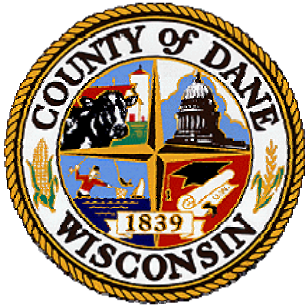


**RFB NO. 312001**



## **CONSTRUCTION DOCUMENTS PROJECT MANUAL**

DANE COUNTY DEPARTMENT OF PUBLIC WORKS,  
HIGHWAY AND TRANSPORTATION

PUBLIC WORKS ENGINEERING DIVISION  
1919 ALLIANT ENERGY CENTER WAY  
MADISON, WISCONSIN 53713

### **REQUEST FOR BIDS NO. 312001 BABCOCK AND LAFOLLETTE PARKS LOCKS & DAMS RENOVATION PHASE 2 - LOCKS & DAMS UPGRADES DANE COUNTY, WISCONSIN**

Due Date / Time: **THURSDAY, MARCH 1, 2012 / 2:00 P.M.**

Location: **PUBLIC WORKS OFFICE**

Performance / Payment Bond: **100% OF CONTRACT AMOUNT**

Bid Deposit: **5% OF BID AMOUNT**

---

FOR INFORMATION ON THIS REQUEST FOR BIDS, PLEASE CONTACT:

ROB NEBEL, PROJECT ENGINEER  
TELEPHONE NO.: 608-267-0119  
FAX NO.: 608-267-1533  
E-MAIL: [NEBEL@COUNTYOFDANE.COM](mailto:NEBEL@COUNTYOFDANE.COM)

## **DOCUMENT INDEX FOR RFB NO. 312001**

### **PROCUREMENT AND CONTRACTING REQUIREMENTS**

- Project Manual Cover Page
- Documents Index
- Invitation to Bid (Legal Notice)
- Instructions to Bidders
- Bid Form
- Fair Labor Practices Certification
- Best Value Contracting Application
- Sample Public Works Contract
- Sample Bid Bond
- Sample Performance Bond
- Sample Payment Bond
- General Conditions of Contract
- Supplementary Conditions

### **DIVISION 01 - GENERAL REQUIREMENTS**

- 01 00 00 - Basic Requirements
- 01 74 19 - Recycling

### **DIVISION 02 - EXISTING CONDITION**

- 02 41 13 - Site Demolition
- 02 41 19 - Selective Demolition

### **DIVISION 03 - CONCRETE**

- 03 01 00 - Concrete Restoration
- 03 31 00 - Structural Concrete
- 03 31 71 - Concrete Rehabilitation
- 03 45 04 Plant Precast Architectural Concrete Building

### **DIVISION 05 - METALS**

- 05 12 00 - Structural Steel Framing
- 05 50 00 - Metal Fabrications
- 05 50 13 - Metal Fishing Platforms

### **DIVISION 09 - FINISHES**

- 09 96 00 - High-Performance Coatings

### **DIVISION 26 - ELECTRICAL**

- 26 00 00 - Basic Electrical Requirements
- 26 05 01 - Minor Electrical Demolition and Alterations
- 26 05 03 - Wiring Connections
- 26 05 19 - Building Wire and Cable
- 26 05 26 - Grounding and Bonding
- 26 05 33 - Raceway and Boxes
- 26 07 00 - Electrical Utility Services
- 26 24 16 - Panelboards
- 26 27 26 - Wiring Devices
- 26 28 19 - Enclosed Switches

26 51 00 - Interior Lighting  
26 56 00 - Exterior Lighting

**DIVISION 28 - ELECTRONIC SAFETY AND SECURITY**

28 23 03 - Video Flow Monitoring

**DIVISION 31 - EARTHWORK**

31 05 13 - Soils for Earthwork  
31 05 16 - Aggregates for Earthwork  
31 22 13 - Rough Grading  
31 23 17 - Site Excavation, Backfill, and Compaction  
31 25 13 - Erosion Controls  
31 37 00 - Riprap and Rock Lining  
31 52 00 - Cofferdams

**DIVISION 32 - EXTERIOR IMPROVEMENTS**

32 01 00 - Site Restoration  
32 11 23 - Aggregate Base Course  
32 12 16 - Asphalt Paving  
32 31 13 - Chain Link Fences and Gates

**DIVISION 35 - WATERWAY AND MARINE**

35 20 16 - Miter Gates  
35 20 17 - Hydraulic System for Miter Gates  
35 20 18 - Vertical Lift Weir Gates  
35 20 19 - Vertical Lift Gate Automated Controls

**DRAWINGS**

To be printed to correct scale or size, plot sheets on (C), 24" x 36" paper.

Cover Sheet

C-1 - Existing Site Plan - Babcock Lock and Dam

C-2 - Proposed Site Plan - Babcock Lock and Dam

C-3 - Existing Site Plan - LaFollette Lock and Dam

C-4 - Proposed Site Plan - LaFollette Lock and Dam

C-5 - Site and Erosion Control Details

C-6 - Fence Details

C-7 - Scour Repair Details

S-1 - General Notes

S-2.2 - Concrete Repairs - Babcock Lock and Dam - Phase 2

S-3 - Renovation Plans- Babcock Lock and Dam

S-4.2 - Concrete Repairs - LaFollette Lock and Dam - Phase 2

S-5 - Renovation Plans- Babcock Lock and Dam

S-6 - Concrete Repair Details

S-7 - Lock Gates Elevation and Details

S-8 - Dam Platform - Babcock

S-9 - Dam Platform - LaFollette

S-10 - Dam Gate Sections and Details

S-11 - Equipment Shed Sections and Details

S-12 - Fishing Platform Sections and Details

E-0 - Electrical Symbols and Abbreviations

E-1 - Site Electrical Plan and Details - Babcock Lock and Dam

E-2 - Schedules - Babcock Lock and Dam  
E-3 - Site Electrical Plan and Details - LaFollette Lock and Dam  
E-4 - Schedules - LaFollette Lock and Dam  
M-1 - Lock Controls Sections and Details  
M-2 - Hydraulic Lock Controls Sections and Details

