and Sections of the Work included herein. The Conditions of the Contract, General and Supplementary General Conditions, and these General Requirements shall apply with equal force and effect to the General Prime Contractor and all Subcontractors engaged in this work.

Contractor or the Contractor's authorized representative must be present to accept delivery of all equipment and material shipments. DFD’s representatives will not knowingly accept, unload or store anything delivered to the site for the Contractor's use. Inadvertent acceptance of delivered items by any representative or employee of the State shall not constitute acceptance or responsibility for any of the materials or equipment. It is the Contractor's responsibility to assume liability for equipment or material delivered to the job site.

3. SPECIAL SITE CONDITIONS

Confin all operations, equipment, apparatus and storage of materials, to the immediate area of work to the greatest possible extent. Contractor shall ascertain, observe and comply with all rules and regulations in effect on the project site, including but not limited to parking and traffic regulations, use of walks, security restrictions and hours of allowable ingress and egress. Any special traffic control during construction
involving lane closures shall be in accordance with the federal standard, Manual of Uniform Traffic Control Devices.

The Contractor shall take all measures necessary to become acquainted with the location of underground service, utilities, structures, etc., which may be encountered or be affected by the Contractor’s work, and shall be responsible for damage caused by neglect to provide proper precautions or protection. As a minimum to become acquainted with such underground appurtenances, the Contractor shall: 1) Observe existing conditions visible at the site immediately prior to commencement of work; 2) Review available site plans incorporated in the contract documents and/or provided by the DFD Project Representative; 3) Final check with the DFD Project Representative for additions to or changes from conditions indicated on site plans for the facility; and 4) Obtain input from the “one-call system”, the organization composed of all suppliers of utilities/services to or from the site.

Information pertaining to existing conditions that are described in the specifications or appear on the drawings is based on available records. 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. This information is provided to inform the Contractor of known existing conditions so that due diligence is taken by the Contractor to avoid damage. Where site observation or documents indicate existing underground utilities/services in close proximity (within four feet horizontally and/or four feet vertically) to necessary new construction work, the Contractor shall be responsible to test, probe or otherwise determine exact locations so as to prevent damage to such utilities/services.

Existing pipes, electrical work, and all other utilities encountered, which may interfere with new work, shall be re-routed, capped, cut off, or replaced by the Trades having jurisdiction, in accordance with the Bidding and Contract Documents.

Foundations are designed for soil pressure indicated. Because of variation in bearing capacity of the ground, some foundations may have to be revised after excavation has been completed. DFD’s Project Representative’s approval to proceed with foundation work must be obtained before concrete is poured. Changes in the work due to revisions of foundations because of unsatisfactory soil conditions will be classed as additional work.

[Note to Architect/Engineer: In accordance with Wisconsin Statute 182.0175(2), the architectural, mechanical and electrical designers are responsible to determine the location and condition of existing systems and components and indicate how existing systems and components are to be re-routed, protected from, and/or connected to the proposed work. The designers must use this information to appropriately revise the Division 1-General Requirements master specifications provided by Division of Facilities Development stated herein.

This section must include specific information about occupancy and scheduling for systems shutdown and how they affect this work. Information must also be given disclosing the location and condition of anything required to make these connections possible. For example: are there isolation valves where they are needed and if so, do they work? Everything possible must be done to eliminate unknowns from the bidding documents.

These things are part of the discovery and planning process for design and must be covered adequately in the documents to facilitate intelligent bidding and to avoid arguments and delays during construction. The designer may need to utilize the “one-call system” or a private locator service to facilitate this discovery and planning process.]
4. INSPECTION OF SURFACES

Contractor shall obtain complete data at the site and inspect surfaces that are to receive the Work before proceeding with fabricating, assembling, fitting or erecting any work under this contract.

Contractor shall notify DFD's Project Representative in writing in case of discrepancies between existing work and drawings, and of any defects in such surfaces that are to receive the Contractor's work. DFD's Project Representative will evaluate the notice and direct what remedial action will be taken.

Starting of work implies acceptance of existing work or the work of others. Removal and replacement of work applied to defective surfaces, in order to correct defects, shall be done at the expense of the Contractor who applied work to defective surfaces.

5. HAZARDOUS SUBSTANCES - ASBESTOS, LEAD AND POLYCHLORINATED BIPHENYLS (PCB'S)

Airborne asbestos fibers, lead, and PCB compounds, if encountered, have been determined to be hazardous to one's health. Compliance with all possible applicable regulations is the Contractor's responsibility.

Contractor shall not provide or install any product that contains any amount of asbestos or PCB. See General Requirements, CLEANING AND WASTE DISPOSAL for disposal of hazardous waste, if encountered.

ASBESTOS

Contractor's attention is directed to WAC NR 447, WAC DHS 159 and the Occupational Safety and Health Act (OSHA) in general, part 1926.1101--ASBESTOS in particular. Contractor is responsible for compliance with all applicable regulations when the work includes fastening to or coring through Asbestos Containing Materials (ACM) and disturbance of asbestos containing caulking and adhesives. The Contractor is responsible for removal and disposal of Category I non-friable ACM that will be disturbed by the work.

Unless otherwise indicated, all caulking, sealants, glazing compounds, gaskets, asphalt roofing materials, damp proofing and miscellaneous adhesives are assumed to contain asbestos and are considered to be Category I non-friable ACM as defined in NR 447. Waste material containing Category I non-friable ACM, is regulated as Construction and Demolition (C&D) waste and may be disposed of at a Department of Natural Resources (DNR) approved C &D waste landfill. If Contractor’s work methods cause non-friable ACM to become friable, the Contractor is responsible for the disposal of the friable asbestos waste at a landfill specifically approved by DNR to accept friable asbestos. A copy of the signed waste manifest for the disposal of all friable asbestos waste shall be provided to DFD prior to request for final payment.

The regulations referenced above require removal of friable ACM and Category II non-friable ACM prior to demolition of a building. Category I non-friable ACM does not need to be removed from a building prior to demolition if the waste generated from the demolition is taken to a DNR approved C & D waste landfill. If the contractor chooses to recycle building materials from a building to be demolished, the contractor is responsible for removal and disposal of all Category I non-friable ACM in accordance with applicable regulations prior to demolition. If the contractor's demolition methods will cause non-friable ACM to become friable, the contractor is responsible for removal and disposal of all Category I non-friable ACM in accordance with applicable regulations prior to demolition.

The following building materials have been identified to be ACM.

N/A

Lead Based Paint

Paint and glazed finishes on tile and masonry units is assumed to contain lead. The Contractor is responsible for compliance with Occupational Safety and Health Act (OSHA) in general and particularly to 29 CFR 1910 (LEAD STANDARD) and to CFR 1926 (LEAD EXPOSURE IN THE CONSTRUCTION INDUSTRY). Dispose of refuse containing lead based paint or contaminated with lead by the demolition process in conformance with State of Wisconsin Hazardous Waste Regulations set forth by the Department of Natural Resources and in conformance with OSHA and EPA recommended worker safety requirements.
PCB’s
Contractor's attention is directed to Wisconsin Administrative Code, Chapter NR 157 relative to PCB's. Refer to Division 26, Electrical within these specifications for work involving PCB's.

6. SOIL TEST BORINGS
Test borings have been made and boring data has been provided; however, these records do not form a part of the Contract Documents, but are provided for information only.

Neither the Architect/Engineer nor DFD guarantee continuity of conditions indicated at the boring locations.

Contractor must interpret the soil boring data and be satisfied as to the materials to be excavated and materials upon which fill or other materials may be placed.

7. MUTUAL RESPONSIBILITY
Contractor(s) shall coordinate the work with adjacent work and shall cooperate with all other trades to facilitate the general progress of the work. Each trade shall afford all other trades every reasonable opportunity for the installation of their work and for the storage of their material. In no case will the Contractor(s) be permitted to exclude from the premises or work, any other Contractor or employees thereof, or interfere with any other Contractor in the executing or installation of their work.

Contractor(s) shall arrange the work and dispose of materials so as not to interfere with the work or storage of materials of others and each shall join their work to that of others in accordance with the intent of the drawings and specifications.

All Contractors shall work in cooperation with the General Prime Contractor and with each other, and fit their work into the structure as job conditions may demand. All final decisions as to the right-of-way and run of pipe, ducts, etc., shall be made by DFD at prearranged meetings with responsible representatives of the Contractors involved.

8. PROJECT MEETINGS
Project meetings will be held at the time designated by DFD. Contractor, when requested, shall attend these meetings. If the principal of the firm does not attend meetings, a responsible representative of the Contractor who can bind the Contractor to a decision at the meetings shall attend.

The Architect/Engineer or a representative thereof will write a report covering all items discussed and decisions reached and copy of such report distributed to all parties involved.

9. SLEEVES AND OPENINGS
Each Contractor requiring sleeved openings shall furnish all sleeves required for their penetrations whether or not they responsible for providing the respective openings. Contractors furnishing sleeves to others for installation shall do this in a timely manner so as not to impede the project schedule.

Openings shown on the structural and/or architectural drawings shall be the responsibility of the General Prime Contractor. Sleeves furnished by other contractors for openings shown on the structural and/or architectural drawings shall be installed by the General Prime Contractor.

Openings that are required and are not shown on the structural and/or architectural drawings shall be the responsibility of the contractor requiring the openings. The contractor requiring the opening shall install sleeves for these openings or cut openings as needed (including floor openings within chases).
Individuals skilled in such work shall accomplish installation of sleeves and openings.

Each Contractor shall be responsible for coordinating locations of their sleeves with work of other trades.

10. CUTTING AND PATCHING

Provisions of Article 9. Sleeves and Openings herein, cover the work involved for providing and installing sleeves and openings.

Cutting and patching required to access work in existing walls, in chases, above inaccessible ceilings, below floors, etc., shall be by the Contractor who requires the access, unless shown in the bid documents otherwise or noted otherwise.

The Contractor shall do all cutting, or fitting of the work as required to make its several parts fit together, or to receive the work of others, as shown or reasonably implied by the drawings or specifications, or as may be directed by DFD. Holes cut in exterior walls and/or roofs shall be waterproofed.

The Contractor who cuts for required access to work shall also be responsible for patching. Where cutting and patching is required, Contractor shall hire individuals skilled in such work to do cutting and patching.

Except where specifically identified, the Contractor who removes or relocates building components which leave a remaining opening shall be responsible for patching the opening. Where building components are removed by the Asbestos abatement Contractor on behalf of a contractor, the Contractor on whose behalf the components are removed shall be responsible for patching the remaining opening.

Patching includes repairing openings to match adjacent construction and painting the surface to match existing. Painting means covering the entire wall where patching is to be done to nearest break point or corner unless indicated to be done by other trades.

Contractor shall not endanger any work by cutting, digging or otherwise and shall not cut or alter the work of others without their consent.

Do not pierce beams or columns without permission of DFD and then only as directed in writing. If any ductwork, piping, conduit, etc. is required through walls or floors where no sleeve has been provided, use a core drill or saw cut to prevent damage and structural weakening.

Wherever any material, finish, or equipment, is damaged, the skilled trade shall accomplish the repair or replacement, in that particular work and the cost shall be charged to the party responsible for the damage. DFD reserves the right to disallow any means and/or methods that, in the opinion of DFD, are harmful to and/or not in the best interest of preserving the improvements receiving the work.

11. MANUFACTURER’S DIRECTIONS

Contractors shall apply, install, connect, erect, use, clean and condition manufactured articles, materials, and equipment as recommended by the manufacturer, unless specified to the contrary. The manufacturer’s latest recommendations at the time of bidding shall be used.

12. LAYOUT

The General Prime Contractor shall immediately upon entering the site for purpose of beginning work, locate general reference points and take such action as is necessary to prevent their destruction. Each Contractor shall lay out its work and be responsible for all lines, elevations and measurements of the building and other work executed under its Contract. Each Contractor must exercise proper precaution to verify dimensions on
the drawings before laying out work and will be held responsible for any error resulting from failure to
eexercise such precaution.

Using datum furnished by the State, the lot lines and present levels have been established as shown on the
drawings. Other grades, lines, levels and benchmarks, shall be established and maintained by each
Contractor, who shall be responsible for them.

As work progresses, the General Prime Contractor shall lay out on forms and floor, the locations of all
partitions, walls and fix column centerlines as a guide to all trades.

The General Prime Contractor shall make provision to preserve property line stakes, benchmarks, or datum
point. If any are lost, displaced or disturbed through neglect of any Contractor, Contractor's agents or
employees, the Contractor responsible shall pay the cost of restoration.

Each Contractor shall verify grades, lines, levels, locations and dimensions as shown on drawings and report
any errors or inconsistencies to DFD’s Project Representative before commencing work. Starting of work
by each Contractor shall imply acceptance of existing conditions.

13. SUPERVISION

The General Prime Contractor shall take complete charge of the work under this contract and coordinate the
work of all Trades on the project.

14. FIELD OFFICES

The General Prime Contractor shall provide and maintain a temporary watertight office where directed for
use by the Contractor and Trades. The office shall be equipped with a plan rack and suitable table for
examination of plans.

The General Prime Contractor shall also provide and maintain a temporary office for the sole use of
Architect/Engineer and DFD’s Project Representative. The office shall be at least 150 square feet in floor
area, equipped with a plan rack, 3'-0" x 8'-0" smooth sloped top table, flat top desk, three chairs, and a four-
drawer legal size metal filing cabinet equipped with a workable lock.

Exterior of offices shall be of neat appearance, and if deemed necessary by DFD, shall be painted to achieve
such appearance; heat offices during cold weather; provide each office with at least one glazed movable
window and one door with a cylinder lock and latch set.

Provide and maintain artificial light, minimum of 40 foot-candles, and two duplex outlets where directed.
Provide screen door and window screens if requested. When directed, move the office into a suitable area in
the building.

If other offices are provided, they will be located as agreed to by the Contractor and approved by DFD.

A mobile type office with equivalent space and equipment may be used if Architect/Engineer and DFD’s
Project Representative have a separate office and separate entrance.

15. STAIRS AND SCAFFOLDS

The General Prime Contractor shall:

Furnish and maintain equipment such as temporary stairs, fixed ladders, ramps, chutes, runways and the like
as required for proper execution of work by all trades, and shall remove them on completion of the work.

Erect permanent stair framing as soon as possible. Provide stairs with temporary treads, handrails, and shaft
protection.
Contractors requiring scaffolds shall make arrangements with and compensate the General Prime Contractor for scaffolding, or shall provide their own and remove them upon completion of the work.

Each Contractor shall underlay its interior scaffolds with planking to prevent uprights from resting directly on the floor construction.

16. HOISTS, ELEVATORS OR CRANES
Each separate contractor shall provide and pay for its own hoist/crane or other apparatus necessary for unloading/setting or moving their equipment and materials. Installation and removal of equipment for this activity must be accounted for in the Project Schedule.

Equipment and operations for this activity shall comply with applicable Department of Safety and Professional Services and OSHA requirements. No material hoist may be used to transport personnel unless it meets Department of Safety and Professional Services and OSHA requirements for that purpose.

Contractors shall provide any protection required, temporary or long term, to prevent damage to work in place or in progress. When hoisting activity results in such damage, the responsible contractor shall pay for cleaning, repair or replacement of material or equipment as determined by DFD.

Equipment, that imposes loads of any kind on work in place, shall not be erected without agreement from DFD.

At their own discretion, two or more contractors may agree to use common hoisting facilities. Under such arrangements, the allocation of costs, access and scheduling and all other details of the agreement are the responsibility of the contractors involved.

Existing elevators may be used on a limited basis with DFD’s permission and agreement. Costs of warranty extensions and additional service work required will be paid by the using contractor. Appropriate protection must be provided by the using contractor and that contractor shall be responsible for any structural, mechanical or finish damage to the elevator and its parts and to adjoining building finishes and components.

17. SIGNS
The General Prime Contractor shall provide a job sign constructed of 3/4" thick exterior grade plywood. The size, colors and content shall conform to job sign detail which is included as an appendix to these General Requirements. The General Prime Contractor shall order, paint and erect the sign. The sign shall be placed on the property where directed and shall be maintained for the duration of the construction period.

No individual advertising signs, plaques or credits, temporary or permanent, will be permitted on the building or premises, except the name of the Contractor on Contractor's office or material shed.

18. FENCE
The General Prime Contractor shall provide a neat appearing protective fence where indicated on the drawing, constructed of standard studded T-Posts of sufficient length for line posts and spaced not to exceed 8'-0" apart. Corner posts and gate posts are to be galvanized steel pipe of not less than 2 1/2" o.d. and shall be properly braced. A 4-foot high wooden snow fence shall be securely fastened to the supports. Plastic fencing is not acceptable. The snow fence shall project 4" above the fence posts. Provide gates, properly constructed and braced, complete with hinges, hasps, and padlocks in number and location required for proper control, delivery and distribution of material and equipment. Gate posts shall be adequately back tied and anchored to insure a rigid installation. All protective fencing shall be maintained in an upright, orderly fashion throughout the construction schedule. In areas where existing trees are to be protected, the area inside the protective fencing shall not be used for any purpose related to construction activities, such as material storage, vehicle parking, portable toilets, or other disruptive activities that would result in damage of any kind to the site inside the fence.
19. ROADWAY
The General Prime Contractor may build a temporary roadway for delivery of materials at the Contractor's own expense and maintain it until completion of construction or until service drives are installed. Where possible, build temporary roadway within the confines of the new roadway and allow others to use it at no cost. Any gravel topping used for temporary roadway shall be at least 6" below finished elevation of permanent drives. If temporary roadway is not intended to be converted to a permanent road, all road materials shall be removed upon termination of access need, and the confines of the temporary roadway shall be repaired to match adjacent area.

20. TOILETS
The General Prime Contractor shall provide and maintain sanitary temporary toilets, located where directed by DFD's Project Representative, in sufficient number required for the force employed. The toilets shall comply with International Building Code Chapter 29 on Plumbing Systems. Toilets shall be self-contained chemical type.

As soon as conditions will allow, the Plumbing Trade shall provide temporary toilets within the building, where directed, and equip the room with at least two temporary water closets and one temporary lavatory, each with connections to cold water and sanitary sewer. The General Prime Contractor shall provide a temporary wood enclosure with doors; remove when directed.

After directed by DFD's Project Representative, the Plumber shall remove the temporary fixtures and replace them with permanent fixtures.

After temporary toilet accommodations are provided within the building, the General Prime Contractor shall remove the temporary outside toilets.

The General Prime Contractor shall maintain the temporary toilets in a sanitary condition at all times and shall supply toilet paper until completion of the job.

21. TELEPHONES
It is expected that each contractor have access to their own cell phone for their own use. No additional telephone service will be provided.

22. WATER SUPPLY
The General Prime Contractor shall supply all water required for construction and other purposes until the permanent water supply system is accepted and in operation.

Immediately after award of contract, the Plumbing Trade shall make arrangements for temporary connections and extension of existing water service facilities. As soon as possible, the Plumbing Trade shall install the permanent main into the building and provide a temporary gate valve, extend piping, provide temporary water meter, and provide two 3/4" hose bibbs on each floor, located where directed. Permanent risers may be used for temporary service. Provide two 3/4" hose bibbs outside of the building at suitable locations for construction purposes where directed.

The Plumbing Trade shall supply, maintain the installation, and remove it when directed by DFD's Project Representative. The General Prime Contractor shall provide necessary patching of surfaces and structure after such temporary service is removed.

The General Prime Contractor shall prevent waste of water and shall maintain valves, connections, and hoses in perfect condition, at all times. Trades shall provide their own hose or piping from hose bibbs.

The Contractor shall pay cost of water used.
Immediately after award of contract, the Plumbing Trade shall make arrangements to begin underground sewer work and shall complete sewer work, including backfilling required, as soon as possible.

23. TEMPORARY ELECTRICAL WORK
The General Prime Contractor shall make all arrangements with the local utility company for metered electrical service, pay for the installation of all temporary service to utility point of termination shown on drawings, and upon completion of project, pay for removal of temporary service. The General Prime Contractor shall patch surfaces and structure after services have been removed. The service shall be 120/208 volt, 3 phase, 4 wire, 400 amps.

If a Contractor contemplates the use of equipment that requires a different voltage or greater capacity than that specified, then that Contractor must arrange with Utility for this additional service and pay for installation of the service and the necessary additional switches and wiring required.

The meter shall be taken out in the General Prime Contractor’s name.