## LEGAL NOTICE

### INVITATION TO BID

Dane County Public Works, Highway & Transportation Department, 1919 Alliant Energy Center Way, Madison, WI 53713, will receive sealed Bids until:

**2:00 P.M., THURSDAY, MARCH 1, 2012**

#### REQUEST FOR BIDS NO. 312001

#### BABCOCK AND LAFOLLETTE PARKS LOCKS AND DAMS RENOVATION

#### PHASE 2 - LOCKS AND DAMS UPGRADES

#### DANE COUNTY, WISCONSIN

Dane County is inviting Bids for construction services. Phase 2 of this 2 phase project will repair, replace or modify structural, mechanical, electrical & controls components of existing locks & dams on the Yahara River. A separate, earlier and concurrent Phase 1 project will repair deteriorated concrete & modify existing structures at these facilities. Only firms with capabilities, experience & expertise with similar concrete repair projects should request this packet & submit Bids.

Request for Bids package may be obtained at Dane County Public Works, Highway & Transportation Dept., 1919 Alliant Energy Center Way, Madison, WI 53713, by calling 608-266-4018, or downloading it from [www.countyofdane.com/pwht/bid/logon.aspx](http://www.countyofdane.com/pwht/bid/logon.aspx). Please call Rob Nebel, Project Engineer, at 608-267-0119, for any questions or additional information.

All Bidders must be a registered vendor with Dane County and pay an annual registration fee in order for Bid to be considered. Complete Vendor Registration Form at [www.danepurchasing.com/registration](http://www.danepurchasing.com/registration) or obtain one by calling 608-266-4131.

Bidders site tour will be held on February 14, 2012 at 9:00 AM starting at Babcock Park, 2909 US Highway 151, McFarland, WI, proceeding afterward to LaFollette Park, 2248 Williams Drive, Stoughton, WI. Bidders are required to attend this mandatory tour in order to bid on the Work. Optional second site tour will be held on February 21, 2012 at 1:30 PM **ONLY** if bidders arrange it in advance with the Project Engineer.

**PUBLISH: FEBRUARY 2 & 9, 2012 - WISCONSIN STATE JOURNAL**

**FEBRUARY 2 & 9, 2012 - THE DAILY REPORTER**

# INSTRUCTIONS TO BIDDERS

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### **1. GENERAL**

- A. Before submitting Bid, bidder shall thoroughly examine all Construction Documents. Successful Bidder shall be required to provide all the Work that is shown on Drawings, set forth in Specifications, or reasonably implied as necessary to complete Contract for this project.
- B. Bidder shall visit site to become acquainted with adjacent areas, means of approach to site, conditions of actual site and facilities for delivering, storing, placing, and handling of materials and equipment.
- C. Pre-bid meeting / site tour is scheduled on February 14, 2012 at 9:00 AM starting at Babcock Park, 2909 US Highway 151, McFarland, WI, proceeding afterward to LaFollette Park, 2248 Williams Drive, Stoughton, WI. Attendance by all bidders is mandatory. Other subcontractors to bidders are encouraged to attend. Optional second site tour will be held on February 21, 2012 at 1:30 PM ONLY if bidders arrange it in advance with the Project Engineer.
- D. Visits at other times can also be arranged. Coordinate site access activities with Public Works Project Engineer, Rob Nebel, 608/267-0119.
- E. Failure to visit site or failure to examine any and all Construction Documents will in no way relieve successful Bidder from necessity of furnishing any necessary materials or equipment, or performing any work, that may be required to complete the Work in accordance with

Drawings and Specifications. Neglect of above requirements will not be accepted as reason for delay in the Work or additional compensation.

## **2. DRAWINGS AND SPECIFICATIONS**

- A. Drawings and Specifications that form part of this Contract, as stated in Article 1 of General Conditions of Contract, are enumerated in Document Index of these Construction Documents.
- B. Complete sets of Drawings and Specifications for all trades will be issued to all Bidders, irrespective of category of work to be bid on, in order that all Bidders may be familiar with work of other trades as they affect their bid.

## **3. INTERPRETATION**

- A. No verbal explanation or instructions will be given in regard to meaning of Drawings or Specifications before Bid Due Date. Bidders shall bring inadequacies, omissions or conflicts to Owner or Architect / Engineer's attention at least ten (10) days before Bid Due Date. Prompt clarification will be available to all bidders by Addendum.
- B. Failure to so request clarification or interpretation of Drawings and Specifications will not relieve successful Bidder of responsibility. Signing of Contract will be considered as implicitly denoting that Contractor has thorough understanding of scope of the Work and comprehension of Construction Documents.
- C. Owner or Consultant / Engineer will not be responsible for verbal instructions.

## **4. QUALIFICATIONS OF BIDDER (CONTRACTOR AND SUBCONTRACTOR)**

- A. Before award of Contract can be approved, Owner shall be satisfied that Bidder involved meets following requirements:
  - 1. Has completed at least one (1) project of at least fifty percent (50%) of size or value of Division of work being bid and type of work completed is similar to that being bid. If greater magnitude of experience is deemed necessary, other than size or value of work, such requirements will be described in appropriate section of Specifications.
  - 2. Maintains permanent place of business.
  - 3. Can be bonded for terms of proposed Contract.
  - 4. Has record of satisfactorily completing past projects and supplies list of three (3) most recent, similar projects, with architect or engineer's and owner's names, addresses and telephone numbers for each project. If more than three (3) projects must be listed to show Contractor has done work encompassing scope of this project, that is acceptable. Do not submit extensive list of all projects completed or projects that are not specifically similar to this one. Submit to Public Works Project Engineer with Bid on Bid Due Date. Criteria which will be considered in determining satisfactory completion of projects by bidder will include:
    - a) Completed contracts in accordance with drawings and specifications.
    - b) Diligently pursued execution of work and completed contracts according to established time schedule unless Owner grants extensions.
    - c) Fulfilled guarantee requirements of construction documents.

- d) Is not presently on ineligible list maintained by County's Department of Administration for noncompliance with equal employment opportunities and affirmative action requirements.
  - e) Authorized to conduct business in Wisconsin. By submitting Bid, bidder warrants that it has: complied with all necessary requirements to do business in State of Wisconsin; that persons executing contract on its behalf are authorized to do so; and, if corporation, that name and address of bidder's registered agent are as set forth in Contract. Bidder shall notify Owner immediately, in writing, of any change in its registered agent, their address, and bidder's legal status. For partnership, term "registered agent" shall mean general partner.
- B. County's Public Works Project Engineer will make such investigations as are deemed necessary to determine ability of bidder to perform the Work, and bidder shall furnish to County's Public Works Project Engineer or designee all such information and data for this purpose as County's Public Works Project Engineer may request. Owner reserves right to reject Bid if evidence submitted by, or investigation of, bidder fails to satisfy Owner that bidder is responsible and qualified to carry out obligations of Contract and to complete the Work contemplated therein.

## **5. BID GUARANTEE**

- A. Bank certified check, cashier's check or Bid Bond, payable to County in amount not less than five percent (5%) of maximum bid, shall accompany each Bid as guarantee that if Bid is accepted, Bidder will execute and return proposed Contract and Performance and Payment Bonds within ten (10) days after being notified of acceptance of Bid. Company issuing bonds must be licensed to do business in Wisconsin.
- B. Any bid, which is not accompanied by bid guarantee, will be considered "No Bid" and will not be read at Bid Due Date.
- C. If successful Bidder so delivers Contract, Certificate of Insurance, and Performance and Payment Bonds, check will be returned to Bidder. In case Bidder fails to deliver such Contract, insurance, and bond, amount of bid guarantee will be forfeited to County as liquidated damages.
- D. All checks tendered as bid guarantee, except those of three lowest qualified, responsible bidders, will be returned to their makers within three (3) days after Bid Due Date. All such retained checks will be returned immediately upon signing of Contract and Performance and Payment Bonds by successful Bidder.

## **6. WITHDRAWAL OF BIDS**

- A. Bids may be withdrawn by written request received from bidder or authorized representative thereof prior to time fixed for Bid Due Date, without prejudice to right of bidder to file new Bid. Withdrawn Bids will be returned unopened. Negligence on part of bidder in preparing their Bid confers no right for withdrawal of Bid after it has been opened.
- B. No Bid may be withdrawn for period of sixty (60) days after Bid Due Date.
- C. If Bid contains error, omission or mistake, bidder may limit liability to amount of bidder's guarantee by giving written Notice of Intent not to execute Contract to Owner within seventy-two (72) hours of Bid Due Date.



## 7. CONTRACT FORM

- A. Sample copy of contract that successful Bidder will be required to enter into is included in these Construction Documents and bidders are required to familiarize themselves with all conditions contained therein.

## 8. CONTRACT INTERESTS BY COUNTY PUBLIC OFFICIALS

- A. In accordance with Wisconsin Statute 946.13, county official may not bid for or enter into any contract involving receipts or disbursements of more than \$15,000.00 in a year, in which they have private pecuniary interest, direct or indirect if at same time they are authorized to take official action with respect to making of this Contract. Any contract entered into in violation of this Statute is void and County incurs no liability thereon. This subsection does not affect application and enforcement of Wisconsin Statute 946.13 by state prosecutors in criminal courts of this state.

## 9. EMERGING SMALL BUSINESS PROVISIONS

- A. **Emerging Small Business Definition.** For purposes of this provision, ESB is defined as:
  - 1. Independent business concern that has been in business minimum of one year;
  - 2. Business located in State of Wisconsin;
  - 3. Business comprised of less than 25 employees;
  - 4. Business must not have gross sales in excess of three million dollars (\$3,000,000.00) over past three years; and
  - 5. Business does not have history of failing to complete projects.
- B. **Emerging Small Business (ESB) Involvement.** Bidder shall make good faith effort to award minimum of ten percent (10%) of the Work to ESBs. Bidder shall submit report to Dane County Contract Compliance Officer within twenty-four (24) hours after Bid Due Date demonstrating such efforts. Good faith efforts means significant contact with ESBs for purposes of soliciting bids from them. Failure to make or demonstrate good faith efforts will be grounds for disqualification.
- C. **Emerging Small Business Report.** Emerging Small Business Enterprise Report is to be submitted by Bidder in separate envelope marked "Emerging Small Business Report". This report is due by 2:00 p.m. following specified twenty-four (24) hours after Bid Due Date. Bidder who fails to submit Emerging Small Business Report shall be deemed not responsive.
- D. **ESB Goal.** Ten percent (10%) ESB participation is goal of this project. ESB utilizations are shown as percentage of total Bid. If Bidder meets or exceeds specified goal, Bidder is only required to submit Form A - Certification, and Form B - Involvement. Goal shall be met if Bidder qualifies as ESB.
- E. **Report Contents.** Following award of Contract, Bidder shall submit copies of executed contracts for all Emerging Small Businesses. Emerging Small Business Report shall consist of these:
  - 1. Form A - Certification;

2. Form B - Involvement;
  3. Form C - Contacts;
  4. Form D - Certification Statement (if appropriate); and
  5. Supportive documentation (i.e., copies of correspondence, telephone logs, copies of advertisements).
- F. **ESB Listing.** Bidders will solicit bids from ESB listing provided by Dane County.
- G. **ESB Certification.** All contractors, subcontractors and suppliers seeking ESB certification must complete and submit Emerging Small Business Certification Application to Dane County Contract Compliance Program.
- H. **Certification Statement.** If ESB firm has not been certified by County as ESB prior to submittal of this Bid, ESB Report cannot be used to fulfill ESB goal for this project unless firm provides "Form D - Certification Statement". Certification statement must be completed and signed by ESB firm.
- I. **Questions.** Questions concerning Emerging Small Business provisions shall be directed to:  
Dane County Contract Compliance Officer  
City-County Building, Room 421  
210 Martin Luther King, Jr. Blvd.  
Madison, WI 53703  
608/266-5623
- J. **Substituting ESBs.** In event of any significant changes in subcontract arrangements or if need arises to substitute ESBs, Bidder shall report such proposed changes to Contract Compliance Officer to making any official changes and request authorization to substitute ESB firm. Bidder further agrees to make every possible effort to replace ESB firm with another qualified ESB firm.
- K. **Good Faith Efforts.** Good faith efforts can be demonstrated by meeting all of these obligations:
1. Selecting portions of the Work to be performed by ESBs in order to increase likelihood of meeting ESB goal including, where appropriate, breaking down Contract into smaller units to facilitate ESB participation.
  2. Advertising in general circulation, trade associations, and women / minority focus media concerning subcontracting opportunities.
  3. Providing written notices to reasonable number of specific ESBs that their interest in Contract was being solicited in sufficient time to allow ESBs to participate effectively.
  4. Following up on initial solicitations of interest by contacting ESBs within five (5) working days prior to Bid Due Date to determine with certainty whether ESB were interested, to allow ESBs to prepare bids.
  5. Providing interested ESB with adequate information about Drawings, Specifications and requirements of Contract.