The General Prime Contractor shall pay for all electrical energy consumed for construction purposes for all trades including temporary offices, for operation of ventilating equipment, for heating of building, and for testing and operating of all equipment. The General Prime Contractor shall continue to pay for energy used until substantial completion even though equipment has been connected to the permanent wiring.

Any Trade that has a temporary office shall provide and pay for installation of temporary service for lighting of such temporary office.

The Electrical Trade shall provide meter base and wiring to point of utility termination, provide main fused service switch, and fused or breaker distribution panel(s). The Electrical Trade shall also provide, at no cost to others, all lamps, wiring, switches, sockets and similar equipment required for temporary system until substantial completion. Upon completion of the project, the Electrical Trade shall remove the temporary system.

The temporary lighting system shall be sufficient to enable all trades to safely complete their work and to enable DFD’s Project Representative to check all work as it is being done. Illumination shall be 5 foot-candles minimum in all areas and, in addition, shall meet or exceed the requirements of 29 CFR 1926.56 Illumination (OSHA regulations).

Provide at least one duplex outlet for small power tools for each 400 square feet of floor space, 120 volt single phase. Circuits shall be 20 ampere, single pole.

In accordance with the latest issue of the National Electrical Code, all temporary electrical circuits for construction purposes shall be equipped with combination ground fault interrupter and circuit breakers meeting the requirements of UL for Class A, Group 1 devices. The ground fault interrupter portion shall be solid state type, insulated and isolated from the breaker mechanism. A test button shall be provided for checking the device. The breaker mechanism shall provide overload and short circuit protection and shall be operated by a toggle switch with overcenter switching mechanism so that contact cannot be held closed.

All Trades shall furnish their extension cords and lamps other than those furnished for general lighting.

All Trades and other separate Contractors shall be allowed to use the service provided for general lighting and fractional horsepower hand tools at no cost.

The General Prime Contractor shall be compensated by those requiring three phase and single-phase energy used for equipment other than fractional horsepower hand tools. Arrangements shall be made with the General Prime Contractor before construction equipment is used.
The General Prime Contractor shall post the cost rates at start of construction. Rates may be posted on an hourly use basis or energy may be submetered at the General Prime Contractor's option, but shall be based upon a fair and reasonable estimate of the cost of power used as billed by the Utility.

Those trades requiring lighting or other electrical service outside of building shall pay for the installation and removal of service, maintenance charges, and energy consumed.

Trades requiring voltage other than basic temporary system specified, three phase power, or a special single phase run, for operation of construction equipment or testing shall make their own arrangements with the General Prime Contractor for cost of energy used, and the Electrical Trade for the cost of installation, and removal when no longer required.

Heating and Ventilating Trade shall provide wiring, equipment and connections for portable or temporary heating units.

The Electrical Trade shall expedite the work under this 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 portions of heating and ventilating system for temporary heating during construction. Permanent wiring and connections may be used at permanent equipment; however, the use of the permanent system during construction shall in no way waive any part of the guarantee period.

After Substantial Completion of the permanent electrical system and building wiring, permanent receptacles may be used during finishing work. Permanent wiring for lighting fixtures, switches and receptacles shall be installed only after all masonry and plastering has been completed, but this wiring shall not be used for motors larger than fractional HP or for welding equipment. Circuits for larger motors and welding equipment may be provided with special circuits to mains of electrical panels at the expense of those trades requiring them, provided that special permission is obtained from DFD's Project Representative and the installation is made by skilled electricians.

24. COLD WEATHER PROTECTION

All heating and protective covering, required to protect the work from injury due to freezing and moisture during the construction period and prior to enclosure of the building, shall be classed as COLD WEATHER PROTECTION. Such protection shall be provided and paid for by the General Prime Contractor.

Heat required to protect materials from injury due to freezing during the construction period and prior to enclosure, shall be provided by means of portable heating units intended for this purpose.

All heating units must be approved types. 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.

If electrical power is required for oil or gas portable heating units, it may be taken from the available temporary power source and paid for by the General Prime Contractor.

Heating units and the area surrounding the units shall be kept in a clean and safe condition.

25. ENCLOSURE

Before the building, or portion thereof, can be considered enclosed, the General Prime Contractor shall have advanced the construction of the building to conform with the following requirements.

The exterior walls should be erected to full thickness and height shall extend to the top of the horizontal level which encloses the space intended to receive heat. If erection of full thick walls is not feasible, erection of
back-up wall only will be accepted if approved weatherproofing of back-up materials is provided to avoid
damage to back-up materials.

The horizontal slab, which will serve as the overhead enclosure of the spaces to receive heat (whether it be
the roof slab or intermediate floor slab), shall have all openings covered with closures capable of sustaining
any loads imposed thereon. The entire overhead enclosure shall be made weatherproof.

Provide approved translucent material for temporary enclosure of window openings if they have not been
glazed. Plain or reinforced polyethylene film or other suitable translucent material will be acceptable,
provided it is installed in or on a well fitting rigid wood frame and kept in good repair. This means of
temporary enclosure shall be used for other minor openings in walls.

Construct temporary walls as required to protect contents and to separate the interior enclosed sections from
the interior open section of the building during construction. Temporary wall enclosure shall consist of
plywood panels, at least 3/8" thick, fastened to wood framework, consisting of 2 x 4 studs spaced 24" o.c.,
securely spiked to wood plates, top and bottom. Provide intermediate girts between studs spaced as required for
fastening of plywood. Temporary walls must provide protection from dirt, dust, and drafts.

Provide exterior doors with hinges, self-closing device, and locks.

Make suitable provisions for passage of air to permit proper drying out of the building.

At end of day's work, securely close temporary enclosures. Padlock exterior doors. The General Prime
Contractor shall supervise effectiveness of enclosures.

Where reference is made to a "portion of the building", it is intended to mean definable areas of the building
such as a group of floor levels or an entire wing of the building. It is not intended to require a room-by-room
or erratic piece-meal enclosure operation, but shall provide for an orderly expansion of large adjacent or
related areas to be enclosed which are advantageous to the progress of the work and approved by DFD's
Project Representative.

27. FIRE PROTECTION

The General Prime Contractor shall provide and maintain in working order during the entire construction
period, a minimum of three (3) fire extinguishers on each floor level, including basement of the building, and
one (1) in temporary office. Extinguishers shall be nonfreeze type such as A-B-C rated dry chemical, of not
less than 10-pound capacity each. In addition, any Subcontractor who maintains an enclosed shed on the site
shall provide and maintain, in an accessible location, one or more similar nonfreezing type fire extinguisher
in each enclosed shed.

Fire alarm systems and fire suppression systems shall be kept in service during construction. The General
Prime Contractor shall impair system operability only as necessary to avoid false alarms, false activations or
damage and where required to complete construction activities. The General Prime Contractor is responsible
for the first responder cost of repeat false alarms.

Where systems are impaired, provide a fire protection impairment program in compliance with NFPA 25,
NFPA 72, NFPA 101, IFC Chapter 9 and the Authority Having Jurisdiction (AHJ) including the following:

- Written notification to DFD’s Construction Representative, the Agency Impairment Coordinator
  (to be assigned at the preconstruction meeting), first responders and the fire department of the dates,
times and extent of system impairments and system restorations and description of contractor actions
  minimizing risk.
- Temporary bagging or removal of smoke detectors during the work day with restoration of smoke
detectors at end of the work day.
- Confirmation that systems are fully operational at the end of the work day before leaving the job site.
- An approved fire watch or other approved procedures where systems are disabled beyond the work day or where required by the DFD Project Representative, the Agency Impairment Coordinator, first responders or the fire department.
- Tags indicating which system or system component has been impaired placed at each fire department connection, affected control valve and alarm panel. Remove tags after restoration.
- Tags listing temporary fire alarm notification procedures on all non-functional fire alarm devices including pull stations, automatic detectors and audio/visuals. Remove tags after restoration.
- Daily log of system impairments and restorations.

28. WATCHPERSONS

Watchpersons will not be furnished by the State. The Contractor shall provide such precautionary measures, to include the furnishing of watchpersons if deemed necessary, to protect persons and property from damage or loss where the Contractor's work is involved.

29. STORAGE OF MATERIALS

Contractor shall confine equipment, apparatus, storage of materials and operations to limits indicated on the drawings or by specific direction of DFD's Project Representative and shall not bring material onto the site until they are needed for the progress of the work.

The storage of materials on the grounds and within the building shall be in strict accordance with the instructions of DFD's Project Representative. Storage of materials within the building shall at no time exceed the design carrying capacity of the structural system.

Provide and maintain watertight storage sheds on the premises where directed, for storage of materials that might be damaged by weather. Sheds shall have wood floors raised at least 6" above the ground.

All materials affected by moisture shall be stored on platforms and protected from the weather.

All materials shall be stored in a manner that prevents release of hazardous material to the environment.

All hazardous materials, including motor fuels, shall be properly handled and contained to prevent spills or other releases. The General Prime Contractor shall develop and maintain a contingency plan to provide emergency response, containment, and cleanup of spills of hazardous materials resulting from contract activities. All spills and releases shall be reported to DFD as soon as possible.

During the construction of this building, materials, construction sheds, and earth stockpiles shall be located so as not to interfere with the installation of the utilities nor cause damage to existing lines.

The Contractor shall allot space to others for storage of their materials, and erection of their sheds.

Should it be necessary at any time to move material sheds or storage platforms, the Contractor shall move same at the Contractor's expense, when directed by DFD's Project Representative.

The State assumes no responsibility for materials stored in building or on the site. The Contractor assumes full responsibility for damage due to the storage of materials.

Repairing of areas used for placing of sheds, offices, and for storage of materials shall be done by the Contractor.
30. PROTECTION OF FINISHED CONSTRUCTION
Contractor shall assume the responsibility for the protection of all finished construction under the Contract and shall repair and restore any and all damage of finished work to its original state.

Wheeling of any loads over any type of floor, either with or without plank protection, will be permitted only in rubber tired wheelbarrows, buggies, trucks or dollies.

Where structural concrete is also the finished surface, care must be taken to avoid marking or damaging those surfaces.

31. PROTECTION IN GENERAL
All structures and equipment shall be constructed, installed and operated with guards, controls and other devices in place.

Temporary pumps required for pumping water from building excavation or from building proper shall be provided by the General Prime Contractor, including temporary connections. Plumbing Trade shall install permanent sump basins and piping where and when required. Permanent sump pumps shall not be installed until building is substantially complete and when approved by DFD's Project Representative. The General Prime Contractor shall remove temporary pumps and connections when approved by DFD's Project Representative.

The General Prime Contractor shall:

Provide, erect and maintain all required planking, barricades, guard rails, temporary walkways, etc., of sufficient size and strength necessary for protection of stored material and equipment; paved surfaces, walks, curbs, gutters and drives; streets adjacent to or within project area; adjoining property and all project work to prevent accidents to the public and the workmen at the job site.

Notify adjacent property owners if their property interferes with the work so that arrangements for proper protection can be made.

Provide and maintain proper shoring and bracing to prevent earth from caving or washing into the building excavation. Provide temporary protection around openings through floors and roofs, including elevator openings, stairwells, and edge of slabs.

Provide and maintain proper shoring and bracing for existing underground utilities, sewers, etc., encountered during 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.

Provide protection against rain, snow, wind, ice, storms, or heat to maintain all work, materials, apparatus, and fixtures, incorporated in the work or stored on the site, free from injury or damage. At the end of the day's work, cover all new work likely to be damaged. Remove snow and ice as necessary for safety and proper execution of the work.

Protect the building and foundations from damage at all times from rain, ground water and back-up from drains or sewers. Provide all equipment and enclosures as necessary to provide this protection.

Damaged property shall be repaired or replaced in order to return it to its original condition. Damaged lawns shall be replaced with sod.

Protect materials, work and equipment, not normally covered by above protection, until construction proceeds to a point where the general building protection of the area where located, dispenses with the necessity therefore. Protect work outside of the building lines such as trenches and open excavations, as specified above.
Take all necessary precautions to protect the State's property as well as adjacent property, including trees, shrubs, buildings, sanitary and storm sewers, water piping, gas piping, electric conduit or cable, etc., from any and all damage which may result due to work on this project.

Repair work outside of property line in accordance with the requirements of the authority having jurisdiction.

Repair any work, damaged by failure to provide proper and adequate protection, to its original state to the satisfaction of DFD or remove and replace with new work at the Contractor's expense.

Protect trees indicated on the drawings to remain and trees in locations that would not interfere with new construction, from all damage. Do not injure trunks, branches, or roots of trees that are to remain. Do cutting and trimming only as approved and as directed by DFD's Project Representative.

The value of trees destroyed or damaged will be charged against the account of the Contractor responsible for the damage in an amount equal to the expense of replacing the trees with those of similar kind and size, but not to exceed $1000.00 for any one tree.

32. CLEANING AND WASTE DISPOSAL

Contractor shall be responsible for all cleaning required within the technical sections of the specifications governing work under the Contractor's jurisdiction as well as for keeping all work areas, passageways, ramps, stairs and all other areas of the premises free of accumulation of surplus materials, rubbish, debris and scrap which may be caused by the Contractor's operations or that of the Subcontractors.

Remove rubbish, debris and scrap promptly upon its accumulation and in no event later than the end of each week.

Combustible waste shall be removed immediately or stored in fire resistive containers until disposed of in an approved manner.

No burning of rubbish or debris will be allowed at the site. Rubbish, debris and scrap shall not be thrown through any window or other opening, or dropped from any great height; it shall be conducted to the ground, to waiting truck(s) or removable container(s) by means of approved chutes or other means of controlled conveyance.

Form and scrap lumber shall have all nails withdrawn or bent over; shall be neatly stacked, placed in trash bins, or removed from the premises.

Spillages of oil, grease or other liquids which could cause a slippery or otherwise hazardous situation or stain a finished surface shall be cleaned up immediately.

Waste materials removed from the site shall be managed by the contractor and disposed of in accordance with all applicable laws, regulations, codes, rules, and standards. Materials that meet the definition of a hazardous waste (Wis. Admin. Code NR 600) shall be disposed through the State's hazardous waste service contract (Posted on Vendornet [https://vendornet.wi.gov/Contracts.aspx](https://vendornet.wi.gov/Contracts.aspx); search for “hazardous wastes service”), unless otherwise directed in writing by DFD. The Contractor shall prepare all hazardous wastes for transport and disposal. Arrangements for disposal shall be coordinated through DFD's Project Representative. Charges for transport and disposal of hazardous waste by the State's hazardous waste service contractor will be paid directly by the State. Other materials such as soil, debris, sludge, water, etc. generated by project activities which may contain constituents exceeding federal, state, or local environmental cleanup standards must not be removed from the site, or treated and disposed on site without prior written approval of DFD. DFD will provide a list of acceptable offsite disposal or treatment facilities for disposal by
Contractor. Other unused or discarded materials may be treated as solid waste. Facilities for recycle, disposal or landfill of such items shall be approved by DFD prior to removal from the site.

Dust, dirt and other foreign matter shall be removed completely from all internal surfaces of all mechanical and electrical units, cabinets, ducts, pipes, etc.

Dirt, soil, fingerprints, stains and the like, shall be completely removed from all exposed finished surfaces.

General Prime Contractor shall wash all glass immediately prior to the occupancy of this project. Work shall include the removal of labels, paint splattering, glazing compound and sealant. Surfaces shall include mirrors and both sides of all glass in windows, borrowed lights, partitions, doors and side lights.

Broken, scratched or otherwise damaged glass shall be replaced by the General Prime Contractor.

In addition to the above, the General Prime Contractor shall be responsible for the general "broom" cleaning of the premises and for expediting all of the cleaning, washing, waxing and polishing required within the technical sections of the specifications governing work under this Contract. The General Prime Contractor shall also perform "final" cleaning of all exposed surfaces to remove all foreign matter, spots, soil, construction dust, etc., so as to put the project in a complete and finished condition ready for acceptance and use intended.

If rubbish and debris is not removed, or if surfaces are not cleaned as specified above, DFD reserves the right to have said work done by others and the related cost(s) will be deducted from monies due the Contractor.

33. OPERATING AND MAINTENANCE MANUALS AND INSTRUCTIONS

Contractor shall provide DFD with two (2) sets of the O&M data for each device, piece of equipment and assembly furnished and/or installed under this contract. Format shall be paper, indexed and labeled and bound in three-ring binders. In addition to the hard copies provide electronic (PDF) copies of the O&M manuals to the AE. Also include, the electronic media (CD or flash drive) in 3 hole vinyl holders in binders.

The O&M manuals shall include the following:

- Table of Contents
- Contact information (including emergency contact number) for installing contractor, original vendor manufacturer and service provider
- Copy of approved submittals
- As-built control drawings and sequences of operations
- Catalog data or literature with correct model number checked
- Manufacturer’s installation and operation instructions including start-up, break-in, shutdown, seasonal, emergency and special operation procedures
- Manufacturer’s maintenance instructions including procedures and instructions for problem corrections, preventive maintenance, testing, alignment, adjustment and repair
- Complete parts list in an exploded view diagram of the equipment
- Construction Verification Checklists
- Inspection and testing reports
- Maintenance records indicating maintenance performed by contractor prior to substantial completion
- Equipment warranties including terms and conditions and date of inception (substantial completion) and date of expiration
- List of special tools or testing equipment required for the operation, testing or maintenance of the equipment
- For items assembled by the Contractor for special functions, write operating and maintenance instructions

Contractor shall submit to A/E for review, make revisions noted by A/E and provide final O&M data for A/E’s review 30 business days prior to training. Any revisions or changes to the systems and/or equipment
post delivery of the final O & M data submittal must be submitted to A/E as an addendum within 30 days of the revision or change.

34. TESTS AND ADJUSTMENTS
The complete installation consisting of the several parts and systems and all equipment installed according to the requirements of the Contract Documents, shall be ready in all respects for use by the User Agency and shall be subjected to a test at full operating conditions and pressures for normal conditions of use.

Contractor shall make all necessary adjustments and replacements affecting the work which is necessary to fulfill DFD's requirements and to comply with the directions and recommendations of the manufacturer of the several pieces of equipment, and to comply with all codes and regulations which may apply to the entire installation. Contractor shall also make all required adjustments to comply with all provisions of the drawings and specifications.

35. LOOSE AND DETACHABLE PARTS
Contractor shall retain all loose and small detachable parts of apparatus and equipment furnished under this Contract, until completion of the work and shall turn them over to DFD's Project Representative designated to receive them. Contractor shall obtain from DFD an itemized receipt thereof in triplicate. Contractor shall retain one copy of receipt for their files and attach the other two to request for final payment for the work.

36. EROSION CONTROL AND STORM WATER MANAGEMENT
In accordance with state law, where applicable, and what the Department of Administration believes to be good soil conservation practices and pollution prevention, the General Prime Contractor shall be governed by the following:

The General Prime Contractor hereby covenants to maintain all project grounds, public streets and associated areas, including fill areas in a manner consistent with state laws and the general policy to conserve soil and soil resources, and to control and prevent soil erosion and to control and prevent siltation into waters of the state. This clause is to be liberally construed to further the above stated objectives. The following shall include, but not limit areas in which control is to be executed:

Erosion Control Plan: Implement the erosion control plan developed for the project and maintain erosion control practices throughout the construction period. Modifications to the erosion control plan, addressing phases of construction shall be the responsibility of the General Prime Contractor. Erosion control practices that are compromised as the result of construction activity shall be returned to their functioning state by the end of the current work day. Where applicable, erosion control practices shall comply with Chapters NR 151 and 216, Wis. Adm. Code.

Minimum Stripping: Limit stripping of sod and vegetation and limit land disturbance to an area and a time period that will expose bare soil to least possibility of erosion that construction requirements will allow.

Stockpiling: Materials, including soil, shall be stored and protected in a manner that will prevent runoff of material from the stockpiles into streets, drainage facilities, storm sewer systems, or waters of the state in the event of rain.

Soil Erosion and Erodible Materials: Take positive measures to prevent soil erosion from the construction area and areas disturbed by construction activities by employing such means as seed and mulch, mulches, intercepting embankments and berms, sedimentation basins, ditch checks, riprap, erosion mats, silt fence, approved polyacrylamides, inlet protection, or other temporary erosion control devices or methods.

Record Keeping: Maintain a copy of the current erosion control plan on site. Maintain maintenance records and inspection logs on-site for erosion control and storm water management practices. Contractor shall provide project representative with a weekly maintenance and inspection report.
Street Maintenance: Control the tracking of soil onto street and paved surfaces to a minimum. Any such tracking shall be removed no less than on a daily basis.