6. Using services of available minority, women and small business organizations and other organizations that provide assistance in recruitment of MBEs / WBEs / ESBs.
7. Negotiating in good faith with interested ESBs, not rejecting ESBs as unqualified without sound reason based on thorough investigation of their capabilities.
8. Submitting required project reports and accompanying documents to County's Contract Compliance Officer within twenty-four (24) hours after Bid Due Date.

L. **Appeals Disqualification of Bid.** Bidder who is disqualified may appeal to Public Works & Transportation Committee and Equal Opportunity Commission.

## **10. METHOD OF AWARD - RESERVATIONS**

- A. Following will be basis of award of Contract, providing cost does not exceed amount of funds then estimated by County as available to finance Contract(s):
  1. Lowest dollar amount submitted by qualified responsible bidder on Base Bid for all work comprising project, combined with such additive Owner accepted alternates.
  2. Owner reserves right to reject all bids or any bid, to waive any informality in any bid, and to accept any bid that will best serve interests of County.
  3. Unit Prices and Informational Bids will not be considered in establishing low bidder.

## **11. SECURITY FOR PERFORMANCE AND PAYMENTS**

- A. Simultaneous with delivery of signed Contract, Bidder shall be required to furnish Performance and Payment Bonds as specified in Article 29 of General Conditions of Contract, "Contract Security". Surety Company shall be licensed to do business in Wisconsin. Performance and Payment Bonds must be dated same date or subsequent to date of Contract. Performance and Payment Bonds must emulate information in Sample Performance and Payment Bonds in Construction Documents.
- B. Provide certified copy of power of attorney from Surety Company showing that agent who signs Bond has power of attorney to sign for Surety Company. Secretary or Assistant Secretary of company must sign this certification, not attorney-in-fact. Certification must bear same or later date as Bond. Power of Attorney must emulate model power of attorney information detailed in Sample Performance and Payment Bonds.
- C. If Bidder is partnership or joint venture, State certified list, providing names of individuals constituting partnership or joint venture must be furnished. Contract itself may be signed by one partner of partnership, or one partner of each firm comprising joint venture, but Performance and Payment Bonds must be signed by all partners.
- D. If Bidder is a corporation, it is necessary that current certified copy of resolution or other official act of directors of corporation be submitted showing that person who signs Contract is authorized to sign contracts for corporation. It is also necessary that corporate seal be affixed to resolution, contract, and performance and payment bonds. If your corporation has no seal, it is required that above documents include statement or notation to effect that corporation has no seal.

## **12. TAXES**

- A. Bidder shall include in Bid, all Sales, Consumer, Use and other similar taxes required by law.
- B. In accordance with Wisconsin Statute 71.80(16)(a), successful nonresident bidder, whether incorporated or not, and not otherwise regularly engaged in business in this state, shall file surety bond with State of Wisconsin Department of Revenue payable to Department of Revenue, to guarantee 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. Amount of bond shall be three percent (3%) of Contract or subcontract price on all contracts of \$50,000 or more.

### **13. SUBMISSION OF BIDS**

- A. All Bids shall be submitted on standard Bid Form bound herein and only Bids that are made on this Bid Form will be considered. Entire Bid Form and other supporting documents, if any, shall be removed or copied from Construction Documents, filled out, and submitted in manner specified hereinafter. Submit completed Bid Bond with Bid as well.
- B. No bids for any subdivision or any sub-classification of this Work, except as indicated, will be accepted. Any conditional Bid, amendment to Bid Form or appended item thereto, or inclusion of any correspondence, written or printed matter, or details of any nature other than that specifically called for, which would alter any essential provision of Construction Documents, or require consideration of unsolicited material or data in determining award of Contract, will disqualify Bid. Telecommunication alterations to Bid will not be accepted.
- C. Bidders must submit single Bid for all the Work.
- D. Bid amounts shall be inserted in words and in figures in spaces provided on Bid Form; in case of conflict, written word amounts will govern.
- E. Addenda issued after Bid Letting shall become part of Construction Documents. Bidders shall acknowledge receipt of such addenda in appropriate space provided on Bid Form. Bid will be rejected if receipt of any particular addendum applicable to award of Contract has not been acknowledged on Bid Form.
- F. Bids shall be signed, placed in envelope, sealed and delivered before time of closing to place designated in Invitation to Bid, and identified with project name, bid number, location, category of work being bid upon, Bid Due Date, name and address of bidder.
- G. Bidder shall be responsible for sealed Bid being delivered to place designated for Bid Due Date on or before date and time specified. Bids received after time of closing will be rejected and returned to bidder unopened.
- H. Bid will be considered invalid and will be rejected if bidder has not signed it.
- I. Faxed Bids will not be accepted.
- J. Bidder's organization shall submit completed with Bid, Fair Labor Practices Certification form, included in these Construction Documents.

### **14. SUBCONTRACTOR LISTING**

- A. Bidders shall be required to submit list of major subcontractors for General Construction, Plumbing, HVAC, and Electrical work proposed for this project to include committed prices for each subcontractor. List shall be placed in separate sealed envelope that must be clearly identified as “Major Subcontractor List”, for named project and name of Bidder submitting it. County must receive envelope no later than date by which successful Bidder is required to submit his or her signed Contract, as established in Construction Documents.