Storm Water Management: Practices installed for post-construction storm water management shall be protected during construction activity, and in the event that their intended function becomes compromised during construction activity, shall be restored and/or repaired according to Chapters NR 151 and 216, Wis. Adm. Code, for post-construction storm water management.

Erosion control and storm water management practices shall be installed and maintained in accordance with the WDNR approved technical standards available at the following website:

Responsibility and authority for inspections are vested in the Department of Administration through the Division of Facilities Development.

Responsibility and authority for maintaining records for NR 216 is the responsibility of the General Prime Contractor.

37. AIR QUALITY MANAGEMENT
In accordance with the Department of Administration’s air quality management practice on Ozone Action Days, all contractors shall reduce or limit emissions and particulate matter that adversely affect air quality.

The General Prime Contractor shall establish the action plan, in cooperation with other contractor(s), concerning implementation of air quality management on Ozone Action Days. This plan shall include suspending work or modifying operations for all activities related to ozone, volatile organic compounds (VOC) and nitrogen oxide emissions. These work activities include but are not limited to the following:

- Limit equipment and vehicle refueling to after 6 pm.
- Limit use of gasoline-powered vehicle and equipment.
- Limit excessive idling of diesel-powered vehicle and equipment.
- Limit large scale painting with VOC.
- Limit large scale asphalt roofing and paving.
- Limit and/or control all dust creating activities.

For information on air quality readings on Ozone Action Days refer to:
1-866-324-5924; or
http://www.dnr.state.wi.us/org/aw/air/wisards/state.htm

38. CONSTRUCTION WASTE MANAGEMENT
See Section 01 74 19 – Construction Waste Management.

39. GUARANTEE DOCUMENTS
Upon Substantial Completion of project, the Contractor shall submit such written guarantees and bonds to DFD for presentation to the User Agency. Furnish guarantees in triplicate unless otherwise indicated.

40. RECORD DOCUMENTS
On a suitable set of Contract Documents, the contractor is to maintain a daily record of changes and deviations from the contract. All buried or concealed piping, conduit, or similar items shall be located by dimensions and elevations on the record drawings.

The daily record of changes shall be the responsibility of Contractor's field superintendent. No arbitrary mark-ups will be permitted.

Once during the month the Contractor shall present, at the project, the job copy showing variations and changes to date to the Architect/Engineer and DFD Project Representative for their review.
At substantial completion of the project, the Contractor shall transmit the marked up as-built documents to
the Architect/Engineer and copy the DFD Project Representative on the transmittal of the documents. The
A/E will incorporate the contractor marked up as-built drawings into the record drawings.

In addition to providing marked up drawings to the AE, the contractor shall provide (when available)
electronic drawing drawings for all contractor generated drawings to the AE. Drawing shall include but not
be limited to:

- Contractor coordinated BIM models
- Fabrication, erection and installation drawings for:
  - Ductwork and piping
  - Steel
  - Concrete
  - Special process systems
  - Lighting controls
  - Audio Visual
  - Telecommunications
- DSPS approved submittals for:
  - Fire Protection
  - Fire Alarm
  - Structural
  - Elevator

***
PREPARATION OF ADDENDA  (Rev 11/2017)

The Addendum, like all other documents to the Contract, must follow a certain format and contain the necessary information which will clearly identify it with the Contract Documents and to be made a part thereof.

The Addendum shall have a heading which provides the Addendum number, date of issue, project title, location, and project number. The bid closing time and date shall always be included in the Addendum. A standard paragraph will then follow which stipulates the purpose of the Addendum.

The body of the addendum should consist of four parts AS APPLICABLE: Changes to Bidding Requirements, Changes to Conditions of Contract, Changes to Specifications and Changes to Drawings. Should one or more of these parts not be changed, do not include that part’s title in the addendum.

Addendum change items must refer to a specific document within the project manual or drawings and shall be listed in the Addendum in the same numerical sequence as they occur in the original documents. Each addendum item should be identified by a unique, consecutive number (1, 2, 3, etc.).

Items referencing specifications shall include the following, in the order listed: Section number and title, page number, line number, and then pertinent information concerning the item being changed.

Items referencing drawings shall include the following, in the order listed: Drawing Sheet Number, word description of item being changed such as 1st Floor plan, Door Schedule, North elevation, etc.; detail or section number; followed by description of change.

Closing on the Addendum shall consist of the title block for the Architect/Engineer and for the Division of Facilities Development. A sample Addendum is appended to this manual.

Holding addendum information for consolidation into one large addendum is not desired. The Architect/Engineer shall endeavor to release addenda in sufficient time for Bidders to review and incorporate into their bids. Bidders are requested to bring inadequacies, omissions or conflicts to Architect/Engineer’s attention. THE A/E SHALL SUBMIT THE ADDENDUM TO DFD AT LEAST 10 DAYS PRIOR TO BID OPENING. The addendum will then be issued by DFD no less than 7 days prior to Bid Opening. Approval from DFD must be obtained to waive this requirement. If this requirement is waived, and the addendum is issued less than 7 days prior to bid opening, it shall contain an extension of the bid opening date for no less than 7 days from the present bid opening date.

Any change to the Bid Form by addendum shall require that the complete corrected Bid Form be reissued rather than only reference the changes to be made. The corrected Bid Form shall have a heading to read: "REVISED BID FORM" and have page numbers C-1(REV), C-2(REV), etc.

Addenda are to be submitted electronically following the bidding documents’ electronic process. Drawings are to be completed per the DFD CAD Standards Manual - Addenda Submittal Exception - The PDF text and drawings shall be incorporated into one PDF document even if large full format drawings are required. The complete PDF addenda shall then be submitted to the DFD SharePoint site previously indicated. The files shall be named according to file naming standards.

DFD will issue an addendum if a successful MEP bid is withdrawn or rejected after the MEP Subcontractors have been identified but before the General Prime Contractor bid opening. This addendum will include a revised list of successful MEP bids that must be included in General Prime Contractor bids and will move the General Prime Contractor bid opening five days later to allow bidders sufficient time to update their bids based on the revised MEP list.
ADDENDUM NO.   (Rev 01/2017)
ISSUE DATE:  

RE:  |City of Durand Industrial Park
     Division Project No. 00001

BID OPENING:  2:00 p.m. on the 27 of February

FROM:  Northlands Design Company,
       1415 Engineering Dr.
       Madison, WI 53706

TO: Prospective Bidders

This addendum forms a part of the Contract Documents and modifies the original Contract Documents dated [Insert date of bidding documents] as noted below. Acknowledge receipt of this Addendum by inserting the number and issue date of this addendum in the blank space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of [Insert number of pages] and the attached documents [Insert document titles, page numbers and dates, as applicable.]

CHANGES TO BIDDING REQUIREMENTS:
1.

CHANGES TO CONDITIONS OF THE CONTRACT:
2.

CHANGES TO SPECIFICATIONS (DIVISIONS 2 THRU 33):
3.

CHANGES TO DRAWINGS:
4.

END OF ADDENDUM

Northlands Design Company
1415 Engineering Dr.
Madison, WI 53706

Division of Facilities Development
Department of Administration
Madison, Wisconsin 53707-7866
Technical Specifications

Section 2
SECTION 03 30 00
CAST-IN-PLACE CONCRETE
BASED ON DFD MASTER SPECIFICATION DATED 8-28-2019
PART 1 - GENERAL

SCOPE
Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes. The work under this section consists of providing all work, materials, labor equipment and supervision necessary to provide cast in-place concrete as required in these specifications and the drawings.

PART 1 - GENERAL
Scope
Related Work
References
Definitions
Pre-Installation Meetings
Submittals
Quality Assurance
Mock up
Delivery, Storage, and Handling
Field Conditions

PART 2 - PRODUCTS
Form-facing Materials
Steel Reinforcement
Reinforcement Accessories
Concrete Materials
Admixtures
Fiber Reinforcement
Waterstops
Vapor Retarders
Floor And Slab Treatments
Liquid Floor Treatment
Curing Materials
Related Materials
Repair Materials
Concrete Mixtures, General
Fabricating Reinforcement
Concrete Mixing

PART 3 - EXECUTION
Formwork
Embedded Items
Removing And Reusing Forms
Shores And Reshores
Vapor Retarders
Steel Reinforcement
Joints
Waterstops
Concrete Placement
Finishing Formed Surfaces
Finishing Floors And Slabs
Quantification of Relative Humidity at 40% of Concrete Thickness
Quantifying Ph Level
Miscellaneous Concrete Items
Concrete Protecting And Curing
Liquid Floor Treatments
Joint Filling
Concrete Surface Repairs
Field Quality Control
Protection Of Liquid Floor Treatments

RELATED WORK
Applicable provisions of Division 1 govern work under this Section.

Related work specified elsewhere:

033300 - Architectural Concrete: General building applications of specialty finished formed concrete.
035300 - Concrete Topping: Emery- and iron-aggregate concrete floor toppings.
042011 - Concrete Unit Masonry
055016 - Miscellaneous Metal for Utilities
071016 - Waterproofing for Utilities
312000 - Earth Moving: Drainage fill under slabs-on-grade
321313 - Concrete Paving: Concrete pavement and walks
321316 - Decorative Concrete Paving: Decorative concrete pavement and walks

Section 00 00 00 – (Section Title)
Section 00 00 00 – (Section Title)

REFERENCES
Incorporated Guides and References

American Concrete Institute (ACI):
ACI 302.1R – Guide for Concrete Floor and Slab Construction.
ACI 304R – Guide for Measuring, Mixing, Transporting and Placing Concrete.
ACI 304.2R - Placing Concrete by Pumping Methods.
ACI 305R - Hot Weather Concreting.
ACI 309R – Guide for the Consolidation of Concrete.
ACI 347 – Guide to Formwork for Concrete.

Specifications

American Concrete Institute (ACI):
ACI 117 - Specifications for Tolerances for Concrete Construction and Materials.
ACI 301 - Specifications for Structural Concrete.
ACI 303.1 – Specification for Cast-In-Place Architectural Concrete.
ACI 306.1 – Specification for Cold Weather Concreting.
ACI 308.1 – Specification for Curing Concrete.
ACI 315 - Details and Detailing of Concrete Reinforcement.
ACI 318 - Building Code Requirements for Structural Concrete and Commentary.

ASTM International (ASTM):
ASTM A615 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
ASTM A704 – Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement.
ASTM A706 – Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
ASTM A996 – Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.
ASTM C156 – Standard Test Method for Water Loss (From a Mortar Specimen) Through Liquid Membrane-Forming Curing Compounds for Concrete.
ASTM E164 – Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
ASTM E1745 – Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.

DEFINITIONS

Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
W/C Ratio: The ratio by weight of water to cementitious materials.
Cured Concrete: The concrete strength at 28 days.
Dry Concrete: The measure of concrete at 80% relative humidity at 40% of the concrete slab-on-grade depth.
Self-Consolidating Concrete (SCC): a highly workable concrete that can flow through densely reinforced or complex structural elements under its own weight and adequately fill voids without segregation or excessive bleeding without the need for vibration.
Passing Ability: The ability of SCC to flow through openings such as the spaces between reinforcing bars without segregation or aggregate blocking.
J-Ring Test: Test used to determine the passing ability of SCC, or the degree to which the passage of concrete through the bars of the J-Ring apparatus is restricted.


Slump Flow: Test method used to measure the unconfined flow and stability of SCC using a slump cone (upright or inverted).

Slump Flow Spread: The numerical value in inches of flow and stability of SCC using a slump cone (upright or inverted).

Slump Flow Spread: The numerical value in inches of flow determined as the average diameter of the circular deposit of SCC at the conclusion of the slump flow test.

$T_{50}$ Value: Time (in seconds) the edge of the concrete mass takes to reach 50 cm (20 inches) diameter from the time the mold is first raised in the slump flow test.

Stability: The ability of a concrete mixture to resist segregation of the paste from the aggregates.

Static Segregation (Segregation Factor): Segregation of the mortar from the coarse aggregate that occurs after placement while the concrete is still in the plastic state.


**PREINSTALLATION MEETINGS**

Prior to submitting design mixtures, contractor shall hold a meeting to review detailed requirements for preparing final concrete design mixes and to establish procedures for placing, finishing, curing, and protecting concrete to meet required quality under anticipated conditions. Representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

- Contractor's superintendent.
- Architect
- DFD Construction Representative
- Testing Laboratory responsible for field quality control.
- Ready-mix concrete supplier.
- Concrete Subcontractor.
- Special concrete finish Subcontractor.

Minutes of the meeting shall be recorded, typed, reproduced and distributed by Contractor to all parties concerned within five working days of meeting. Minutes shall include a statement by admixture manufacturer(s) indicating that proposed mix design and placing can produce concrete quality required by this Section.

Contractor shall notify Architect at least 10 days prior to scheduled date of meeting.

**SUBMITTALS**

Product Data: For each type of product.

Sustainable Design Submittals: Comply with additional LEED submittal requirements specified in Section 01 81 13 and the following:

Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
Product Data for Credit IEQ 4.3: For [liquid floor treatments] [and] [curing and sealing compounds], documentation including printed statement of VOC content.

Design Mixtures for Credit ID 1.1: For each concrete mixture containing fly ash as a replacement for portland cement or other portland cement replacements, and for equivalent concrete mixtures that do not contain portland cement replacements.

Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

Indicate amounts of mixing water to be withheld for later addition at Project site.

Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

Concrete In-Situ Relative Humidity and pH Testing.

Report all test results in chart form listing test dates and time, depth of test holes, in-situ temperature and in-situ relative humidity, as well as pH levels of concrete slab surface to determine if the concrete is too dry to receive applied floor finishes.

List test hole locations on chart and show same on 8 ½ x 11” site map (when such a map is available to testing agency.)

Prepare a report of findings for the relative humidity and pH and distribution to Architect and General Prime Contractor.

Welding certificates.

Material Certificates: For each of the following, signed by manufacturers:

- Cementitious materials.
- Admixtures.
- Form materials and form-release agents.
- Steel reinforcement and accessories.
- Fiber reinforcement.
- Waterstops.
- Curing compounds.
- Bonding agents.
- Adhesives.
- Vapor retarders.
- Semirigid joint filler.
- Joint-filler strips.
- Repair materials.

Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

- Aggregates

Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, detailing fabrication, assembly, and support of formwork.
Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.

Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

Field quality-control reports.

Minutes of preinstallation conference.

**QUALITY ASSURANCE**

**Installer Qualifications:** A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

**Manufacturer Qualifications:** A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

**Testing Agency Qualifications:** An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.

**Welding Qualifications:** Qualify procedures and personnel according to AWS D1.4/D 1.4M.

**Concrete In-Situ Relative Humidity and pH:**

ASTM F2170-11 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs using In-Situ Probes.

ASTM F710-11 – Standard Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.

Digital “Reader” and calibrated relative humidity sensors

Factory-calibrated “Smart Sensors” using Touch-n-Sense TM technology or similar testing equipment.

National Insitute of Standards for Testing (NIST) – traceable factory calibration.

Wide range pH paper, and distilled or de-ionized water.

**DELIVERY, STORAGE, AND HANDLING**

**Steel Reinforcement:** Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

**Waterstops:** Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.
FIELD CONDITIONS
Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.

Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

Hot-Weather Placement: Comply with ACI 301 and as follows:

Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS
FORM-FACING MATERIALS
Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces.

Furnish in largest practicable sizes to minimize number of joints.

Plywood, metal, or other approved panel materials.

Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

High-density overlay, Class 1 or better.

Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.

Structural 1, B-B or better; mill oiled and edge sealed.

B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.

Overlaid Finnish birch plywood.

Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.
Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.


Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

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

Formulate form-release agent with rust inhibitor for steel form-facing materials.

Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.

Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.

Furnish ties with integral water-barrier plates to walls indicated to receive damp proofing or waterproofing.

STEEL REINFORCEMENT

Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than [25] [60] <Insert number> percent.

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

Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.

Galvanized Reinforcing Bars: [ASTM A 615/A 615M, Grade 60] [ASTM A 706/A 706M], deformed bars, ASTM A 767/A 767M, [Class I] [Class II] zinc coated after fabrication and bending.

Epoxy-Coated Reinforcing Bars: [ASTM A 615/A 615M, Grade 60] [ASTM A 706/A 706M], deformed bars, [ASTM A 775/A 775M] [or] [ASTM A 934/A 934M], epoxy coated, with less than 2 percent damaged coating in each 12-inch bar length.

Stainless-Steel Reinforcing Bars: ASTM A 955/A 955M, Grade 60, [Type 304] [Type 316L], deformed.

Steel Bar Mats: ASTM A 184/A 184M, fabricated from [ASTM A 615/A 615M, Grade 60] [ASTM A 706/A 706M], deformed bars, assembled with clips.

Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.


REINFORCEMENT ACCESSORIES

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

For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
CONCRETE MATERIALS

Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

Cementitious Materials:
- Portland Cement: ASTM C 150/C 150M, [Type I] [Type II] [Type I/II] [Type III] [Type V], [gray] [white].
- Fly Ash: ASTM C 618, [Class F] [Class F or C].
- Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.
- Blended Hydraulic Cement: ASTM C 595/C 595M, [Type IS, portland blast-furnace slag] [Type IP, portland-pozzolan] [Type IL, portland-limestone] [Type IT, ternary blended] cement.
- Silica Fume: ASTM C 1240, amorphous silica.

Normal-Weight Aggregates: ASTM C 33/C 33M, [Class 3S] [Class 3M] [Class 1N] <Insert class> coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.

- Maximum Coarse-Aggregate Size: [1-1/2 inches] [1 inch] [3/4 inch] <Insert dimension> nominal.
- Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

ADMIXTURES

Admixtures to be used in the concrete mixture shall be submitted for approval as part of the mixture design. No other admixtures will be allowed except those listed without the Architect's approval.

- Air-Entraining Admixture: ASTM C 260/C 260M.

Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

- Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
- Retarding Admixture: ASTM C 494/C 494M, Type B.
- Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
- Viscosity-Modifying Admixture: ASTM C 494/C 494M, Type S.
- High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
- High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
- Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C.

Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

Color Pigment: ASTM C 979/C 979M, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable,[ free of carbon black,] nonfading, and resistant to lime and other alkalis.

Color: [As indicated by manufacturer's designation] [Match Architect's sample] [As selected by Architect from manufacturer's full range].

Water: ASTM C 94/C 94M[ and potable].

FIBER REINFORCEMENT

(AE Note: Fiber reinforcement to be reviewed and approved by DFD prior to use)

Carbon-Steel Fiber: ASTM A 820/A 820M, Type 1, cold-drawn wire, deformed, minimum of [1.5 inches] [2 inches] [2.4 inches] <Insert dimension> long, and aspect ratio of [35 to 40] [45 to 50] [60 to 65] <Insert ratio>.

Carbon-Steel Fiber: ASTM A 820/A 820M, Type 2, cut sheet, deformed, minimum of [1.5 inches] [2 inches] [2.4 inches] <Insert dimension> long, and aspect ratio of [35 to 40] [45 to 50] [60 to 65] <Insert ratio>.

Synthetic Micro-Fiber: Monofilament polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, [1/2 to 1-1/2 inches] [1 to 2-1/4 inches] <Insert dimensions> long.

Synthetic Micro-Fiber: Fibrillated polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, [1/2 to 1-1/2 inches] [1 to 2-1/4 inches] <Insert dimensions> long.

Synthetic Macro-Fiber: Polyolefin macro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, [1 to 2-1/4 inches] <Insert dimensions> long.

WATERSTOPS

(AE Note: Bulb type waterstops are to be avoided, unless application requires chemically resistant waterstop, such as agricultural holding tanks or similar applications where hydrophilic materials are not allowed)

Flexible Rubber Waterstops: CE CRD-C 513,[ with factory-installed metal eyelets,] for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

Profile: [Flat dumbbell with center bulb] [Flat dumbbell without center bulb] [Ribbed with center bulb] [Ribbed without center bulb] [As indicated] <Insert profile>.

Dimensions: [4 inches by 3/16 inch thick] [6 inches by 3/8 inch thick] [9 inches by 3/8 inch thick] <Insert dimensions>; nontapered.

Chemically Resistant Flexible Waterstops: Thermoplastic elastomer rubber waterstops[ with factory-installed metal eyelets], for embedding in concrete to prevent passage of fluids through joints; resistant to oils, solvents, and chemicals. Factory fabricate corners, intersections, and directional changes.