#### **15. ALTERNATE BIDS**

- A. Bidder shall carefully read requests for Alternate Bids, and thoroughly examine Drawings and Specifications to determine extent various changes and conditions will affect Bid.
- B. Space is provided in Bid Form for requested Alternate Bids. Failure to submit bid for any requested Alternate Bids may result in rejection of entire Bid.
- C. Bidder shall state amount to be added / subtracted to Base Bid for providing alternates, including all incidentals, omissions, additions, and adjustments as may be necessary or required by such changes. If there is no difference in price, Bidder shall state, “No Change”.
- D. Descriptions of requested Alternate Bids are as set forth in Construction Documents.

#### **16. INFORMATIONAL BIDS**

- A. Bidder shall state amount that is included in Base Bid for all equipment, materials and labor required to complete the Work described. Informational bids are amounts requested for accounting purposes and for allocation of funds only. It is not intended to omit any of the Work described or related items from this project.
- B. Description of requested Informational Bids, if any, is as set forth in Construction Documents.

#### **17. UNIT PRICES**

- A. Provide unit prices where requested on Bid Form. Unit prices will include all costs for materials, labor, insurance, taxes, overhead and profit necessary to perform specified work. Estimated quantities are approximate only. Payment will be based upon actual quantities placed, provided or installed. Failure to provide requested unit prices may result in rejection of entire Bid.
- B. Owner reserves right to accept or reject any unit prices as given in Bid.
- C. Bidder shall refer to Bid Form and applicable specification section to determine basis of unit measure and detailed information related to each unit price item requested.

#### **18. COMMENCEMENT AND COMPLETION**

- A. Successful Bidder shall commence work when schedule and weather permit, but no later than stated in Bid Form. Contractor shall pursue the Work regularly and continuously at reasonable rate to insure completion of the Work within time stated in Bid.

- B. Should it be found impossible to complete the Work on or before time specified for completion, written request may be submitted for extension of time setting forth reasons believed to justify granting of such request. Refer to Article 20 of General Conditions of Contract, titled "Time for Completion".

#### **19. WORK BY OWNER**

- A. This work will be accomplished by Owner or will be let under separate contracts and will not be included under this Contract:
1. Electrical service from utility grid to local transformers (new or existing) at each site. General Contractor responsible for power & wiring from transformers to loads.
  2. One 16' to 24' utility pole at each site. General Contractor to mount the flow monitoring cameras on these poles.
  3. Replace light fixture on existing to remain utility pole at each site.
  4. Repair, refurbish or replace existing pin and shoe assemblies on bottom of lock gates; to be determined after Contractor removes the gates.

#### **20. SPECIAL HAZARDS COVERAGE**

- A. Not Applicable.

**FORM A**

**DANE COUNTY  
EMERGING SMALL BUSINESS REPORT - CERTIFICATION**

In accordance with General Conditions of Contract, submit this Emerging Small Business Report within 24 hours after Bid Due Date.

PROJECT NAME: \_\_\_\_\_

\_\_\_\_\_

BID NO.: \_\_\_\_\_ BID DUE DATE: \_\_\_\_\_

**BIDDER INFORMATION**

COMPANY NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

\_\_\_\_\_

TELEPHONE NO.: \_\_\_\_\_

CONTACT PERSON: \_\_\_\_\_

**FORM B**

**DANE COUNTY  
EMERGING SMALL BUSINESS REPORT - INVOLVEMENT**

Page \_\_\_ of \_\_\_  
(Copy this Form as necessary to provide complete information)

COMPANY NAME: \_\_\_\_\_

PROJECT NAME: \_\_\_\_\_ BID NO.: \_\_\_\_\_

ESB NAME: \_\_\_\_\_ CONTACT PERSON: \_\_\_\_\_

ADDRESS: \_\_\_\_\_ PHONE NO.: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

**Indicate percentage of financial commitment to this ESB: \_\_\_\_\_ % Amount: \$ \_\_\_\_\_**

ESB NAME: \_\_\_\_\_ CONTACT PERSON: \_\_\_\_\_

ADDRESS: \_\_\_\_\_ PHONE NO.: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

**Indicate percentage of financial commitment to this ESB: \_\_\_\_\_ % Amount: \$ \_\_\_\_\_**

ESB NAME: \_\_\_\_\_ CONTACT PERSON: \_\_\_\_\_

ADDRESS: \_\_\_\_\_ PHONE NO.: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

**Indicate percentage of financial commitment to this ESB: \_\_\_\_\_ % Amount: \$ \_\_\_\_\_**



**FORM C**

**DANE COUNTY  
EMERGING SMALL BUSINESS REPORT - CONTACTS**

Page \_\_\_ of \_\_\_  
(Copy this Form as necessary to provide complete information)

COMPANY NAME: \_\_\_\_\_

PROJECT NAME: \_\_\_\_\_ BID NO.: \_\_\_\_\_

	<u>ESB FIRM NAME CONTACTED</u>	<u>DATE</u>	<u>PERSON CONTACTED</u>	<u>DID ESB BID?</u>	<u>DID YOU ACCEPT BID?</u>	<u>REASON FOR REJECTION</u>
1)	_____	_____	_____	_____	_____	_____
2)	_____	_____	_____	_____	_____	_____
3)	_____	_____	_____	_____	_____	_____
4)	_____	_____	_____	_____	_____	_____
5)	_____	_____	_____	_____	_____	_____
6)	_____	_____	_____	_____	_____	_____
7)	_____	_____	_____	_____	_____	_____

**FORM D**

**DANE COUNTY  
EMERGING SMALL BUSINESS REPORT - CERTIFICATION STATEMENT**

I, \_\_\_\_\_, \_\_\_\_\_ of  
Name Title

\_\_\_\_\_ certify to best of my knowledge and  
Company

belief that this business meets Emerging Small Business definition as indicated in Article 9 and  
that information contained in this Emerging Small Business Report is true and correct.

\_\_\_\_\_  
Bidder's Signature

\_\_\_\_\_  
Date

Name of Bidding Firm: \_\_\_\_\_

**BID FORM**

**BID NO. 312001**

**PROJECT: LOCKS AND DAMS RENOVATION - PHASE 2 - LOCKS & DAMS  
UPGRADES  
BABCOCK AND LAFOLLETTE PARKS**

**TO: DANE COUNTY DEPARTMENT OF PUBLIC WORKS, HIGHWAY &  
TRANSPORTATION PROJECT ENGINEER  
1919 ALLIANT ENERGY CENTER WAY  
MADISON, WISCONSIN 53713**

**BASE BID - LUMP SUM:**

Phase 2 of this 2 phase project will repair, replace or modify structural, mechanical, electrical & controls components of existing locks & dams on the Yahara River. A separate, earlier and concurrent Phase 1 project will repair deteriorated concrete & modify existing structures at these facilities. The undersigned, having examined the site where the Work is to be executed and having become familiar with local conditions affecting the cost of the Work and having carefully examined the Drawings and Specifications, all other Construction Documents and Addenda thereto prepared by Dane County Department of Public Works, Highway & Transportation hereby agrees to provide all labor, materials, equipment and services necessary for the complete and satisfactory execution of the entire Work, as specified in the Construction Documents, for the Base Bid stipulated sum of:

\_\_\_\_\_ and \_\_\_\_\_/100 Dollars  
Written Price

\$ \_\_\_\_\_  
Numeric Price

The undersigned agrees to add the alternate(s) portion of the Work as described, for the following addition(s) to or subtraction(s) from the Base Bid, as stipulated below.

**ALTERNATE BID 1 - LUMP SUM:**

Add price for providing new remote operation controls and associated gate height monitoring cameras on two of the four weir gates at Babcock dam.

\_\_\_\_\_ and \_\_\_\_\_/100 Dollars  
Written Price

\$ \_\_\_\_\_  
Numeric Price (circle: Add or Deduct)

**ALTERNATE BID 2 - LUMP SUM:**

Add price for providing new remote operation controls and associated gate height monitoring camera on one of the three weir gates at LaFollette dam.

\_\_\_\_\_ and \_\_\_\_\_ /100 Dollars  
Written Price

\$ \_\_\_\_\_  
Numeric Price (circle: Add or Deduct)

**ALTERNATE BID 3 - LUMP SUM:**

Add price for providing weir gate mechanization, remote operation controls & associated gate height monitoring camera on the third of the four weir gates at Babcock dam.

\_\_\_\_\_ and \_\_\_\_\_ /100 Dollars  
Written Price

\$ \_\_\_\_\_  
Numeric Price (circle: Add or Deduct)

**ALTERNATE BID 4 - LUMP SUM:**

Add price for providing weir gate mechanization, remote operation controls & associated gate height monitoring camera on the second of the three weir gates at LaFollette dam.

\_\_\_\_\_ and \_\_\_\_\_ /100 Dollars  
Written Price

\$ \_\_\_\_\_  
Numeric Price (circle: Add or Deduct)

**ALTERNATE BID 5 - LUMP SUM:**

Add price for providing fishing platform & walkway at Babcock Park.

\_\_\_\_\_ and \_\_\_\_\_ /100 Dollars  
Written Price

\$ \_\_\_\_\_  
Numeric Price (circle: Add or Deduct)

**ALTERNATE BID 6 - LUMP SUM:**

Add price for providing fishing platform & walkway at LaFollette Park.

\_\_\_\_\_ and \_\_\_\_\_ /100 Dollars  
Written Price

\$ \_\_\_\_\_  
Numeric Price (circle: Add or Deduct)

**ALTERNATE BID 7 - LUMP SUM:**

Add price for omitting refurbishing manual lock controls & outdoor control cabinet in Base Bid and instead provide hydraulic lock controls and associated control panel in new equipment shed at Babcock lock.

\_\_\_\_\_ and \_\_\_\_\_ /100 Dollars  
Written Price

\$ \_\_\_\_\_  
Numeric Price (circle: Add or Deduct)

**ALTERNATE BID 8 - LUMP SUM:**

Add price for omitting refurbishing manual lock controls & outdoor control cabinet in Base Bid and instead provide hydraulic lock controls and associated control panel in existing storage shed at LaFollette lock (refer especially to Sheet M-2 & Section 35 20 17).

\_\_\_\_\_ and \_\_\_\_\_ /100 Dollars  
Written Price

\$ \_\_\_\_\_  
Numeric Price (circle: Add or Deduct)

Receipt of the following addenda and inclusion of their provisions in this Bid is hereby acknowledged:

Addendum No(s). \_\_\_\_\_ through \_\_\_\_\_

Dated \_\_\_\_\_

Dane County Department Land & Water Resources / Parks Division must have this project completed by August 24, 2012. If there are extenuating circumstances that are weather or lakes conditions related, Dane County may extend the completion date if petitioned in writing by the Contractor and that petition is accepted by Dane County. Assuming this Work can be started by April 4, 2012, what dates can you commence and complete this job?

Commencement Date: \_\_\_\_\_ Completion Date: \_\_\_\_\_  
(final, not substantial)

I hereby certify that all statements herein are made on behalf of:

\_\_\_\_\_  
(Name of Corporation, Partnership or Person submitting Bid)

Select one of the following:

1. A corporation organized and existing under the laws of the State of \_\_\_\_\_, or
2. A partnership consisting of \_\_\_\_\_, or
3. A person conducting business as \_\_\_\_\_;

Of the City, Village, or Town of \_\_\_\_\_ of the State of \_\_\_\_\_.

I have examined and carefully prepared this Bid from the associated Construction Documents and have checked the same in detail before submitting this Bid; that I have full authority to make such statements and submit this Bid in (its) (their) (my) behalf; and that the said statements are true and correct. In signing this Bid, we also certify that we have not, either directly or indirectly, entered into any agreement or participated in any collusion or otherwise taken any action in restraint of free competition; that no attempt has been made to induce any other person or firm to submit or not to submit a Bid; that this Bid has been independently arrived at without collusion with any other bidder, competitor, or potential competitor; that this Bid has not been knowingly disclosed prior to the Bids Due Date to another bidder or competitor; that the above statement is accurate under penalty of perjury.