Profile: [Flat dumbbell with center bulb] [Flat dumbbell without center bulb] [Ribbed with center bulb] [Ribbed without center bulb] [As indicated] <Insert profile>.
Dimensions: [4 inches by 3/16 inch thick] [6 inches by 3/16 inch thick] [6 inches by 3/8 inch thick] [9 inches by 3/16 inch thick] [9 inches by 3/8 inch thick] <Insert dimensions>; nontapered.

Flexible PVC Waterstops: CE CRD-C 572, [with factory-installed metal eyelets,] for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

Profile: [Flat dumbbell with center bulb] [Flat dumbbell without center bulb] [Ribbed with center bulb] [Ribbed without center bulb] [As indicated] <Insert profile>.

Dimensions: [4 inches by 3/16 inch thick] [6 inches by 3/8 inch thick] [9 inches by 3/8 inch thick] <Insert dimensions>; nontapered.

Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch.

Self-Expanding Rubber Strip Waterstops: Manufactured rectangular or trapezoidal strip, bentonite-free hydrophilic polymer-modified chloroprene rubber, for adhesive bonding to concrete, 3/8 by 3/4 inch.

VAPOR RETARDERS
Sheet Vapor Retarder: ASTM E 1745, Class A[, except with maximum water-vapor permeance of <Insert rating>]. Include manufacturer's recommended adhesive or pressure-sensitive tape.

Sheet Vapor Retarder: ASTM E 1745, Class B[, except with maximum water-vapor permeance of <Insert rating>]. Include manufacturer's recommended adhesive or pressure-sensitive tape.

Sheet Vapor Retarder: ASTM E 1745, Class C[, except with maximum water-vapor permeance of <Insert rating>]. Include manufacturer's recommended adhesive or pressure-sensitive joint tape.

Sheet Vapor Retarder: Polyethylene sheet, ASTM D 4397, not less than 10 mils thick.

Bituminous Vapor Retarder: 110-mil- thick, semiflexible, seven-ply sheet membrane consisting of reinforced core and carrier sheet with fortified asphalt layers, protective weathercoating, and removable plastic release liner. Furnish manufacturer's accessories, including bonding asphalt, pointing mastics, and self-adhering joint tape.

Water-Vapor Permeance: 0.0011 grains/h x sq. ft. x inches Hg; ASTM E 154.
Tensile Strength: 140 lbf/inch; ASTM E 154.
Puncture Resistance: 90 lbf; ASTM E 154.

MOISTURE METER

FLOOR AND SLAB TREATMENTS
Slip-Resistive Emery Aggregate Finish: Factory-graded, packaged, rustproof, non-glaizing, abrasive, crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials with 100 percent passing [3/8-inch] [No. 4] [No. 8 ] <Insert size or gradation> sieve.

Emery Dry-Shake Floor Hardener: [Pigmented] [Unpigmented], factory-packaged, dry combination of portland cement, graded emery aggregate, and plasticizing admixture; with emery aggregate consisting of no less than 60 percent of total aggregate content.

Color: [As indicated by manufacturer's designation] [Match Architect's sample] [As selected by Architect from manufacturer's full range].
Metallic Dry-Shake Floor Hardener: [Pigmented] [Unpigmented], factory-packaged, dry combination of portland cement, graded metallic aggregate, rust inhibitors, and plasticizing admixture; with metallic aggregate consisting of no less than 65 percent of total aggregate content.

Color: [As indicated by manufacturer's designation] [Match Architect's sample] [As selected by Architect from manufacturer's full range].

Unpigmented Mineral Dry-Shake Floor Hardener: Factory-packaged dry combination of portland cement, graded quartz aggregate, and plasticizing admixture.

Pigmented Mineral Dry-Shake Floor Hardener: Factory-packaged, dry combination of portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.

Color: [As indicated by manufacturer's designation] [Match Architect's sample] [As selected by Architect from manufacturer's full range].

LIQUID FLOOR TREATMENTS
Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.

CURING MATERIALS
Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

Water: Potable.

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

Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating, [certified by curing compound manufacturer to not interfere with bonding of floor covering].

Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18 to 25 percent solids, nondissipating, [certified by curing compound manufacturer to not interfere with bonding of floor covering].

Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

RELATED MATERIALS
Expansion- and Isolation-Joint-Filler Strips: [ASTM D 1751, asphalt-saturated cellulosic fiber] [or] [ASTM D 1752, cork or self-expanding cork].

Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, [epoxy resin with a Type A shore durometer hardness of 80] [aromatic polyurea with a Type A shore durometer hardness range of 90 to 95] according to ASTM D 2240.

Bonding Agent: ASTM C 1059/C 1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
Reglets: Fabricate reglets of not less than 0.022-inch-thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

REPAIR MATERIALS
Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

- Cement Binder: ASTM C 150/C 150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
- Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
- Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
- Compressive Strength: Not less than [4100 psi] <Insert strength> at 28 days when tested according to ASTM C 109/C 109M.

Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.

- Cement Binder: ASTM C 150/C 150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
- Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
- Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
- Compressive Strength: Not less than [5000 psi] <Insert strength> at 28 days when tested according to ASTM C 109/C 109M.

CONCRETE MIXTURES, GENERAL
Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

- Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

Cementitious Materials:[Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.][Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:]

- Fly Ash: 25 percent.
- Combined Fly Ash and Pozzolan: 25 percent.
- Slag Cement: 50 percent.
Combined Fly Ash or Pozzolan and Slag Cement: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.

Silica Fume: 10 percent.

Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

Combined Fly Ash or Pozzolans, Slag Cement, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

Limit water-soluble, chloride-ion content in hardened concrete to \( [0.06] [0.15] [0.30] [1.00] <\text{Insert number}> \) percent by weight of cement.

Admixtures: Use admixtures according to manufacturer's written instructions.

- Use [water-reducing] [high-range water-reducing] [or] [plasticizing] admixture in concrete, as required, for placement and workability.
- Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
- Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.
- Use corrosion-inhibiting admixture in concrete mixtures where indicated.

Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

CONCRETE MIXTURE SCHEDULE

(\textit{AE Note: Below is a template schedule of mixes. AE is responsible for editing for specific design requirements encountered on project.})

<table>
<thead>
<tr>
<th>Class</th>
<th>Type of Construction</th>
<th>Slump Before</th>
<th>Strength</th>
<th>Max.</th>
<th>Water</th>
<th>Air</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Min. Comp.</td>
<td>@ 28 Days</td>
<td>Agg.</td>
<td>Cement</td>
<td>Entrainment</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>(PSI)</td>
<td>(in. +/- 1 in.)</td>
<td>Size (in.)</td>
<td>Ratio</td>
<td>% +/- 1/2%</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Footings</td>
<td>3000</td>
<td>5</td>
<td>1.0</td>
<td>0.59</td>
<td>4.5</td>
<td>(1)</td>
</tr>
<tr>
<td>1a</td>
<td>Drilled piers</td>
<td>3000</td>
<td>4</td>
<td>1.0</td>
<td>0.59</td>
<td>4.5</td>
<td>(1) (4)</td>
</tr>
<tr>
<td></td>
<td>placed by tremie</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>Interior slab-on-grade</td>
<td>3500</td>
<td>3</td>
<td>0.75</td>
<td>0.68</td>
<td>none</td>
<td>(2)</td>
</tr>
<tr>
<td>2a</td>
<td>Exterior slab-on-grade</td>
<td>4500</td>
<td>3</td>
<td>0.75</td>
<td>0.44</td>
<td>6.0</td>
<td>(2)(4)</td>
</tr>
<tr>
<td>2b</td>
<td>Exterior</td>
<td>4500</td>
<td>3</td>
<td>0.75</td>
<td>0.44</td>
<td>6.0</td>
<td>(2)(4)(6)</td>
</tr>
</tbody>
</table>

DFD Project No.
0330000 - 14
<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Elevated slabs, beams and stairs</td>
<td>4000</td>
<td>4</td>
<td>0.75</td>
<td>0.57</td>
</tr>
<tr>
<td>3a</td>
<td>Elevated slabs, beams and stairs</td>
<td>5000</td>
<td>4</td>
<td>0.75</td>
<td>0.48</td>
</tr>
<tr>
<td>4</td>
<td>Walls and piers</td>
<td>4000</td>
<td>4</td>
<td>0.75</td>
<td>0.57</td>
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<tr>
<td>4a</td>
<td>Exposed walls</td>
<td>4000</td>
<td>3</td>
<td>0.75</td>
<td>0.48</td>
</tr>
<tr>
<td>5</td>
<td>Columns</td>
<td>4000</td>
<td>4</td>
<td>0.75</td>
<td>0.57</td>
</tr>
<tr>
<td>5a</td>
<td>Columns</td>
<td>5000</td>
<td>4</td>
<td>0.75</td>
<td>0.48</td>
</tr>
<tr>
<td>5b</td>
<td>Exposed columns</td>
<td>4000</td>
<td>4</td>
<td>0.75</td>
<td>0.48</td>
</tr>
<tr>
<td>5c</td>
<td>Exposed columns</td>
<td>5000</td>
<td>4</td>
<td>0.75</td>
<td>0.40</td>
</tr>
<tr>
<td>6</td>
<td>Metal deck topping</td>
<td>4000</td>
<td>4</td>
<td>0.75</td>
<td>0.57</td>
</tr>
<tr>
<td>7</td>
<td>Precast topping</td>
<td>4000</td>
<td>3</td>
<td>0.75</td>
<td>0.57</td>
</tr>
<tr>
<td>8</td>
<td>Metal pan stairs</td>
<td>4000</td>
<td>3</td>
<td>0.375</td>
<td>0.57</td>
</tr>
<tr>
<td>9</td>
<td>Miscellaneous non-scheduled concrete</td>
<td>3000</td>
<td>5</td>
<td>0.75</td>
<td>0.59</td>
</tr>
<tr>
<td>10</td>
<td>Utility Concrete</td>
<td>4500</td>
<td>3</td>
<td>0.75</td>
<td>0.48</td>
</tr>
<tr>
<td>10a</td>
<td>Utility Concrete</td>
<td>4500</td>
<td>See SCC requirements below</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(AE Note: Discuss the type of Utility concrete to be used for project with DFD as SCC concrete is typically only used on select projects.)

Notes:

1. Use a maximum of 50% replacement of portland cement with ground granulated blast-furnace slag and fly ash at a 1:1 ratio, up to 350 pounds per cubic yard. If fly ash is used alone, limit the maximum replacement to 25%.

2. Use a maximum of 30% replacement of portland cement with ground granulated blast-furnace slag and fly ash at a 1:1 ratio, up to 350 pounds per cubic yard, with a maximum 25% fly ash. If fly ash is used alone, limit the maximum replacement to 25%.

3. Use High-Range, Water-Reducing Admixture in mixture.

4. High-Range, Water-Reducing Admixture may be used in mixture.

5. Maximum equilibrium dry weight of lightweight aggregate mix: 115 pounds per cubic foot, as determined by section 9.5 of ASTM C 567.

(7) For SCC:
Water/Cementitious ratio shall be between 0.30 – 0.38 and shall not exceed 0.38 by weight.

Supplementary Cementitious Materials (SCM) shall not exceed the following percentages:
- Fly ash or other pozzolans – 25
- Slag Cement – 50
- Silica Fume – 10
- Combination of fly ash or other pozzolans, slag cement and silica fume – 50
- Combination of fly ash or other pozzolans and silica fume – 35
- Fly ash shall never constitute more than 25%

Slump Flow: The design slump flow shall be established after consideration of the project requirements, but will typically be in the range of 24-30 inches. The slump flow used on the project shall be the design slump flow plus/minus 2 inches.

Visual Stability Index (VSI): VSI rating shall not exceed 1.

J-Ring Flow: Difference between slump flow and J-Ring flow (as measured by ASTM C1621/C1621M) shall not be more than 4 inches.

Stability: The stability of the concrete shall be determined in the laboratory prior to approval of the SCC mixture using test method ASTM C1610/C1610M. All mixtures shall have a maximum static segregation (segregation factor) of 15%.

Maximum Nominal Size of Coarse Aggregate: Not larger than ¾ of the minimum clear distance between reinforcing bars or between bars and forms, whichever is the least.

Furnish to the Architect a mix proportion for the SCC to be used: proportion the mix according to specific criteria (compressive strength, air content, slump flow, T50, VSI, J-Ring value, segregation factor; use the same components in the trial batches as that to be used in the project, including coarse and fine aggregates, water, source and type of cement, SCM and admixtures.

FABRICATING REINFORCEMENT

Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

CONCRETE MIXING

Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M [and ASTM C 1116/C 1116M], and furnish batch ticket information.

When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.

For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.

For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..

Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.
PART 3 - EXECUTION

FORMWORK INSTALLATION
Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

[Class A, 1/8 inch] <Insert dimension> for smooth-formed finished surfaces.

[Class B, 1/4 inch] [Class C, 1/2 inch] [Class D, 1 inch] <Insert dimension> for rough-formed finished surfaces.

Construct forms tight enough to prevent loss of concrete mortar.

Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

Install keyways, reglets, recesses, and the like, for easy removal.

Do not use rust-stained steel form-facing material.

Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible.

Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

[Chamfer] [Do not chamfer] exterior corners and edges of permanently exposed concrete.

Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work.

Determine sizes and locations from trades providing such items.

Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

EMBEDDED ITEM INSTALLATION
Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.

Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

Install dovetail anchor slots in concrete structures as indicated.

REMOVING AND REUSING FORMS
General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for \( \text{\textbf{[24] Insert number}} \) hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.

Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved \( \text{\textbf{[at least 70 percent of]}} \) its 28-day design compressive strength.

Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged forming material are not acceptable for exposed surfaces. Apply new form-release agent.

When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

SHORING AND RESHORING INSTALLATION
Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.

Do not remove shoring or reshoring until measurement of slab tolerances is complete.

In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.

Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

VAPOR-RETARDER INSTALLATION
Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.

Lap joints 6 inches and seal with manufacturer's recommended tape.

Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder according to manufacturer's written instructions.

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

Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.

Set wire ties with ends directed into concrete, not toward exposed concrete surfaces. Install welded-wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

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

Zinc-Coated Reinforcement: Repair cut and damaged zinc coatings with zinc repair material according to ASTM A 780/A 780M. Use galvanized-steel wire ties to fasten zinc-coated steel reinforcement.

JOINTS
General: Construct joints true to line with faces perpendicular to surface plane of concrete.

Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

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.

Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.

Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.

Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.

Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-Third of concrete thickness as follows:

Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes.

Eliminate groover tool marks on concrete surfaces.

Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

- Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
- Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
- Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

WATERSTOP INSTALLATION
Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.

Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

CONCRETE PLACEMENT
Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.

- Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

- Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is 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.

Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.

- Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

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.

- 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.
- Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.

- Maintain reinforcement in position on chairs during concrete placement.
Screed slab surfaces with a straightedge and strike off to correct elevations.

Slope surfaces uniformly to drains where required.

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.

FINISHING FORMED SURFACES

Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

Apply to concrete surfaces [not exposed to public view] <Insert locations>.

Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

Apply to concrete surfaces [exposed to public view,] [to receive a rubbed finish,] [or to be covered with a coating or covering material applied directly to concrete] <Insert locations>.

Rubbed Finish: Apply the following to smooth-formed-finished as-cast concrete where indicated:

Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix 1 part portland cement to 1-1/2 parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.

Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix 1 part portland cement and 1 part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

FINISHING FLOORS AND SLABS

General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in one direction.

Apply scratch finish to surfaces [indicated] [and] [to receive concrete floor toppings] [to receive mortar setting beds for bonded cementitious floor finishes] <Insert locations>.

Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
Apply float finish to surfaces [indicated] [to receive trowel finish] [and] [to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo] <Insert locations>.

Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

Apply a trowel finish to surfaces [indicated] [exposed to view] [or] [to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system] <Insert locations>.

Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:

- Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
- Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.
- Specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 15; for suspended slabs.
- Specified overall values of flatness, F(F) 45; and of levelness, F(L) 35; with minimum local values of flatness, F(F) 30; and of levelness, F(L) 24.

Finish and measure surface, so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.-long straightedge resting on two high spots and placed anywhere on the surface does not exceed [1/4 inch] [3/16 inch] [1/8 inch].

Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces [indicated] [where ceramic or quarry tile is to be installed by either thickset or thin set method]. While concrete is still plastic, slightly scarify surface with a fine broom.

Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

Slip-Resistive Finish: Before final floating, apply slip-resistive [aggregate] [aluminum granule] finish where indicated and to concrete stair treads, platforms, and ramps. Apply according to manufacturer's written instructions and as follows:

Uniformly spread [25 lb/100 sq. ft.] <Insert rate> of dampened slip-resistive [aggregate] [aluminum granules] over surface in one or two applications. Tamp aggregate flush with surface, but do not force below surface.

After broadcasting and tamping, apply float finish.

After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive [aggregate] [aluminum granules].

Dry-Shake Floor Hardener Finish: After initial floating, apply dry-shake floor hardener to surfaces according to manufacturer's written instructions and as follows:
Uniformly apply dry-shake floor hardener at a rate of [100 lb/100 sq. ft.] <Insert rate> unless greater amount is recommended by manufacturer.

Uniformly distribute approximately two-thirds of dry-shake floor hardener over surface by hand or with mechanical spreader, and embed by power floating. Follow power floating with a second dry-shake floor hardener application, uniformly distributing remainder of material, and embed by power floating.

After final floating, apply a trowel finish. Cure concrete with curing compound recommended by dry-shake floor hardener manufacturer and apply immediately after final finishing.

VAPOR RETARDER

QUANTIFICATION OF RELATIVE HUMIDITY AT 40% OF CONCRETE THICKNESS
Comply with the manufactures installation and equipment utilizing requirements.

The test site should be maintained at the same temperature and humidity conditions as those anticipated during normal occupancy. These temperature and humidity levels should be maintained for 48 hours prior and during test period. When a building is not under HVAC control, a recording hygrometer or data logger shall be in place recording conditions during the test period. A transcript of this information must be included with the test report.

The number of in-situ relative humidity test sites is determined by the square footage of the facility. The minimum number of tests to be placed is equal to 3 in the first 1,000 square feet, and 1 per each additional 1,000 square feet.

Determine the thickness of the concrete slab, typically from construction documents.

Utilizing a rotary-hammer drill, drill test holes to a depth equal to 40% of the concrete thickness, i.e., 2” deep for a 5” thick slab, or 1.6” deep for a 4” thick slab. Hole diameter shall not exceed outside diameter of the probe by more than 0.04”. Drilling operation must be dry.

Vacuum and brush all concrete dust from test hole.

Insert a relative humidity probe (sensor) to the full depth of test hole. Place cap over probe. If appropriate provide additional security to prevent cap removal using packing tape.

Permit test holes with probes to acclimate, or equilibrate for 72 hours prior to taking relative humidity readings.

Remove the cap, insert the cylindrical reading device, and obtain reading from the in-situ probe.

Read and record temperature and relative humidity in each test hole. These test results are used to determine if the slab-on-grade has experienced moisture depletion to the relative humidity level to assist in the proper adhesion of the moisture sensitive floor coverings.

QUANTIFYING pH LEVEL
At or near the relative humidity test site perform pH test.

Place several drops of water onto the concrete surface to form a puddle approximately 1” in diameter.

Allow the water to set for approximately 60 seconds

Dip the pH paper into the water and remove immediately, compare color to chart provided by paper supplier to determine pH reading
Record and report results. These test results are used to determine if the slab-on-grade has experienced moisture depletion to the relative humidity level to assist in the proper adhesion of the moisture sensitive floor coverings.

MISCELLANEOUS CONCRETE ITEM INSTALLATION

Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

Equipment Bases and Foundations:

- Coordinate sizes and locations of concrete bases with actual equipment provided.
- Construct concrete bases [4 inches] [6 inches] [8 inches] <Insert dimension> high unless otherwise indicated, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.
- Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
- For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
- Prior to pouring concrete, place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
- Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.

Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel finish concrete surfaces.

CONCRETE PROTECTING AND CURING

General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

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

Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.

Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

Cure concrete according to ACI 308.1, by one or a combination of the following methods:

- Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
  - Water.
  - Continuous water-fog spray.
Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.

Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.

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

Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.

Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat.

Maintain continuity of coating and repair damage during curing period.

LIQUID FLOOR TREATMENT APPLICATION
Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.

Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.

Do not apply to concrete that is less than [three] [seven] [14] [28] days' old.

Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.

Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions.

JOINT FILLING
Prepare, clean, and install joint filler according to manufacturer's written instructions.
Defer joint filling until concrete has aged at least [one] [six] month(s). Do not fill joints until construction traffic has permanently ceased.
Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.

Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

**CONCRETE SURFACE REPAIRS**

Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar matches surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.

Compact mortar in place and strike off slightly higher than surrounding surface.

Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

After concrete has cured at least 14 days, correct high areas by grinding.

Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.

Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar. Repair materials and installation not specified above may be used, subject to Architect's approval.

FIELD QUALITY CONTROL

Special Inspections: Owner will engage a [special inspector] [and] [qualified testing and inspecting agency] to perform field tests and inspections and prepare test reports.

Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

Inspections:

- Steel reinforcement placement.
- Steel reinforcement welding.
- Headed bolts and studs.
- Verification of use of required design mixture.
- Concrete placement, including conveying and depositing.
- Curing procedures and maintenance of curing temperature.
- Verification of concrete strength before removal of shores and forms from beams and slabs.

Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:

Test Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.

Test Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.

When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

Petrographic Analysis:

One test for each day’s pour. Perform additional tests when concrete consistency appears to change. Analysis shall include the following:

1. Water/Cement ratio and porosity distribution
2. Air content and distribution

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Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

For SCC; test slump flow in accordance with ASTM C1611. Cone can be used either upright or inverted. Same procedure shall be followed throughout project.

For SCC; tester shall record the Visual Stability Index (VSI)

Air Content: ASTM C 231/C 231M, pressure method, for normal-weight concrete; [ASTM C 173/C 173M, volumetric method, for structural lightweight concrete; ]one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.

Unit Weight: ASTM C 567/C 567M, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

Compression Test Specimens: ASTM C 31/C 31M.

Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.


Test one set of two field-cured specimens at [24 hrs, 7] days and one set of two specimens at [48 hrs, 7, 28] days.

A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

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

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

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

Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

Measure floor and slab flatness and levelness according to ASTM E 1155 within [24] [48] <Insert number> hours of finishing.

PROTECTION OF LIQUID FLOOR TREATMENTS
Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION 033000
SECTION 31 10 00
SITE CLEARING
BASED ON DFD MASTER SPECIFICATION DATED 02/17/2016

PART 1 - GENERAL

SCOPE

The work under this section shall consist of providing all work, materials, labor, equipment, and supervision necessary to clear and grub the site of existing vegetation as required in these specifications and on the drawings. Included are the following topics:

PART 1 - GENERAL
Scope
Related Work
Clearing Limits

PART 2 - MATERIALS
Not Used

PART 3 - EXECUTION
General
Cutting
Removal Methods
Grubbing

RELATED WORK

Applicable provisions of Division 1 govern work under this Section.

Related work specified elsewhere:
Section 30 05 00 – Common Work Results For All Exterior Improvements
Section 31 13 00 – Selective Tree and Shrub Removal and Transplanting
Section 31 13 16 - Selective Tree and Shrub Protection and Trimming
Section 31 20 00 – Earthmoving
Section 31 25 00 – Erosion Control

CLEARING LIMITS

Confine clearing and grubbing operations to the 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 Owner's Project Representative. Clearing and grubbing operations shall not extend past the property line or easement line without prior approval of the DFD Project Representative.

PART 2 - MATERIALS
Not Used

PART 3 - EXECUTION

GENERAL

Limits of clearing and grubbing shall be as shown on drawings. When selective pruning and removal is specified, limit work to only those plants or limbs shown on the drawings or detailed in the specifications.
Remove and dispose of trees, stumps, roots, brush, vegetation, debris, and other items that interfere with new construction as shown on the drawings.

To minimize erosion, limit heavy equipment travel only to areas that are necessary to complete clearing and grubbing operations.

Repair damaged erosion control features immediately.

**CUTTING**

Fell and prune trees in manner so as not to damage adjacent structures, site features or other plants not scheduled for removal.

If trees scheduled to remain are injured notify DFD Project Representative.

When pruning, limit removal only to those limbs shown on drawings or that which is necessary to complete other site work.

When pruning, make cuts near trunk, but beyond branch collar. If no branch collar is present, make a vertical cut near where the limb meets the trunk. Do not cut branch collar. Application of tree paint is not necessary for pruning trees as designated on the drawings unless otherwise noted.

Prevent the spread of oak wilt by treating all cut surfaces and abrasions sustained between April 1 and October 1 on healthy oak trees and saplings with a thorough application of tree paint immediately upon discovering a wound. Between these dates, also paint the cut surfaces of the stumps of all healthy oak trees and saplings immediately after cutting, whether remaining in place or grubbed.

Use sharp tools and make clean cuts.

**REMOVAL METHODS**

Unless the drawings specify otherwise, the Contractor owns all trees, brush and debris removed from the site. All cleared material shall be disposed of offsite unless otherwise specified on the drawings or agreed upon by the Owner and DFD Project Representative prior to any clearing and grubbing taking place.

Clearing and grubbing debris shall be disposed of at facilities designed to accept the material that is being disposed. Follow all local, state and federal regulations.

**GRUBBING**

Grubbing operations may be completed by removal of stump section or by grinding.

Remove stumps, logs, roots, other organic matter located within proposed building excavations completely.

Remove stumps, logs, roots, other organic matter located within proposed pavements and structures to the depth indicated:

- Walks: 24 inches below subgrade
- Roads and drives and parking areas: 36 inches below subgrade
- Concrete slabs: 24 inches below subgrade
- Lawn areas: 12 inches
- Footings and foundations for signs, lights, etc.: 18 inches below footing base

Depressions resulting from grubbing operations shall be backfilled in accordance with Section 31 20 00 – Earthwork.
PART 1 - GENERAL

SCOPE

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. All dewatering required for construction shall be included in the Contractor’s Bid. Included are the following topics:

PART 1 - GENERAL
Scope
Related Work
References
Submittals
Permits/Fees
Environmental Contaminants
Noise Pollution

PART 2 - MATERIALS
General

PART 3 - EXECUTION
General
Sump Dewatering
Well Installation
Operation
Removal/Abandonment

RELATED WORK

Applicable provisions of Division 1 govern work under this Section.
Section 02 05 00 – Common Work Results for Existing Conditions
Section 02 32 00 – Geo Technical Investigation
Section 30 05 00 – Common Work Results for All Exterior Work
Section 31 20 00 – Earthmoving
Section 31 25 00 – Erosion Control

REFERENCES

Chapter NR 141 – Groundwater Monitoring Well Requirements
Chapter NR 812 – Well Construction and Pump Installation

SUBMITTALS

When deep wells or well point systems are utilized, provide system design computations.
When permits are required for dewatering, provide copies of all permits.
Provide copies of the layout of all dewatering system components.
Provide copies of all well abandonment forms.
PERMITS/FEES
Pay for and obtain all permits/approval required by local, state and federal regulations.
Necessary permits/approval may include, but are not limited to WDNR high capacity well approval and erosion control permits.

When installing by jetting methods, the Contractor shall provide their own water source. Do not use hydrants as water source without permission from DFD Project Representative and/or local utility, as applicable. If permission to use hydrants has been allowed, the Contractor shall obtain and pay for any required hydrant use permits.

ENVIRONMENTAL CONTAMINANTS
Monitor dewatering system discharge regularly for signs of chemicals or other environmental contaminants.
If chemicals or environmental contaminants are observed, terminate dewatering system operation immediately and contact the DFD Project Representative.
Prevent dewatering system from introducing contaminants into the soil or groundwater.

NOISE POLLUTION
Provide mufflers, housing, berms and fencing as necessary to minimize noise pollution resulting from dewatering system operation.

PART 2 - MATERIALS
GENERAL
All deepwell and wellpoint dewatering equipment and well construction/abandonment materials shall meet the requirements of NR 812.

PART 3- EXECUTION
GENERAL
Comply with all local, state and federal regulations.
When deep wells or well point systems are utilized, prepare a system design. Design system to dewater site as necessary to complete construction, but minimize impact on local water table. Do not adversely impact neighboring private wells.
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.
Monitor water levels in wells adjacent to construction site. Adjust dewatering system configuration and operation as necessary if neighboring wells are adversely impacted.
Pump groundwater at lowest rate necessary to dewater site as required to accommodate other sitework.
SUMP DEWATERING

Install collection sump in the low point of the excavation(s).

Provide filter material, trash screens and other devices around pump or intake to avoid pumping of sediment.

WELL INSTALLATION

Install wells by rotary, driven or hydraulic jetting methods.

OPERATION

Provide personnel, equipment and power necessary to maintain and operate the dewatering system as required to complete construction at the site.

Do not discharge water into the sanitary sewer system.

REMOVAL/ABANDONMENT

Remove all dewatering system components immediately following use.

Abandon dewatering wells in accordance with NR 812.

Clean receiving storm sewer system, ground surface and surface waters of any sediment or debris deposits resulting from dewatering system operation.

END OF SECTION
PART 1 - GENERAL

SCOPE

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
Reference Documents
Submittals
Erosion Control Plan

PART 2 - MATERIALS
General
Geotextile Fabric
Temporary Ditch Barriers
Silt Fence
Erosion Mat
Staples
Riprap
Gabion Stone
Soil Stabilizers
Soil Tackifiers

PART 3 - EXECUTION
General
Grading and Earthwork
Drainage
Tracking Control
Maintenance

RELATED WORK

Applicable provisions of Division 1 govern work under this Section.

Related work specified elsewhere:
Section 02 41 13 – Demolition
Section 30 05 00 – Common Work Results For All Exterior Improvements
Section 31 20 00 – Earthmoving
Section 31 22 16.15 – Roadway Subgrade Preparation
Section 31 23 16.13 – Trenching
Section 31 23 16.16 -- Structural Excavation for Minor Structures
Section 31 23 19 – Dewatering
Section 32 92 20 – Native Seeding

Provide erosion control in accordance with the following references:

- Erosion Control Product Acceptability List (“PAL”), current version as published by the WisDOT.
- Construction Site Erosion & Sediment Control Technical Standards, current version as published by the Wisconsin Department of Natural Resources WDNR.
- Storm Water Post-Construction Technical Standards, current version as published by the WDNR.
Method of measurement and basis of payment sections in any referenced erosion control documents shall not apply to this contract.

**REFERENCE DOCUMENTS**

Wherever PAL appears in this specification, it shall mean the Wisconsin Department of Transportation, Erosion Control Product Acceptability List (PAL), current edition.

**SUBMITTALS**

Submit shop drawings for the following erosion control features:

**EROSION CONTROL PLAN**

The A/E has prepared an erosion control plan for the project. [The A/E will complete, apply for, and pay for a Water Resources Application for Project Permits (WRAPP) to obtain acceptance for land disturbing activities in excess of 1 acre from the WDNR.] The Contractor will provide the A/E 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.

Contractor shall comply with all the requirements of the erosion control plan, [and if applicable, the Construction Site Storm Water Runoff General Permit requirements as obtained from the WRAPP. Contractor shall be responsible for completing all construction site inspection reports for the duration of the project and the Notice of Termination form required by the WDNR].

Contractor shall provide all erosion control measures necessary as noted in the drawings and defined in the specifications to protect property and the environment. Apply and pay for erosion control or land disturbing permits as required by local municipalities and state agencies.

**PART 2 – MATERIALS**

**GENERAL**

Erosion mats, soil stabilizers, and tackifiers shall be listed on the Wisconsin Erosion Control Product Acceptability List (PAL) as published by the Wisconsin Department of Transportation.

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.

**GEOTEXTILE FABRIC**

Type FF geotextile fabric meeting the requirement of the PAL shall be used for inlet protection.

**TEMPORARY DITCH BARRIERS**

Rectangular bales of hay or straw, tightly bound with twine, not wire. Anchor stakes shall be “T” or “U” steel posts, or hardwood, 2-inches by 2-inches nominal. Rebar shall not be used for anchor bales.
Temporary ditch checks meeting the requirements of the PAL and installed per the manufacturer’s instructions may be used in lieu of bales. Temporary ditch checks may also be classified as silt logs, silt logs, or wattles. Temporary ditch checks shall be American Excelsior, Erosion Tech, Western Excelsior, or approved equal.

SILT FENCE

Fence fabric shall comply with the requirements of Standard Specifications for Highway and Structure 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.

EROSION MAT

A light duty, organic mat encased in a light weight photodegradable or biodegradable netting on both the bottom and top sides. Erosion mat shall comply with the requirements of Class I; Type A erosion mat as defined by Standard Specifications for Highway and Structure Construction and the PAL. Erosion mat shall be American Excelsior, Erosion Control Systems, North American Green, or approved equal.

For environmentally sensitive areas that have a high probability of trapping animals or for establishing natural areas with taller vegetation it is recommended that an urban mat is used. Erosion mat shall comply with the requirements of Class I; Urban Type B erosion mat as defined by Standard Specifications for Highway and Structure Construction and the PAL. Erosion mat shall be American Excelsior-Curlex Net-Free, Erosion Control Blanket-S32BD, Western Excelsior-Excel SS-2 All Natural, Ero-Guard EG-25 (NN), Erosion Tech ETRS2BN or approved equal.

STAPLES

Use staples conforming to Standard Specifications for Highway and Structure Construction 628.2.3 to anchor erosion mat. Staples shall be U-shaped of No. 11 gauge or heavier steel wire, or other approved materials, with a width of one to two inches, and a length of not less than 6 inches for firm soils and not less than 12 inches for loose soils.

Use biodegradable staples in accordance with manufacturer’s recommendations for anchoring urban erosion mats. Acceptable anchoring devices are listed in the PAL. Wood and metal staples are not allowed for use with urban erosion mats.

RIPRAPH

Riprap shall be the class specified in the plan and shall conform to Standard Specifications for Highway and Structure Construction 606.2. If a class is not specified in the plan, medium riprap shall be used.

GABION STONE

Gabion stone shall be washed stone or rock free of organic material, fines or other debris. Gabion stone shall meet the following gradation:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>% Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>7”</td>
<td>100</td>
</tr>
<tr>
<td>6”</td>
<td>90</td>
</tr>
<tr>
<td>4”</td>
<td>40</td>
</tr>
<tr>
<td>3”</td>
<td>10</td>
</tr>
</tbody>
</table>
SOIL STABILIZERS

Soil stabilizers shall be non-asphalt-based products of the type specified, and meeting the requirements of the PAL.

SOIL TACKIFIERS

Soil tackifiers shall be non-asphalt-based products of the type specified, and meeting the requirements of the PAL.

PART 3 - EXECUTION

GENERAL

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 DFD Project Representative of additional erosion control features that are provided, but not shown on the plan.

Contractor shall provide all erosion control measures necessary to protect property and the environment. Perform all work in accordance with manufacturer's instruction where these specifications do not specify a higher requirement.

GRADING AND EARTHWORK

Install all temporary or permanent erosion control measures prior to any onsite grading or land disturbances.

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.

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.

Do not stockpile soil within 25 feet of any roadway, parking lot, paved area, or drainage structure or channel. Provide temporary stabilization and control measures (seeding, mulching, covering, erosion matting, barrier fencing) for the protection of disturbed areas and soil piles which will remain unfinished for a period of more than 14 consecutive calendar days.

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.

DRAINAGE

Minimize water runoff and retain or detain on-site whenever possible so as to promote settling of solids and groundwater recharge.

Convey drainage to the nearest adequate public facility. Do not discharge water in a manner that will cause erosion or sedimentation of the site or receiving facility.

Protect storm sewer inlets and catch basins in accordance with the erosion control plan, if provided. If not specified, protect inlets with straw bale barriers, silt fencing, filter basket, gabion stone weepers, or other equivalent methods approved by the A/E which provide the necessary erosion protection.
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.

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.

**TRACKING CONTROL**

Provide each entrance to the site with a stone tracking pad. Tracking pad shall be constructed of Gabion Stone or Breaker Run.

If necessary, provide a crushed aggregate paved parking area.

If applicable, wash water shall be discharged to sedimentation basins, sedimentation vessels, or other such control areas. Untreated wash water shall not be discharged to storm sewers or surface water bodies.

**MAINTENANCE**

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.

Maintain records of all inspections and any remedial actions taken.

Maintain stockpile stabilization measures as necessary after rainfall events and heavy winds. Replace tarps, re-seed, and reapply mulch, tackifiers and stabilizers as necessary.

Remove sediment from stormwater and erosion control structures, basins and vessels as necessary.

Repair or replace damaged inlet protection.

Replace or supplement stone tracking pads with additional stone when they become ineffective.

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.

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**
SECION 33 11 00
WATER UTILITY DISTRIBUTION PIPING
BASED ON DFD MASTER SPECIFICATION DATED 09/01/2015

PART 1 - GENERAL

SCOPE

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. The limits of the work, including the responsible party for testing purposes, shall be clearly defined on the Drawings. Included are the following topics:

PART 1 - GENERAL
  Scope
  Related Work
  Reference Documents
  Reference Standards
  Submittals
  Continuity of Existing Water Distribution System
  Provisions for Future Work
  As-Built Drawings

PART 2 - MATERIALS
  Ductile Iron Watermain
  PVC Watermain
  HDPE Watermain
  Copper Water Service
  Ductile Iron Watermain Fittings
  Polyethylene Fittings
  Valves
  Brass Water Service Fittings
  Valve Boxes
  Hydrants
  Joint Restraints
  Polyethylene Encasement Bag
  Board Insulation
  Tracer Wire
  Locator Tape
  Chlorine
  Pipe Joint Lubricant

PART 3 - EXECUTION
  General
  Connection to Existing Mains/Tapping
  Bedding/Utility Cover
  Laying Watermain
  Tracer Wire
  Locator Tape
  Fittings, Valves and Hydrants
  Joint Restraint
  Copper Water Services and Brass Fittings
  Filling Watermain
  Pressure Testing
  Electric Continuity Testing
  Disinfection/Flushing
Bacteriological Sample

RELATED WORK

Applicable provisions of Division 1 govern work under this section.

Related work specified elsewhere:
Section 02 32 00 – Geo Technical Investigation
Section 22 11 00 – Facility Water Distribution
Section 22 13 00 – Facility Sanitary Sewerage
Section 22 14 00 – Facility Storm Drainage
Section 30 05 00 – Common Work Results for All Exterior Work
Section 31 23 16.13 – Trenching
Section 31 25 00 – Erosion Control

REFERENCE DOCUMENTS

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. Method of measurement and basis of payment sections in referenced documents shall not apply.

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.

REFERENCE STANDARDS

American Society for Testing and Materials (ASTM):

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B88</td>
<td>Standard Specifications for Seamless Copper Water Tube</td>
</tr>
<tr>
<td>F477</td>
<td>Standard Specifications for Elastomeric Gaskets for Joining Plastic Pipe</td>
</tr>
<tr>
<td>D3139</td>
<td>Standard Specifications for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals</td>
</tr>
<tr>
<td>D3350</td>
<td>Standard Specifications for Polyethylene Plastic Pipe and Fittings Materials</td>
</tr>
</tbody>
</table>

American Water Works Association (AWWA):

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C502</td>
<td>Dry Barrel Fire Hydrants</td>
</tr>
<tr>
<td>C504</td>
<td>Rubber-Seated Butterfly Valves</td>
</tr>
<tr>
<td>C509</td>
<td>Resilient-Seated Gate Valves for Water Supply Service</td>
</tr>
<tr>
<td>C515</td>
<td>Reduced Wall, Resilient Seated Gate Valves for Water Supply Service</td>
</tr>
<tr>
<td>C550</td>
<td>Protective Epoxy Interior Coatings for Valves and Hydrants</td>
</tr>
<tr>
<td>C800</td>
<td>Underground Service Line Valves and Fittings</td>
</tr>
<tr>
<td>C900</td>
<td>Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings for Water Distribution (4”-12”)</td>
</tr>
<tr>
<td>C905</td>
<td>Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings for Water Distribution (14”-48”)</td>
</tr>
<tr>
<td>C906</td>
<td>Polyethylene Pressure Pipe, and Fabricated Fittings for Water Distribution (4”-63&quot;)</td>
</tr>
<tr>
<td>C104/ANSI A21.4</td>
<td>Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water</td>
</tr>
<tr>
<td>C105/ANSI A21.5</td>
<td>Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems</td>
</tr>
<tr>
<td>C111/ANSI A21.11</td>
<td>Standard for Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings</td>
</tr>
<tr>
<td>C151/ANSI A21.51</td>
<td>Standard for Ductile Iron Pipe, Centrifugally Cast</td>
</tr>
<tr>
<td>C153/ANSI A21.53</td>
<td>Standard for Ductile Iron Compact Fittings</td>
</tr>
</tbody>
</table>
SUBMITTALS

Provide manufacturers product information (cut sheets) and O&M information for watermain materials including:
- Pipe
- Fittings
- Valves
- Hydrants
- Joint Restraint Materials

Provide copies of all pressure and electric continuity testing procedures and results for the project to the DFD Project Representative and the AE within 48 hours of completing the individual tests.

Provide reports that document safe sample collection procedures and results.

CONTINUITY OF EXISTING WATER DISTRIBUTION SYSTEM

Provide a construction schedule to DFD Project 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.

Do not interrupt existing water supply without approval from DFD Project Representative, municipal water utility, and local fire department.

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.

PROVISIONS FOR FUTURE WORK

Construct watermain system in a manner that will facilitate future extension or connection.

Unless otherwise shown on the drawings, 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 bell end with restrained plug.

AS-BUILT DRAWINGS

Show the actual locations of watermain and services, valves and hydrants on drawings and show changes to proposed watermain size, alignment, or grades. Show the actual locations, sizes and types of underground utilities and other features encountered during construction.

PART 2 - MATERIALS

DUCTILE IRON WATERMAIN

Ductile watermain shall be Class 52, ANSI/AWWA C151/A21.51 centrifugally cast, cement mortar lined meeting the requirements of ANSI/AWWA C104/A21.4.

Ductile iron watermain joints shall be rubber gasket push-on joint or mechanical joint meeting the requirements of ANSI/AWWA C111/A21.11.

Pipe shall be provided with conductive bonding straps to provide electrical continuity.
Pipe shall be manufactured in the United States.

**PVC WATERMAIN**

Polyvinyl chloride pipe shall have a dimension ratio (DR) of 18 or less and conform to the requirements of AWWA C900 (4”-12”) or AWWA C905 (14”-48”). Pipe shall meet applicable NSF standards for use in a potable water distribution system.

PVC watermain joints shall be rubber gasket push-on joint conforming to ASTM D 3139, using a gasket that conforms to ASTM F477.

**HDPE WATERMAIN**

**Polyethylene Resin**

Polyethylene resin used for manufacturing piping and fittings shall meet ASTM D1248 for Type III, Class C, Grade P34, Category 5, with a PPI recommended designation of PE3408 and a minimum cell classification of PE 345434C in accordance with ASTM D3350. The polyethylene compound shall be combined with carbon black to provide protection against degradation by ultraviolet light. Pipe shall be made from virgin material with no rework compound, except that obtained from the manufacturer’s own production of the same formulation.

**Polyethylene Piping**

High density polyethylene (HDPE) piping, shall meet the requirements of AWWA C906, current version. Pipe dimensions and workmanship shall be in accordance with ASTM F714 and ASTM D2122. Pipe shall be of diameter shown on the drawings, with dimension ratio (DR) of DR11, unless otherwise noted.

Pipe, fittings, and joints shall meet or exceed the following physical properties:

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>ASTM TEST METHOD</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density, gm/cc</td>
<td>D1505</td>
<td>0.955</td>
</tr>
<tr>
<td>Melt Index, gm/10 min</td>
<td>D1238-E</td>
<td>0.10</td>
</tr>
<tr>
<td>High Load Melt Index, gm/10 min</td>
<td>D1238-F</td>
<td>12.0</td>
</tr>
<tr>
<td>Tensile Strength @ Break, psi</td>
<td>D638</td>
<td>4,500</td>
</tr>
<tr>
<td>Tensile Strength @ Yield, psi</td>
<td>D638</td>
<td>&gt;3,200</td>
</tr>
<tr>
<td>Elongation, %</td>
<td>D638</td>
<td>&gt;800</td>
</tr>
<tr>
<td>Flexural Modulus, psi</td>
<td>D790</td>
<td>136,000</td>
</tr>
<tr>
<td>Environmental Stress Cracking Resistance F20’ Hours (100°C)</td>
<td>D1693 (Cond. C)</td>
<td>&gt;5,000</td>
</tr>
<tr>
<td>Brittleness Temperature, °F</td>
<td>D746</td>
<td>&lt;180</td>
</tr>
<tr>
<td>Melting Point, °F</td>
<td>D789</td>
<td>261</td>
</tr>
<tr>
<td>Vicat Softening Temperature, °F</td>
<td>D1525</td>
<td>255</td>
</tr>
<tr>
<td>Hardness, Shore D</td>
<td>D2240</td>
<td>66</td>
</tr>
<tr>
<td>Volume Resistivity, ohm-cm</td>
<td>D991</td>
<td>2.6 10(^{16})</td>
</tr>
<tr>
<td>Recommended Hydrostatic Design Stress:</td>
<td></td>
<td>1600 psi @ 73.4°F 800 psi @ 140°F</td>
</tr>
</tbody>
</table>

**Pipe Marking**

Each length of straight and special HDPE pipe and each HDPE fitting shall be plainly marked on the outside to identify the design pressure or class of pipe, proper location of the pipe or fitting in the pipeline, and the date of manufacture.

**COPPER WATER SERVICE**

**BELOW GROUND 2-1/2" AND SMALLER:**
Type K copper water tube, O (annealed) temper, ASTM B88; with cast copper pressure fittings, ANSI B16.18; wrought copper pressure fittings, ANSI B16.22; lead free (<.2%) solder, ASTM B32; flux, ASTM B813; or cast copper flared pressure fittings, ANSI B16.26.

**DUCTILE IRON WATERMAIN FITTINGS**

Fittings shall be ductile iron cement mortar lined mechanical joint compact style fittings meeting the requirements of ANSI/AWWA C153/A21.53.

Fittings shall be manufactured in the United States.

**POLYETHYLENE FITTINGS**

HDPE fittings manufactured in accordance with ASTM D2683 (socket fused) or ASTM D3261 (butt fused). Fittings shall be supplied by the HDPE piping manufacturer. Butt fusion outlets shall be made to the same dimensional characteristics and tolerances as the mating pipe. All fittings and custom fabrications shall be fully rated for the same internal pressure as the mating pipe. Pressure de-rated fabricated fittings are prohibited.

**VALVES**

**Resilient Wedge Gate Valve**

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.

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.

Valve stem shall be non-rising, low-zinc (zinc content not to exceed 6%) bronze. Valve stem shall have an integral thrust collar. Thrust collar bearings shall be designed to withstand maximum torque without distortion.

Stem seal shall be so designed that the O – ring above the stem collar can be replaced while the valve is under pressure and in the fully open position.

Valve shall be left opening and be provided with standard 2” square operating nut.

Valve shall be provided with mechanical joint connections. Mechanical joint ends shall conform to AWWA C509 and shall be furnished complete with all mechanical joint accessories including approved M.J. bolts and nuts. Glands shall be full body gray iron or ductile iron. Mechanical joint bells, glands and rubber gaskets shall be in accordance with AWWA C111.

Mueller, Kennedy, US Pipe, American Flow Control, Clow, or approved equal.

**Butterfly Valve**

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.

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.

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.

Valve seat shall be a single piece of elastomeric material that is not penetrated by the valve shaft.
Provide manual operator that is suitable for underground service and includes a standard 2” square operating nut.

Valve shall be provided with mechanical joint connections. Mechanical joint ends shall conform to AWWA C509 and shall be furnished complete with all mechanical joint accessories including approved M.J. bolts and nuts. Glands shall be full body gray iron or ductile iron. Mechanical joint bells, glands and rubber gaskets shall be in accordance with AWWA C111.

Mueller/Henry Pratt, Kennedy or approved equal.

**Tapping Valve**

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.

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.

Valve stem shall be non-rising bronze. Stem collar shall be provided with thrust bearings that are protected by upper and lower O-ring seals both above and below.

Valve shall be left opening and be provided with standard 2’’ square operating nut.

Valve shall be provided with flange connection on inlet side of valve and mechanical joint connections on outlet side of valve. Mechanical joint end shall conform to AWWA C509 and shall be furnished complete with all mechanical joint accessories including approved M.J. bolts and nuts. Glands shall be full body gray iron or ductile iron. Mechanical joint bells, glands and rubber gaskets shall be in accordance with AWWA C111.

Provide suitable companion tapping sleeve.

Mueller, US Pipe, American Flow Control, Clow, or approved equal.

**BRASS WATER SERVICE FITTINGS**

**Service Saddles**

Double strap, bronze service saddles meeting the requirements of AWWA C800. Service saddles shall be provided with nitrile O-ring gasket and AWWA Taper outlet.

Service saddles shall be properly sized to accommodate both the main and service lines.

Mueller BR 2B Series, Ferguson, Romac, or approved equal.

**Corporation Stops**

Corporation stops shall be brass, ball style. Inlets shall be AWWA Taper; outlet connection shall be compression having a positive indicator to avoid over-tightening.

Corporation stops shall be Mueller B-25008, A.Y. McDonald Mfg. Co., or approved equal.

**Curb Stops**

Curb stops shall be brass, with compression connections having a positive indicator to avoid over-tightening. Curb stops shall be provided with a quarter turn check.

Curb stops shall be Mueller B-25209, A.Y. McDonald Mfg. Co., or approved equal.
Unions shall be 3-piece brass, with compression connections having a positive indicator to avoid overtightening.

Unions shall be Mueller H-15403, A.Y. McDonald Mfg. Co., or approved equal.

U-Branch, Wyes, Etc.
U-branch, wye and other fittings shall be brass, with compression connections having a positive indicator to avoid over-tightening. Fittings shall be produced specifically for water supply applications.

Mueller, A.Y. McDonald Mfg. Co., or approved equal.

VALVE BOXES

Gate/Butterfly Valve Boxes
Valve boxes shall be screw type and shall consist of a base, middle section, top section with cover and intermediate extension sections. The top section shall be designed to thread onto the middle section so that the unit can be adjusted to a variable length. The top section shall be designed to receive a circular drop cover.

The valve box and component parts shall be cast iron in accordance with ASTM-A48 class 20, 30, 35, or approved equal.

Boxes shall be 5-1/4” with stay-put “WATER” cover.

The cast iron valve box and components shall be free from blowholes, cold shots, shrinkage defects, cracks or other injurious defects and shall have a normal smooth casting finish.

All cast iron valve boxes and components shall be thoroughly coated with asphaltic pitch varnish or approved equal.

Provide valve box extensions as necessary to accommodate depth of cover shown on drawings, or 6.5-foot minimum.

Valve boxes shall be Bingham & Taylor, East Jordan Iron Works, Tyler, or approved equal.

Curb Stop Boxes
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.

Provide valve box extensions as necessary to accommodate depth of cover shown on drawings, or 6.5-foot minimum.

Ford, Mueller, or approved equal.

HYDRANTS

Fire hydrants shall be dry-bury type meeting the requirements of AWWA C110, C111, and C502.

Hydrants shall be ductile iron, 250 psi rated working pressure.

Hydrants shall be traffic rated as specified in AWWA C502 except which is modified to permit a complete 360 degree rotation, or any increment thereof.
Hydrants shall be provided with the following features:

- 7’ bury (6.5’ cover over lead)
- 6” mechanical joint inlet
- 5 ¼” main valve opening
- One 4 ½” pumper nozzle with National Standard Threads
- Two 2 ½” hose nozzles with National Standard Threads
- Nozzle caps with chains
- Pentagon operating nut, open counter-clockwise, conforming to AWWA C502. Material of the operating nut shall be either hardened bronze or ductile iron.
- Painted red. Painting shall be in accordance with AWWA C502.

All extensions shall be made for insertion below the breakable flange. Extensions shall be made from the same material as that of the barrel. The hydrant must be designed to allow the use of barrel extension kits, which allow the raising of the hydrant to a new grade while retaining the “Safety Coupling and Breakable Flange” traffic collision feature at the new grade. Extension kits are to be in 6” increments, with the shortest being 6” long.

All nozzles shall be at the same elevation. Nozzle shall be capable of being threaded into the upper barrel and shall be mechanically locked in place. The distance from the base of the operating nut to the center of the pumper nozzle shall not be less than 7-1/8”. The distance between the ground and the center of the pumper nozzle shall not be less than 15 inches nominal dimension.

Hydrant shall be Waterous, Mueller, U.S. Pipe, or approved equal.

**JOINT RERAINTS**

**Retainer Glands for Ductile Iron Pipe**

Ductile iron wedge action retainer glands designed for use with ductile iron pipe.

Glands shall be constructed of. Restraint shall be provided by a minimum of three wedges that are tightened onto the exterior of the pipe using a threaded, torque limiting mechanism.

Glands shall be tested to provide restraint at 250 psi operating pressure.

EBAA Iron, Mueller AquaGrip, Romac Romagrip, or approved equal.

**Retainer Glands for PVC Pipe**

Wedge action retainer glands designed for use with PVC pipe.

Glands shall be constructed of ductile iron. Restraint shall be provided by a minimum of four wedges that are tightened onto the exterior of the pipe using a threaded, torque limiting mechanism.

Glands shall be tested to provide restraint at 200 psi operating pressure.

Retainer glands shall be MEGA-LUG by EBAA Iron, or approved equal.

EBAA Iron, Mueller AquaGrip, Romac Romagrip, or approved equal.

**POLYETHYLENE ENCASEMENT BAG**

8-mil polyethylene encasement bag meeting the requirements of ANSI/AWWA C105/A21.5, Class “C” black.
BOARD INSULATION

Insulation shall be rigid, closed-cell extruded polystyrene insulation suitable for buried installation. Individual boards shall have minimum dimensions of 8’x4’x2”.

Owens Corning, Dow Styrofoam, or approved equal.

TRACER WIRE

Tracer wire shall be #10 solid copper wire with insulated jacket. Tracer wire insulation color for non-metallic, potable water pipe shall be blue. Tracer wire insulation color for non-metallic, non-potable water pipe shall be purple.

LOCATOR TAPE

Tape shall be detectable metallic locator tape, specifically manufactured for marking utilities with a minimum width of 6 inches and detectable at a depth of 18”.

Tape for potable water shall be marked “WATER” and blue colored. Tape for non-potable water shall be marked “NON-POTABLE WATER” and purple colored.

CHLORINE

Chlorine disinfectant shall be calcium hypochlorite tablets or granules. Calcium hypochlorite product shall meet requirements for AWWA C651 – Standard for Disinfecting Water Mains - latest revision. Arch “HTH”, or approved equal.

PIPE JOINT LUBRICANT

Petroleum free pipe lubricant formulated for use with potable water systems. Product shall meet the requirements of ANSI/AWWA C111/A21.11 - latest revision.

PART 3 - EXECUTION

GENERAL

Complete exploratory excavations at utility crossings as shown on the drawings and as necessary to complete the work.

Maintain clearances between watermains and existing or proposed sewer lines as follows:
- 8’ horizontal separation (measured center to center) between watermains and existing or proposed sanitary or storm sewers.
- 12” vertical separation (measured from outsides of pipes) where watermains cross over sanitary or storm sewers.
- 18” vertical separation (measured from outsides of pipes) where watermains cross under sanitary or storm sewers.

Notify the A/E and DFD Project Representative of utility conflicts as soon as they are encountered.

Store and handle pipe in accordance with manufacturers’ recommendations. Keep pipes clean of soil, debris and animals.

Watermain construction shall be completed in a manner that minimizes interruptions to existing services.
CONNECTIONS TO EXISTING WATERMAINS/TAPPING

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.

Notify the DFD Project Representative if the proposed point of connection is located within 4’ of an existing joint.

Connections shall be made at existing pipe stubs, valves or other fittings.

At connections to existing mains, locate the new 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.

BEDDING /UTILITY COVER

Provide bedding and utility cover in accordance with the applicable requirements of Section 31 23 16.13 – Trenching.

Watermain and water service piping shall be provided with 6” of bedding material and 12” of utility cover material (both measured at the bell of the pipe).

Bedding and cover material for various types of pipe shall consist of the following:

- Ductile Iron Watermain: Bedding sand or crushed stone screenings.
- PVC Watermain: Crushed stone bedding.
- Copper Water Services: Bedding sand or crushed stone screenings.

LAYING WATERMAIN

Install pipe in accordance with the SSSWC and ASTM specifications that pertain to the specified type of pipe material and the installation situation.

Provide a minimum of 6.5’ of cover over watermain, unless otherwise shown on the drawings or directed by the DFD Project representative. For watermains with less than 6.5’ of cover, provide insulation as shown on the drawings, or as directed by the DFD Project Representative.

Lay watermain at uniform grades between deflection points shown on the drawings; do not install watermains with intermediate high points.

Unless otherwise shown or approved by the DFD Project Representative, lay pipe with bell end facing the direction of pipe laying.

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.

Prepare pipe bell and gasket in accordance with manufacturers requirements. Lubricate bell and/or pipe with AWWA/NSF approved lubricant.

Push pipe home in accordance with manufacturer’s recommendations regarding tools and methods.

Pipe joint deflection shall not exceed manufacturer’s requirements.
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.

Locate the geographic location of all dead end watermains and services and note actual location on As-Built Drawings.

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.

<table>
<thead>
<tr>
<th>Watermain Nominal Diameter (inches)</th>
<th>Dose Calcium Hypochlorite* (oz./length pipe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-6</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>7</td>
</tr>
</tbody>
</table>

* Granular/tablet calcium hypochlorite with 68% (weight) available chlorine

Table 33 11 00-1

When required, provide board insulation in the thickness and width shown on the drawings. Unless otherwise shown, insulation shall be provided at a minimum thickness of 2 inches.

Install insulation on compacted initial cover material 6 inches above the top of pipe. Stagger joints when placing multiple layers of insulation.

Provide insulation with a minimum of 1 foot of utility cover material. Place backfill material in manner that does not damage insulation; replace damaged insulation.

TRACER WIRE

Provide tracer wire for buried non-metallic water piping. Tracer wire shall be installed directly above the top of pipe and within six inches of the pipe.

Splices in tracer wire shall be made with split-bolt or compression-type connectors.

Access points are required every 400 feet. At access points the tracer wire shall be brought to grade in valve boxes, utility structures or other covered access devices.

LOCATOR TAPE

Install locator tape directly above new non-metallic sanitary sewer pipe approximately 15 inches below finished grade. Bring tape to surface and terminate in valve box or other structure.

FITTINGS, VALVES AND HYDRANTS

Install fittings, valves and hydrants at locations shown on the drawings.

Unless otherwise shown, provide restrained mechanical joint connections. Install materials in accordance with manufacturer’s recommendations.

Maintain electrical continuity through all fittings, valves and hydrants. Provide and install suitable jumper cables for epoxy coated valves.
Place hydrants and valves on 4”x8”x16” solid concrete masonry units set on compacted soil.

Install joint restraints in accordance with the requirements of this section.

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.

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 re-set.

Mark all valve boxes with a steel “U” fence post to protect them from damage.

Install hydrants at elevation shown on drawings or as required to provide a minimum of 6.5’ cover over the hydrant lead.

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.

Install hydrant plumb and level, backfilling all sides evenly.

Cover all new hydrants with a plastic garbage bag or similar cover until the main has been filled and placed in service.

**JOINT RESTRAINT**

Unless otherwise noted, all fittings, valves and hydrants shall be installed with restrained joints. Joint restraints shall be used on the adjacent full length (or more lengths as shown on the drawings) of pipe on all sides of fittings. Additionally, branch runs of pipe shall be installed with restrained joints beginning at the fitting at the main to the first valve.

Hydrant leads shall be provided with restrained joints beginning at the fitting at the main to the hydrant.

Joint restraint shall be provided using retainer glands.

Install all joint restraint products in accordance with manufacturer’s recommendations and drawings.

**COPPER WATER SERVICES AND BRASS FITTINGS**

Connect copper water service piping to watermain, wellhouse, or other supply as shown on the drawings.

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.

Service saddles shall installed on services where the corporation stop is 1 ½” nominal diameter or greater.

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.

Install curb stops as shown on the drawings. If specific curb stop location is not shown on the drawings, consult with DFD Project Representative to determine acceptable location prior to installing.

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.
Install curb stop box plumb and level and backfill all side simultaneously. 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.

Install copper water service as shown on the drawings. Prepare copper pipe joints in accordance with pipe and fitting manufacturer recommendations. Cut pipe squarely, remove burs and round ends as necessary.

Install fittings in accordance with manufacturer’s recommendations. Torque compression connections to recommended tightness; do not over-tighten compression joints.

Provide dead-end copper water services with compression connectors fitted with plugs. Do not tap or crimp the ends of copper water services shut.