The undersigned further agrees to honor the Base Bid and the Alternate Bid(s) for 60 days from date of Award of Contract.

**SIGNATURE:** \_\_\_\_\_  
(Bid is invalid without signature)

Print Name: \_\_\_\_\_ Date: \_\_\_\_\_

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

Address: \_\_\_\_\_

Telephone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

Email Address: \_\_\_\_\_

Contact Person: \_\_\_\_\_

**THIS PAGE IS FOR BIDDERS' REFERENCE AND NEED NOT BE SUBMITTED WITH BID FORM.**

**BID CHECK LIST:**

These items **must** be included with Bid:

- |                                   |   |
|-----------------------------------|---|
| <input type="checkbox"/> Bid Form | <input type="checkbox"/> Fair Labor Practices Certification                       |
| <input type="checkbox"/> Bid Bond | <input type="checkbox"/> Project Listing (Instructions to Bidders, Section 4.A.4) |

**BIDDERS SHOULD BE AWARE OF THE FOLLOWING:**

**DANE COUNTY VENDOR REGISTRATION PROGRAM**

Any person bidding on any County contract must be registered with the Dane County Purchasing Division & pay an annual registration fee. A contract will not be awarded to an unregistered vendor. Obtain a *Vendor Registration Form* by calling 608/266-4131 or complete a new form or renewal one online at:  
[www.danepurchasing.com/registration](http://www.danepurchasing.com/registration)

**DANE COUNTY BEST VALUE CONTRACTING PRE-QUALIFICATION**

Contractors must be pre-qualified as a Best Value Contractor with the Dane County Public Works Engineering Division before the award of contract. Obtain a *Best Value Contracting Application* by calling 608/266-4018 or complete one online at:  
[http://www.countyofdane.com/pwht/BVC\\_Application.aspx](http://www.countyofdane.com/pwht/BVC_Application.aspx)

**EQUAL BENEFITS REQUIREMENT**

By submitting a Bid, the contractor acknowledges that a condition of this contract is to provide equal benefits as required by Dane County Code of Ordinances Chapter 25.016. Contractor shall provide equal benefits as required by that Ordinance to all required employees during the term of the contract. For more information:  
[www.danepurchasing.com/partner\\_benefit.aspx](http://www.danepurchasing.com/partner_benefit.aspx)

## FAIR LABOR PRACTICES CERTIFICATION

The undersigned, for and on behalf of the BIDDER, APPLICANT or PROPOSER named herein, certifies as follows:

- A. That he or she is an officer or duly authorized agent of the above-referenced BIDDER, APPLICANT or PROPOSER, which has submitted a proposal, bid or application for a contract with the county of Dane.
  
- B. That BIDDER, APPLICANT or PROPOSER has (check one):

\_\_\_\_\_ not been found by the National Labor Relations Board (“NLRB”) or the Wisconsin Employment Relations Commission (“WERC”) to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

\_\_\_\_\_ been found by the National Labor Relations Board (“NLRB”) or the Wisconsin Employment Relations Commission (“WERC”) to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

\_\_\_\_\_  
Officer or Authorized Agent Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed or Typed Name and Title

\_\_\_\_\_  
Printed or Typed Business Name

**NOTE:** You can find information regarding the violations described above at: [www.nlr.gov](http://www.nlr.gov) and [werc.wi.gov](http://werc.wi.gov).

For reference, Dane County Ordinance 25.11(28)(a) is as follows:

(28) BIDDER RESPONSIBILITY. (a) Any bid, application or proposal for any contract with the county, including public works contracts regulated under chapter 40, shall include a certification indicating whether the bidder has been found by the National Labor Relations Board (NLRB) or the Wisconsin Employment Relations Committee (WERC) to have violated any statute or regulation regarding labor standards or relations within the last seven years. The purchasing manager shall investigate any such finding and make a recommendation to the committee, which shall determine whether the conduct resulting in the finding affects the bidder’s responsibility to perform the contract.

**If you indicated that the NLRB or WERC have found you to have such a violation, you must include copies of any relevant information regarding such violation with your proposal, bid or application.**





# DANE COUNTY DEPARTMENT of PUBLIC WORKS, HIGHWAY and TRANSPORTATION

County Executive  
Joseph T. Parisi

1919 Alliant Energy Center Way • Madison, Wisconsin 53713  
Phone: (608) 266-4018 • FAX: (608) 267-1533

Commissioner / Director  
Gerald J. Mandli

## BEST VALUE CONTRACTING APPLICATION

### CONTRACTORS / LICENSURE APPLICANTS

The Dane County Department of Public Works requires all contractors to be pre-qualified as a best value contractor with the County prior to being awarded a contract. In addition, the County pre-qualifies potential contractors and sub-contractors who wish to work on County contracts. Subcontractors must become pre-qualified ten (10) days prior to commencing work under any Dane County Public Works Contract. Potential subcontractors are urged to become pre-qualified as early as possible. This document shall be completed, properly executed, along with the necessary attachments and additional information that the County requires for the protection and welfare of the public in the performance of a County contract.

Contractors or subcontractors of any tier who attain pre-qualification status will retain that status for a period of two (2) years from the date of qualification. Contractors shall notify the Dane County Department of Public Works, Highway & Transportation within 15 days of any changes to its business or operations that are relevant to the pre-qualification application. Failure to do so could result in suspension, revocation of the contractor's pre-qualification, debarment from County contracts for up to three years and / or other sanctions available under the law.

No contracts will be awarded for construction work performed on Dane County projects unless the contractor is currently approved as a Wisconsin Trade Trainer or has applied for approval as an Apprenticeship Trade Trainer to the Wisconsin Department of Workforce Development and agrees to an acceptable apprenticeship program. If you are not currently approved as a Wisconsin Trade Trainer, or have not applied for approval as an Apprenticeship Trade Trainer, please contact the Department of Workforce Development - Bureau of Apprenticeship Standards at 608/266-3133 or visit their web site at: [dwd.wisconsin.gov/apprenticeship/](http://dwd.wisconsin.gov/apprenticeship/).