Locate the geographic location of all dead end services and curb stop boxes and note actual location on As-Built Drawings.

FILLING WATERMAIN

Fill watermain after main has been installed and completely backfilled.

Fill main slowly to limit entrapped air and evenly distribute calcium hypochlorite. Open all hydrants completely to allow air to escape and monitor filling.

Once main is full, allow a minimum of 48 hours of time for disinfection to occur before flushing.

PRESSURE TESTING

Pressure test all watermain and copper water services.

Provide all valves, fittings, joint restraints, hoses, compressors, water and power supply as necessary to complete pressure testing. Utilize testing apparatus that is fabricated specifically for testing watermains. Calibrate pressure gauges as necessary.

Flush main as necessary to remove air prior to testing. Comply with the requirements of this section with respect to flushing.

For longer installations or installations consisting of watermain and copper water service, the Contractor may elect to pressure test the system in short segments.

All pressure testing shall be conducted in the presence of the DFD Project Representative. Provide minimum of 48 hours advanced notice of testing.

Conduct a combined pressure/leakage test for 1 hour at a pressure equal to 150% of system normal operating pressure (as measured at the lowest point in the system), or a minimum pressure of 150 psig.

When conducting test, pressure test equipment shall be set-up as close to the highest point in the line as possible.

Make-up water for the test shall be clean potable water supplemented with ½ oz of dry calcium hypochlorite per 35 gallons of water.

Leakage for test shall not exceed gallons per hour as allowed by the attached formula:

\[ G = \frac{(ND\sqrt{P})}{7400} \]
Where:  
G = Allowable leakage (gallons per hour of test)  
N = Number of joints under test  
D = Nominal diameter of main (inches)  
P = Average pressure during test (psig)  

Allowable leakage for high density polyethylene pipe shall be zero.

Record and document pressure test by recording the following information:

- Date of test  
- Section tested  
- Diameter and length of main under test  
- Number of fittings, valves hydrants, etc.  
- Results of test including test length, pressure, actual water loss  
- Calculation of allowable leakage  
- If a failed test, describe actions taken to eliminate leaks and results of re-testing  

Submit reports documenting pressure testing.

**ELECTRIC CONTINUITY TESTING**

Conduct electric continuity test on all ductile iron watermain and copper water services.

The electric continuity test shall be performed using a multi-meter to verify electrical continuity of the watermain system.

The Contractor shall furnish all labor and equipment necessary to conduct the electric continuity test.

Document electric continuity testing by recording the following information:

- Date of test  
- Test methods and equipment  
- Section tested  
- Diameter and length of main under test  
- Number of fittings, valves hydrants, etc.  
- Results of test including resistance  
- If a failed test, describe actions taken to eliminate leaks and results of re-testing  

Submit reports documenting electric continuity testing.

**DISINFECTION/FLUSHING**

After filling the main, allow a minimum of 48 hours of time for disinfection to occur before flushing.

Flush all sections of watermain and water service. When possible, utilize hydrants or other large diameter orifices to complete flushing and achieve 2.5 fps water velocity. If needed, utilize services or temporary connections to complete flushing.

All watermain and services shall be flushed for a minimum of 10 minutes, or as necessary to obtain a sediment-free and bacteriologically safe sample.

Utilize diffusers, hoses, settling basins and other devices as necessary to limit erosion and other damage to the site and downstream areas.

Contractor shall be responsible for providing all necessary fitting, valves, joint restraints, hydrants and other materials necessary to conduct flushing.
Submit reports documenting disinfection and flushing.

**BACTERIOLOGICAL SAMPLE**

Following all pressure testing and flushing, the contractor shall collect a sample from the newly installed watermain or water service(s). Samples shall be submitted to the State Laboratory of Hygiene, or other licensed testing laboratory for bacteriological (coliform bacteria) analysis.

The Contractor shall be responsible for all costs associated with sample collection(s) and analysis.

Document bacteriological sample collection and analysis by recording the following information:

- Date of sample collection
- Sample collection methods and equipment
- Person collecting the sample
- Location(s) sample was collected
- Results of sample analysis

If sample results indicate water is “Unsafe – Coliform Bacteria Present”, Contractor shall re-disinfect watermain and water services by introducing additional chlorine into the line and re-flushing the main. This process shall be repeated as necessary until a clean sample is obtained. The Contractor shall be responsible for all costs associated with all efforts necessary to obtain a “Safe – Coliform Bacteria Not Present” sample.

Submit reports documenting bacteriological sample collection and analysis.

**END OF SECTION**
PART 1 - GENERAL

SCOPE

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. The limits of the work, including the responsible party for testing purposes, shall be clearly defined on the Drawings. Included are the following topics:

PART 1 - GENERAL

Scope
Related Work
Reference Documents
Reference Standards
Submittals
Provisions for Future Work
As-Built Drawings

PART 2 - MATERIALS

PVC Pipe
HDPE Pipe
Ductile Iron Pipe
Connections for Dissimilar Pipe Materials
Manholes
Castings
Manhole Chimney Seal
Drop Manholes
Board Insulation
Tracer Wire
Locator Tape

PART 3 - EXECUTION

General
Diverting Sewage
Diversion Plan
Laying Pipe
Bedding/Utility Cover
Manholes
Casting Installation
Connections to Existing Structures
Sewer Laterals
Pipe Insulation
Tracer Wire
Locator Tape
Deflection Testing
Leakage Testing
Sewer Televising
Abandon Sewer
RELATED WORK

Applicable provisions of Division 1 govern work under this section.

Related work specified elsewhere:
Section 02 32 00 – Geo Technical Investigation
Section 22 11 00 – Facility Water Distribution
Section 22 13 00 – Facility Sanitary Sewerage
Section 22 14 00 – Facility Storm Drainage
Section 30 05 00 – Common Work Results for All Exterior Work
Section 31 23 16.13 – Trenching
Section 31 25 00 – Erosion Control

REFERENCE DOCUMENTS

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. Method of measurement and basis of payment sections in referenced documents shall not apply.

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.

REFERENCE STANDARDS

American Society for Testing and Materials (ASTM) International:
C425
Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings

C700

D1784

D2235

D2564

D2680
Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping

D3034
Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings

D3212

D3350
Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

D4673
Standard Classification System for Acrylonitrile-Butadiene-Styrene (ABS) Plastics and Alloys Molding and Extrusion Materials
F477  Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

F679  Standard Specification for Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings

American Water Works Association (AWWA):

C104/ANSI A21.4  Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings

C151/ANSI A21.53  Standard for Ductile Iron Pipe, Centrifugally Cast

C153/A21.53  Standard for Ductile Iron Compact Fittings

SUBMITTALS

Provide manufacturer’s product information (cut sheets), shop drawings and O&M information for sewer materials including:

- Pipe
- Fittings
- Pre-Cast and Cast-in-Place Structures
- Castings and Covers

Provide wastewater diversion and pumping plan.

Provide reports documenting all required testing and televising. Testing results for the project to the DFD Project Representative and the AE within 48 hours of completing the individual tests.

PROVISIONS FOR FUTURE WORK

Construct sanitary sewer system in a manner that will facilitate future extension or connection.

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.

AS-BUILT DRAWINGS

Show the actual locations of sanitary sewer pipes and service lines, manholes and cleanouts on drawings. Show changes to proposed sanitary sewer pipe, alignment, or grades. Show the actual locations, sizes and types of underground utilities and other features encountered during construction.

PART 2 - MATERIALS

PVC PIPE

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. Do not mix different manufacturer's products, or fittings.

PVC fittings shall be same joint type and SDR as connecting PVC sanitary sewer pipe.
HDPE PIPE

Polyethylene Resin
Polyethylene resin used for manufacturing piping and fittings shall meet ASTM D1248 for Type III, Class C, Grade P34, Category 5, with a PPI recommended designation of PE3408 and a minimum cell classification of PE 345434C in accordance with ASTM D3350. The polyethylene compound shall be combined with carbon black to provide protection against degradation by ultraviolet light. Pipe shall be made from virgin material with no rework compound, except that obtained from the manufacturer’s own production of the same formulation.

Polyethylene Piping
High density polyethylene (HDPE) piping, shall meet the requirements of AWWA C906, current version. Pipe dimensions and workmanship shall be in accordance with ASTM F714 and ASTM D2122. Pipe shall be of diameter shown on the drawings, with dimension ratio (DR) of DR11, unless otherwise noted.

Pipe, fittings, and joints shall meet or exceed the following physical properties:

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>ASTM TEST METHOD</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density, gm/cc</td>
<td>D1505</td>
<td>0.955</td>
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<tr>
<td>Melt Index, gm/10 min</td>
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<tr>
<td>High Load Melt Index, gm/10 min</td>
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<td>Tensile Strength @ Break, psi</td>
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<td>Tensile Strength @ Yield, psi</td>
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<td>Elongation, %</td>
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<td>Flexural Modulus, psi</td>
<td>D790</td>
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<tr>
<td>Environmental Stress Cracking Resistance F_{20'}</td>
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<td>&gt;5,000</td>
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<td>Melting Point, °F</td>
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<td>Vicat Softening Temperature, °F</td>
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<td>255</td>
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<td>Hardness, Shore D</td>
<td>D2240</td>
<td>66</td>
</tr>
<tr>
<td>Volume Resistivity, ohm-cm</td>
<td>D991</td>
<td>2.6 10^{16}</td>
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<td>Recommended Hydrostatic Design Stress:</td>
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<tr>
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<td>1600 psi @ 73.4°F</td>
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</tr>
<tr>
<td></td>
<td>800 psi @ 140°F</td>
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</tr>
</tbody>
</table>

Pipe Marking
Each length of straight and special HDPE pipe and each HDPE fitting shall be plainly marked on the outside to identify the design pressure or class of pipe, proper location of the pipe or fitting in the pipeline, and the date of manufacture.

DUCTILE IRON WATERMAIN

Ductile watermain shall be Class 52, ANSI/AWWA C151/A21.51 centrifugally cast, cement mortar lined meeting the requirements of ANSI/AWWA C104/A21.4.

Ductile iron watermain joints shall be rubber gasket push-on joint or mechanical joint meeting the requirements of ANSI/AWWA C111/A21.11.

Pipe shall be provided with conductive bonding straps to provide electrical continuity.

Pipe shall be manufactured in the United States.
CONNECTIONS FOR DISSIMILAR PIPE MATERIALS

Where new sewer connects to and 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, Husky, or approved equal.

MANHOLES

General
Provide precast concrete manholes. Cast-in-place manholes may only be used after receiving written approval by the DFD Project Representative and the A/E for customized manhole sizes and shapes.

Submit manufacturer's preproduction (shop) drawings for approval prior to the start of manufacturing.

Contractor shall verify existing pipe locations, sizes, orientation and elevation prior to ordering new manholes.

Precast Manhole Sections
Precast concrete manhole sections, including bottom and top shall meet the requirements of ASTM C478.

If conditions require a larger structure than shown on drawings, contact the DFD Project Representative and the A/E.

Provide eccentric cone top sections with a minimum clear opening of 24 inches. Flat top slabs may be used on manholes greater than 6-foot inside diameter.

Manhole wall thickness shall be a minimum of 5 inches for 4-foot inside diameter manholes, 6 inches for 5-foot inside diameter manholes, and 7 inches for 6-foot and 7-foot inside diameter manholes.

Manhole bottom section shall be pre-cast with integral base having a minimum thickness of 8 inches unless otherwise noted.

Joints
Provide manhole riser and barrel sections, cones, and flat tops, with standard pipe section tongue and groove joints.

Seal joints watertight with prefabricated rubber or plastic gaskets or formed in place butyl rubber seal.

Joint sealers: Hamilton Kent, ConSeal, MultiSeal Butyl-Tite, or approved equal.

Connections
Openings for connections shall be cast-in-place or cored and appropriately sized for the type and size of pipe being connected.

Provide flexible, watertight, pipe-to-manhole connections (or "boots") for sanitary sewers; Kor-N-Seal, Hamilton Kent, A-Lok, or an approved equal.

Manhole Steps
Provide steps at 16" O.C. and project approximately 6" from wall.
Manhole steps shall be located in a straight, vertical line from the top of the manhole to the bottom. If the orientation of pipe openings prohibits this, locate manhole steps over the downstream pipe opening.

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.

Bench and Flowline
Provide precast or cast-in-place bench and flowline.

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.

Flowlines shall be formed with gradual, uniform sweeps directed towards the downstream pipe. Provide smooth, troweled finish for flowlines.

When cast-in-place benches and flowline are used, lay the sewer pipe through the manhole.

Adjusting Rings
Fiber-reinforced pre-cast concrete adjusting rings meeting the requirements of ASTM C-478. Provide rings of 2 inches or 4 inches thickness.

Pre-compressed butyl gasket, 3/8”x3½” 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.

CASTINGS

General
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 pickhole.

Standard Manhole Frame and Casting
Neenah Foundry R-1550, with Type B lid; or approved equal.

Low Profile Manhole Frame and Casting
Neenah Foundry R-1689, with Type B lid; or approved equal.

Standard Security Manhole Frame and Casting (Solid Lid)
Neenah Foundry Company R-1916-C with bolt down type B lid; or approved equal. Lid shall be water tight, gasketed, self-sealing, with concealed pick-hole.

Low Profile Security Manhole Frame and Casting (Solid Lid)
Neenah Foundry R-1689, with Type B lid having 4 Type “E” countersunk flatead pent socket screws; or approved equal. Lid shall be water tight, gasketed, self-sealing, with concealed pick-hole.

Manhole Chimney Seal
When indicated on the drawings, provide an internal frame/cone seal meeting requirements of Sections 8.42.3-8.42.5 of the SSSWC.

DROP MANHOLES

Provide outside drop sanitary manholes where shown on the drawings or where the elevation difference between the incoming invert and the springline of the outgoing pipe is greater than 2 feet.
Provide drop manhole bases with integral 1-foot minimum overhanging base.

Pre-cast outside drops will be considered on a case-by-case basis.

Provide outside drop with the same size and type of pipe as the sewer, with a wye or tee into the manhole at the top on the line and grade of the sewer and a one-quarter bend with its invert into the manhole at the elevation of the outlet pipe springline.

**BOARD INSULATION**

Insulation shall be rigid, closed-cell extruded polystyrene insulation suitable for buried insulation. Individual boards shall have dimensions of 8’x4’x2”.

Owens Corning, Dow Styrofoam, or approved equal.

**TRACER WIRE**

Tracer wire shall be #10 solid copper wire with green insulated jacket.

**LOCATOR TAPE**

Tape shall be detectable metallic locator tape, specifically manufactured for marking utilities with a minimum width of 6 inches and detectable at a depth of 18”.

Tape shall be marked “SEWER” and green colored.

**PART 3 - EXECUTION**

**GENERAL**

Complete exploratory excavations at utility crossings as shown on the drawings and as necessary to complete the work.

Maintain clearances between existing or proposed sewer lines and watermains as follows:

- 8” horizontal separation (measured center to center) between existing or proposed sanitary or storm sewers and watermains.
- 12” vertical separation (measured from outsides of pipes) where watermains cross over sanitary or storm sewers.
- 18” vertical separation (measured from outsides of pipes) where watermains cross under sanitary or storm sewers.

Notify the A/E and DFD Project Representative of utility conflicts as soon as they are encountered.

Store and handle pipe in accordance with manufacturers’ recommendations. Keep pipes clean of soil, debris and animals.

**DIVERTING SEWAGE**

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 pumping equipment necessary to carry out the work and allow wastewater to continue to be discharged to the sanitary sewer system. 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 sewage diversion in the event of failure of the primary pumping equipment. The Contractor is solely responsible for sewage diversion.
DIVERSION PLAN

Contractor shall provide a wastewater diversion and pumping plan indicating the order and schedule for completion of the work and associated diversion provisions. The plan shall indicate the location of proposed diversion, pipe size and type, 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 pumps. Contractor’s diversion plan is subject to Owner’s approval prior to implementation.

LAYING PIPE

Install pipe in accordance with the SSSWC and ASTM specifications that pertain to the specified type of pipe material and the installation situation.

Do not use pipe or fittings that are cracked or contain defects.

Clean all pipe of any dirt and/or debris both inside and outside prior to placing in the trench.

Make joints in accordance with manufacturer's directions with due care to avoid damaging pipe and/or disturbing previously laid pipe.

Cut pipe only according to manufacturer's directions.

Lay all sewer pipes to horizontal alignment and grade shown on the drawings with bell ends up hill.

Establish and maintain horizontal alignment. Discrepancies from the required horizontal alignment or grade at any location shall not be greater than 0.10’ or 0.05’, respectively.

BEDDING/UTILITY COVER

Provide Crushed Stone Bedding shall be used for both bedding and utility cover in accordance with the applicable requirements of Section 31 23 16.13 – Trenching.

Where excavation extends below the bottom of the structure's base or the trench, bring the excavation to the required elevation by the use of compacted Crushed Stone Bedding.

A minimum of 8” of compacted Crushed Stone Bedding shall be placed below manhole base.

A minimum of 6” of compacted Crushed Stone Bedding shall be placed below the sanitary sewer pipe and 12” of cover material shall be placed over the sanitary sewer pipe (both measured at the bell of the pipe).

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.

Do not connect abandoned pipes to new manholes.

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 adequate clearance for compaction equipment and operator between structure and trench soil retention for adequate backfilling and compaction.

Set manhole base in accordance with elevation and location as indicated on the drawings. Install base plumb and level. Install subsequent pre-cast manhole sections in accordance with shop drawing layout.

Provide watertight gaskets between each manhole section.
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/foot towards flow channel.

Manholes shall be provided with between 4 inches and 8 inches 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.

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.

Drop manholes shall be constructed in accordance with the SSSWC.

CASTING INSTALLATION

Install casting type as indicated on the drawings or in the specifications.

Provide butyl sealant material between last adjusting ring and casting base. Adjust casting elevation and slope to match adjacent proposed grades.

CONNECTIONS TO EXISTING STRUCTURES

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 hydraulic cement and flexible watertight boots.

SEWER LATERALS

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.

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.

PIPE INSULATION

Provide board insulation where indicated on drawings or where depth of cover is less than 6 feet.

Install insulation on compacted utility 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 utility cover material. Place cover and backfill material in manner that does not damage insulation; replace any damaged insulation.

TRACER WIRE

Provide tracer wire for buried non-metallic sewer piping. Tracer wire shall be installed directly above the top of pipe and within six inches of the pipe.

Splices in tracer wire shall be made with split-bolt or compression-type connectors.
Access points are required every 400 feet or closer. At access points the tracer wire shall be brought to grade with manholes or other covered access devices.

**LOCATOR TAPE**

Install locator tape directly above new non-metallic sanitary sewer pipe approximately 15 inches below finished grade. Bring tape to surface and terminate in valve box or other structure.

**DEFLECTION TESTING**

Test all PVC sewer pipe in the presence of the DFD Project 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.

Size the mandrel 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.

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.

Where poor trench soils conditions require the pipe excavation to be undercut and/or over excavated, the DFD Construction Representative reserves the right to require an additional deflection test prior to the expiration of the Contractor's one year performance guarantee.

Remove and replace all pipe that fails to pass the five (5) percent vertical deflection testing until the pipe passes the deflection test.

**LEAKAGE TESTING**

All new sanitary sewer lines shall be leakage tested in accordance with Chapter 3.7.0 of the SSSWC.

**SEWER TELEVISION**

Upon completion of the sewer construction all new sewers shall be televised to provide a record of the actual conditions inside the newly constructed sewers via closed circuit televising equipment. The DFD Project Representative may or may not be present during sewer inspections via this method.

Utilize televising equipment with a color camera specially designed and equipped for the conditions of the sewers to be televised, and with a monitor screen.

Transport the camera equipment through the sewers by means of mechanical or hand operated winches, coordinated to provide speed and directional control necessary to fully observe the sewer interior. Provide a light source for the necessary illumination.

Provide televising equipment equipped with an on-screen distance meter, capable of registering distances in the sewer from the starting manhole, and accurate to the nearest 0.5’ station, so as to facilitate in the locating of sewer features and/or defects from the ground surface.

Provide televising equipment with an on-screen date and time clock, so as to permit the verification of the date and time of the television inspection.
All video files of the sewer inspection shall contain audio notes describing the sewer location, direction of inspection, and a description of any pertinent features observed during the televised inspection (service locations, leaking or faulty joints, debris in the line, offset joints, etc.). In addition, record this information on a written log or record, in a format of the Contractor's choosing.

The Contractor shall provide to the DFD Project Representative with 2 DVD copies of the CCTV inspection videos and all inspection forms.

**ABANDON SEWER**

Existing sewer that is no longer in service, but is left in place shall be abandoned in accordance with Section 3.2.24 of the SSSWC. Sewer shall not be abandoned until existing services have been reconnected to the replacement sewer.

**END OF SECTION**
SECTION 33 40 00
STORM DRAINAGE UTILITIES
BASED ON DFD MASTER SPECIFICATION DATED 09/01/2015

PART 1 - GENERAL

SCOPE

The work under this section shall consist of providing all work, materials, labor, equipment, and supervision necessary to provide for the storm drainage work required in these specifications and on the drawings. The limits of the work, including the responsible party for testing purposes, shall be clearly defined on the Drawings. Included are the following topics:

PART 1 - GENERAL

Scope
Related Work
Reference Documents
Reference Standards
Submittals
Provisions for Future Work
As-Built Drawings

PART 2 - MATERIALS

Reinforced Concrete Pipe
Connections for Dissimilar Pipe Materials
Manholes
Inlets
Round Catch Basins
Casts
Apron Endwalls
Locator Tape

PART 3 - EXECUTION

General
Laying Pipe
Bedding/Utility Cover
Structures (Manholes, Inlets, Round Catch Basins)
Apron Endwalls
Casting Installation
Connections to Existing Structures
Drainage Laterals
Pipe Insulation
Locator Tape
Deflection Testing
Leakage Testing
Sewer Televising
Abandon Sewer

REFERENCE DOCUMENTS

Wherever WisDOT or SSHSC appears in this specification it shall be construed to mean the pertinent sections of the Wisconsin Department of Transportation, Standard Specifications for Highway and Structure Construction (SSHSC), current edition, and all supplemental and interim supplemental specifications, as they may pertain, except this contract shall be a lump sum contract and measurement and basis of payment methods shall not apply.

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.
REFERENCE STANDARDS

American Society for Testing and Materials (ASTM):

C76    Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
C443   Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
C507   Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe
C877   Standard Specification for External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections

SUBMITTALS

Provide manufacturer’s product information (cut sheets), shop drawings and O&M information for storm drainage materials including:

- Pipe
- Fittings
- Pre-Cast and Cast-in-Place Structures
- Outfalls
- Castings

Provide reports documenting all required testing and televising.

PROVISIONS FOR FUTURE WORK

Construct storm drainage system in a manner that will facilitate future extension or connection to the industrial site as it expands.

AS-BUILT DRAWINGS

Show the actual locations of storm drainage facilities and service lines and structures on drawings. Show changes to proposed storm drainage facilities, alignment, or grades. Show the actual locations, sizes and types of underground utilities and other features encountered during construction.

PART 2 - MATERIALS

REINFORCED CONCRETE PIPE

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.

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 storm drainage pipe joints.

When required, external sealing bands shall meet the requirements of ASTM C877 (Type II), and shall be Mar Mac Mac Wrap, Cretex Wrap, Sealing Systems, Infi-Shield, or approved equal.
CONNECTIONS FOR DISSIMILAR PIPE MATERIALS

Where new storm drainage pipe connects to and existing dissimilar pipe, the connection shall be made with 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, Charlotte, or approved equal.

MANHOLES

General

Provide precast concrete manholes unless otherwise shown or required. Cast-in-place manholes may only be used after receiving written approval by the DFD Project Representative and the A/E for customized manhole sizes and shapes.

Submit manufacturer's preproduction (shop) drawings for approval prior to the start of manufacturing.

Contractor shall carefully locate all pipe locations, sizes, orientation and elevation prior to ordering new manholes.

Precast Manhole Sections

Precast concrete manhole sections, including bottom and top shall meet the requirements of ASTM C478.

If conditions require a larger structure than shown on drawings, contact the DFD Project Representative and the A/E.

Provide eccentric cone top sections with a minimum clear opening of 24". Flat top slabs may be used on manholes greater than 6-foot inside diameter.

Manhole wall thickness shall be a minimum of 5” for 4-foot inside diameter manholes, 6” for 5-foot inside diameter manholes, and 7” for 6-foot and 7-foot inside diameter manholes.

Provide pre-cast manhole base. Manhole bottom section may be pre-cast with integral base.

Joints

Provide manhole riser and barrel sections, cones, and flat tops, with standard pipe section tongue and groove joints.

Seal joints watertight with prefabricated rubber or plastic gaskets or formed in place butyl rubber seal.

Joint sealers: Hamilton Kent, ConSeal, MultiSeal Butyl-Tite, or approved equal.

Connections

Openings for connections in pre-cast structures shall be knock-outs or cut-outs. Cut-outs shall not extend into the joint of the bottom manhole section. Provide a minimum of 12” of separation between the edge of adjacent cut-outs or knock-outs.

Manhole Steps

Provide steps at 16” O.C. and project approximately 6” from wall.
Manhole steps shall be located in a straight, vertical line from the top of the manhole to the bottom. If the orientation of pipe openings prohibits this, locate manhole steps over the downstream pipe opening.

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.

Bench and Flowline
Provide precast or cast-in-place bench and flowline.

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.

Flowlines shall be formed with gradual, uniform sweeps directed towards the downstream pipe. Provide smooth, troweled finish for flowlines.

When cast-in-place benches and flowline are used, lay the storm sewer pipe through the manhole.

Adjusting Rings
Fiber-reinforced pre-cast concrete adjusting rings meeting the requirements of ASTM C-478. Provide rings of 2” or 4” thickness.

Precompressed butyl gasket, 3/8” x 3½” 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.

INLETS & CATCH BASINS

General
Inlets and catch basins shall be round or rectangular precast concrete unless otherwise shown or required. Cast-in-place inlets may only be used after receiving written approval by the DFD Project Representative and the A/E for customized sizes and shapes.

Submit manufacturer's preproduction (shop) drawings for approval prior to the start of manufacturing.

Contractor shall verify pipe locations, sizes, orientation and elevation prior to ordering new inlets.

Precast Inlets & Catch Basins
Precast inlets, shall meet the requirements of ASTM C478.

If field conditions require a larger structure than shown on drawings contact the DFD Project Representative and the A/E.

Joints
Inlets requiring separate base and riser sections must be provided with standard pipe tongue and groove joints.

Seal joints watertight with prefabricated rubber or plastic gaskets or formed in place butyl rubber seal. Joint sealers: Kent Seal, ConSeal, MultiSeal Butyl-Tite or approved equal.

Pipe Connections
Provide custom knock-outs/cut-outs based on project and location specific conditions.
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.

Inlet Flowline
Provide either pre-cast or cast-in-place flowline that provides positive flow through the structure. Provide
bench that directs water towards the flowline.

Flowlines and benches shall be formed with gradual, uniform sweeps directed towards the downstream
pipe. Provide smooth, troweled finish for flowlines.

Catch Basin Sump
Outlet pipe invert shall be located above the bottom of the catch basin as shown in the detail drawings.
Sump shall be watertight.

Adjusting Rings
Fiber-reinforced pre-cast concrete adjusting rings meeting the requirements of ASTM C-478. Provide rings
of 2” or 4” thickness.

Precompressed butyl gasket, 3/8” x 3½” shall be used between the top of the inlet and first adjustment ring,
and between all subsequent rings. Butyl material shall be E-Z Stick, or equal.

CASTINGS

General
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.

Standard Manhole Frame and Casting (Solid Lid)
Neenah Foundry R-1550, with Type B lid; or approved equal.

Low Profile Manhole Frame and Casting (Solid Lid)
Neenah Foundry R-1689, with Type B lid; or approved equal.

Standard Manhole Frame and Casting (Open Grate)
Neenah Foundry R-2050, with Type D grate; or approved equal.

Low Profile Manhole/Round Catch Basin Frame and Casting (Open Grate)
Neenah Foundry R-2464, with Type D grate; or approved equal.

Standard Security Manhole Frame and Casting (Solid Lid)
Neenah Foundry Company R-1916-C with bolt down type B lid; or approved equal.

Standard Security Manhole/Round Catch Basin Frame and Casting (Open Grate)
Neenah Foundry Company R-2050 with Type D grate having 4 Type “E” countersunk flathead pent socket
screws; or approved equal.

Low Profile Security Manhole Frame and Casting (Solid Lid)
Neenah Foundry R-1689, with Type B lid having 4 Type “E” countersunk flathead pent socket screws; or
approved equal.

Low Profile Security Manhole/Catch Basin Frame and Casting (Open Grate)
Neenah Foundry R-2464, with Type D grate having 4 Type “E” countersunk flathead pent socket screws; or
approved equal.
Standard Curb Inlet Casting
Neenah Foundry Company R-3067, with Type A grate; or approved equal.

Gutter Inlet Casting
Neenah Foundry Company R-3290-A; or approved equal.

Flat Inlet Casting
Neenah Foundry Company R-1878-B7G; or approved equal.

APRON ENDWALLS

General
Provide apron endwalls where shown on the drawings and at the following locations:
- Where storm sewers outfall into ditches, swales or other surface water body
- On both ends of a culvert pipe (pipe that crosses under a road, sidewalk, trail or other surface feature)

Unless otherwise indicated, apron endwalls shall be constructed of the same material, same sidewall thickness and to the same design standards as the pipe they are connected to. Apron endwalls shall be the same diameter as the pipe that they are connected to.

Pipe ties shall be constructed using galvanized \( \frac{3}{4} \)" diameter steel rod and hardware, or other approved materials.

Pipe Gates
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.

LOCATOR TAPE
Detectable metallic locator tape, specifically manufactured for marking utilities.

Tape shall be a minimum of 6" wide and shall be marked “STORM”.

PART 3 - EXECUTION

GENERAL
Complete exploratory excavations at utility crossings as shown on the drawings and as necessary to complete the work.

Maintain clearances between existing or proposed storm drainage lines and watermains as follows:
- 8’ horizontal separation (measured center to center) between existing or proposed sanitary or storm drainage lines and watermains.
- 12” vertical separation (measured from outsides of pipes) where watermains cross over sanitary or storm drainage lines.
- 18” vertical separation (measured from outsides of pipes) where watermains cross under sanitary or storm drainage lines.

Notify the A/E and DFD Project Representative of utility conflicts as soon as they are encountered.

Store and handle pipe in accordance with manufacturers’ recommendations. Keep pipes clean of soil, debris and animals.
LAYING PIPE

Install pipe in accordance with the SSSWC and ASTM specifications that pertain to the specified type of pipe material and the installation situation.

Do not use any pipe or fittings cracked in cutting or handling or otherwise not free from defects.

Clean all pipe of any dirt and/or debris both inside and outside prior to placing in the trench.

Make joints in accordance with manufacturer's directions with due care to avoid damaging pipe and/or disturbing previously laid pipe.

Cut pipe only according to manufacturer's directions.

Lay all drainage pipes to horizontal alignment and grade shown on the drawings with bell ends up hill.

Establish and maintain horizontal alignment using total station, transit or theodolite. Discrepancies from the required horizontal alignment or grade at any location shall not be greater than 0.10’ or 0.05”, respectively.

BEDDING/UTILITY COVER

Provide bedding and utility cover in accordance with the applicable requirements of Section 31 23 16.13 – Trenching.

Where excavation extends below the bottom of the structure's base or the trench, bring the excavation to the required elevation by the use of compacted Crushed Stone Bedding.

A minimum of 12” of compacted Crushed Stone Bedding shall be placed below the structure base.

A minimum of 8” of compacted Crushed Stone Bedding shall be placed below the bottom of the apron endwall.

A minimum of 6” of compacted Crushed Stone Bedding shall be placed below the storm drainage pipe and 12” of cover material shall be placed over the storm drainage pipe (both measured at the bell of the pipe).

STRUCTURES (MANHOLES, INLETS, CATCH BASINS)

Structures having improper location and/or orientation of the pipe connections will be rejected. Field repairs or adjustments of connection points are not permitted.

Do not connect abandoned pipes to new structures.

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 adequate clearance for compaction equipment and operator between structure and trench soil retention for adequate backfilling and compaction.

Set structure base in accordance with elevation and location as indicated on the drawings. Install base plumb and level. Install subsequent pre-cast sections in accordance with shop drawing layout. Provide watertight gaskets between each section.

Inlets and Manholes
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.
Catch Basins
Verify sump is clean and watertight after connecting pipes to catch basin.

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.

APRON ENDWALLS
Limit the excavation for apron endwalls so as to provide only the necessary amount of space to sufficiently prepare the subgrade, set the apron endwall, and lay pipe. Provide adequate clearance for compaction equipment and operator between apron endwall and trench soil retention for adequate backfilling and compaction.

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.

Set apron endwall in accordance with elevation and location as indicated on the drawings. Install base plumb and level.

Apron endwalls for pipe greater than 18” 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 bolted through the sidewall of the pipe.

Provide riprap downstream of apron endwalls at all storm drainage outfalls and at other locations as indicated on the drawings.

CASTING INSTALLATION
Install casting type as indicated on the drawings or in the specifications.

Provide butyl sealant material between last adjusting ring and casting base. Adjust casting elevation and slope to match adjacent proposed grades.

CONNECTIONS TO EXISTING STRUCTURES
Make all necessary openings into existing structures or drainage pipes including the reconstruction of existing invert or benches, as necessary. Patch all openings permanently watertight with concrete brick and mortar, hydraulic cement, or flexible watertight boots.

DRAINAGE LATERALS
Connect existing storm drainage laterals in accordance with all of the requirements of the storm drainage mains, including bedding, backfill, compaction, and jointing of the pipe. Connect drainage laterals to the storm drainage 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.

PIPE INSULATION
Provide insulation where indicated on the drawings.

Install insulation on compacted utility 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 utility cover material. Place cover and backfill material in manner that does not damage insulation; replace any damaged insulation.
LOCATOR TAPE

Install locator tape directly above new non-metallic storm sewer pipe approximately 15 inches below finished grade. Bring tape to surface and terminate in a drainage structure.

DEFLECTION TESTING

Test all PVC and HDPE drainage pipe in the presence of the DFD Project 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.

Size the mandrel 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.

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.

Remove and replace all pipe that fails to pass the five (5) percent vertical deflection testing until the pipe passes the deflection test.

LEAKAGE TESTING

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 DFD Project Representative.

SEWER TELEVISING

Upon completion of the sewer construction all new sewers shall be televised to provide a record of the actual conditions inside the newly constructed sewers via closed circuit televising equipment. The DFD Project Representative may or may not be present during sewer inspections via this method.

Utilize televising equipment with a color camera specially designed and equipped for the conditions of the sewers to be televised, and with a monitor screen.

Transport the camera equipment through the sewers by means of mechanical or hand operated winches, coordinated to provide speed and directional control necessary to fully observe the sewer interior. Provide a light source for the necessary illumination.

Provide televising equipment equipped with an on-screen distance meter, capable of registering distances in the sewer from the starting manhole, and accurate to the nearest 0.5’ station, so as to facilitate in the locating of sewer features and/or defects from the ground surface.

Provide televising equipment with an on-screen date and time clock, so as to permit the verification of the date and time of the television inspection.

All video files of the sewer inspection shall contain audio notes describing the sewer location, direction of inspection, and a description of any pertinent features observed during the televised inspection (service locations, leaking or faulty joints, debris in the line, offset joints, etc.). In addition, record this information on a written log or record, in a format of the Contractor's choosing.
The Contractor shall provide to the DFD Project Representative with 2 DVD copies of the CCTV inspection videos and all inspection forms.

**ABANDON SEWER**

Where indicated on the drawings, existing sewer to be left in place shall be abandoned in accordance with Section 3.2.24 of the SSSWC. Sewer shall not be abandoned until existing laterals have been reconnected to the replacement sewer. Abandoning sewers is considered incidental to the construction.

**END OF SECTION**
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<td>236</td>
<td>U DETAIL - WATER BRANCH SERVICE PIPE TAP</td>
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## CONTACT INFORMATION

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MADISON, WI 53706

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(715) 672-8770 - EXT. 3
DCHALL@NELSON-TEL.NET

## LOCATION MAP

The concepts, drawings and written materials provided here were prepared by students in the Department of Civil & Environmental Engineering at the University of Wisconsin-Madison as an activity in the course Civ Engr 578 - Senior Capstone Design/GLE 479 - Geological Engineering Design. These do not represent the work products of licensed Professional Engineers. These are not for construction purposes. Typical for all drawings.

By: MD  Date: 12/3
Check: CJ  Date: 12/3
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### Opinion of Probable Costs

#### Proposed Site B Phase 1

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**Subtotal - Trades Phase 1**

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**Subtotal - Construction**

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**Subtotal - A&E**

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**Project Contingency**

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**Site B Project Total**

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**Subtotal - Trades Phase 1** $2,960,000

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**Subtotal - Construction** $377,400

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**Subtotal - A&E** $236,800

**Phase 1 Project Cost** $3,570,000

**Project Contingency** 15%

**Site B Project Total** $4,110,000
Calculus Based Chemistry:

Calculate the pH of a solution containing $10^{-4}$ M OCl$_{tot}$, 90% of which is present as HOCl. The solution also contains $7 \times 10^{-3}$ M H$_2$CO$_3^\ast$.

Species present: H$^+$, OH$^-$, H$_2$O, OCl$^-$, HOCl, H$_2$CO$_3^\ast$, HCO$_3^-$, CO$_3^{2-}$.

Known Concentrations: [OCl$^-$], [HOCl], [H$_2$CO$_3^\ast$]

Assumptions:
- Activity $\approx$ Concentration because Ionic Strength (I) $<$ 0.1
- System is at apparent equilibrium; therefore, we do not need to solve the carbonate system. Proton concentration will not change but is affected by [HOCl] and [OCl$^-$]; therefore, we can use these two species to find [H$^+$].

Solution:

$$K_{a,HOCl} = \frac{[OCl^-][H^+]}{[HOCl]} = 10^{-7.54}$$

$$[HOCl] = 0.9 \times OCl_{tot} = 9 \times 10^{-5} \text{ M}$$

$$[OCl^-] = 0.1 \times OCl_{tot} = 1 \times 10^{-5} \text{ M}$$

Using the Henderson-Hasselbach Equation:

$$pH = pK_a + \log\left(\frac{[OCl^-]}{[HOCl]}\right) = 6.56$$

Implications:
HOCl is often used in water treatment plants as a disinfectant. It is important to know the pH of the effluent water going to the distribution system. Too acidic, and older lead pipes may leach lead into the water. Iron pipes my corrode, turning water an ugly orange/brown color. Hypochlorous acid also disinfects best at certain pHs. Therefore, it is important to monitor and control the pH of the treatment water, keeping the pH at a level that is not corrosive for the pipes, but still disinfectant.
Differential Equation:

Use a differential equation to solve an environmental engineering application regarding water pollution in a lake:

A lake with a volume of 100,000 m$^3$ has a river flowing through it (flow of river into lake = flow of river out of lake). The river is carrying a contaminant into the lake at a concentration of 5 ppm and is flowing at a rate of 100 m$^3$/day. Find how long it takes for the uncontaminated lake to have a concentration of 2 ppm of contaminant.

c = concentration in lake  
Q = flow of river  
V = volume of lake  
p = concentration of river  
t = time

Solution:

\[
\frac{dc(t)}{dt} = -\frac{Q}{V} (c(t) - p) = -0.001 (c(t) - 5)
\]

\[
\frac{dc(t)}{dt} + 0.001c = 0.005
\]

\[
\frac{d}{dt} (e^{0.001t}c(t)) = 0.005e^{0.001t}
\]

Now by integrating both sides,

\[
c(t) = 5 + Ce^{-0.001t}
\]

And because the concentration of pollutant at t = 0 is 0 ppm \(\rightarrow c(0) = 0 \text{ ppm}\)

\[
c(t) = 5 - 5e^{-0.001t}
\]

By plugging in 2 for the concentration in the lake, we can solve for time,

\[
2 = 5 - 5e^{-0.001t}
\]

\[
t = 510.8 \text{ days}
\]
UniverCity Year is a three-phase partnership between UW-Madison and one community in Wisconsin. The concept is simple. The community partner identifies projects that would benefit from UW-Madison expertise. Faculty from across the university incorporate these projects into their courses, and UniverCity Year staff provide administrative support to ensure the collaboration’s success. The results are powerful. Partners receive big ideas and feasible recommendations that spark momentum towards a more sustainable, livable, and resilient future. Join us as we create better places together.