### EXEMPTIONS

- Contractors or subcontractors of any tier attain pre-qualification status with Dane County if the contractor has current Executive Order 108 precertification status with the State of Wisconsin.
- Contractors who employ less than five (5) apprenticeable trade workers are not required to pre-qualify.
- Contractors performing work that does not apply to an apprenticeable trade, as outlined in Appendix A.
- The contractor / subcontractor provides sufficient documentation to demonstrate one or more of the following:
  - apprentices are not available in a specific geographic area;
  - the applicable apprenticeship program is unsuitable or unavailable; or
  - there is a documented depression of the local construction market which prevents compliance.

SEC.	PROOF OF RESPONSIBILITY	CHECK IF APPLICABLE
1	Does your firm possess all technical qualifications and resources, including equipment, personnel and financial resources, necessary to perform the work required for any project or obtain the same through the use of responsible, pre-qualified subcontractors?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
2	Will your firm possess all valid, effective licenses, registrations or certificates required by federal, state, county, or local law, which are necessary for the type of work to be performed including, but not limited to, those for any type of trade work or specialty work?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
3	Will your firm meet all bonding requirements as required by applicable law or contract specifications?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
4	Will your firm meet all insurance requirements as required by applicable law or specifications, including general liability insurance, workers compensation insurance and unemployment insurance requirements?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
5	Will your firm maintain a substance abuse policy for employees hired for public works contracts that comply with Wis. Stats. Sec. 103.503?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
6	Does your firm acknowledge that it must pay all craft employees on public works projects the wage rates and benefits required under Section 66.0903 of the Wisconsin Statutes?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
7	Will your firm fully abide by the equal opportunity and affirmative action requirements of all applicable laws, including County ordinances?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
8	In the past three (3) years, has your firm had control or has another corporation, partnership or other business entity operating in the construction industry controlled it? If so, please attach a statement explaining the nature of the firm relationship?	Yes: <input type="checkbox"/> No: <input type="checkbox"/> If Yes, attach details.
9	In the past three (3) years, has your firm had any type of business, contracting or trade license, certification or registration revoked or suspended?	Yes: <input type="checkbox"/> No: <input type="checkbox"/> If Yes, attach details.
10	In the past three (3) years, has your firm been debarred by any federal, state or local government agency?	Yes: <input type="checkbox"/> No: <input type="checkbox"/> If Yes, attach details.
11	In the past three (3) years, has your firm defaulted or failed to complete any contract?	Yes: <input type="checkbox"/> No: <input type="checkbox"/> If Yes, attach details.
12	In the past three (3) years, has your firm committed a willful violation of federal, state or local government safety laws as determined by a final decision of a court or government agency authority.	Yes: <input type="checkbox"/> No: <input type="checkbox"/> If Yes, attach details.
13	In the past three (3) years, has your firm been in violation of any law relating to your contracting business where the penalty for such violation resulted in the imposition of a penalty greater than \$10,000?	Yes: <input type="checkbox"/> No: <input type="checkbox"/> If Yes, attach details.
14	Is your firm Executive Order 108 precertified with the State of Wisconsin?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
15	Is your firm an active Wisconsin Trade Trainer as determined by the Wisconsin Bureau of Apprenticeship Standards and listed at: <a href="http://dwd.wisconsin.gov/apprenticeship/executive_order108.htm">dwd.wisconsin.gov/apprenticeship/executive_order108.htm</a> ?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
16	Is your firm exempt from being pre-qualified with Dane County?	Yes: <input type="checkbox"/> No: <input type="checkbox"/> If Yes, attach reason for exemption.
17	Does your firm acknowledge that in doing work under any County Public Works Contract, it will be required to use as subcontractors only those contractors that are also pre-qualified with the County or become so ten days prior to commencing work?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>

## SIGNATURE SECTION

Your firm's Officer, or the individual who would sign a bid and / or contract documents must sign this document.

I do hereby certify that all statements herein contained are true and correct to the best of my knowledge:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed or Typed Name and Title

NAME AND ADDRESS OF CONTRACTOR	
Name of Firm:	
Address:	
City, State, Zip:	
Telephone Number:	
Fax Number:	
E-mail Address:	

## REMEMBER!

Return all to forms and attachments, or questions to:

**JAN NEITZEL KNOX**  
**EMAIL: NEITZEL-KNOX@COUNTYOFDANE.COM**  
**OFFICE: (608)266-4029, FAX: (608)267-1533**

**DANE COUNTY DEPARTMENT OF PUBLIC WORKS,  
HIGHWAY & TRANSPORTATION  
1919 ALLIANT ENERGY CENTER WAY  
MADISON, WI 53713**

# APPENDIX A

## APPRENTICEABLE TRADES

Bricklayer  
Carpenter  
Cement Mason (Concrete Finisher)  
Cement Mason (Heavy Highway)  
Construction Craft Laborer  
Data Communications Installer  
Electrician  
Elevator Mechanic / Technician  
Environmental Systems Technician / HVAC Service Technician / HVAC Install & Service  
Glazier  
Heavy Equipment Operator / Operating Engineer  
Insulation Worker (Heat & Frost)  
Iron Worker (Assembler, Metal Buildings)  
Painter / Decorator  
Plasterer  
Plumber  
Roofer / Waterproofer  
Sheet Metal Worker  
Sprinkler Fitter  
Steamfitter (Service & Refrigeration)  
Taper & Finisher  
Telecommunications (Voice, Data & Video) Installer / Technician  
Tile Setter

**COUNTY OF DANE**

**PUBLIC WORKS CONTRACT**

Contract No. \_\_\_\_\_ Bid No. 312001

Authority: Res. \_\_\_\_\_, 2011-12

**THIS CONTRACT**, made and entered into as of the date by which authorized representatives of both parties have affixed their signatures, by and between the County of Dane (hereafter referred to as "COUNTY") and \_\_\_\_\_ (hereafter, "CONTRACTOR"), and

**WITNESSETH:**

**WHEREAS**, COUNTY, whose address is c/o Associate Public Works Director, 1919 Alliant Energy Center Way, Madison, WI 53713, desires to have CONTRACTOR provide Locks and Dams Renovation - Phase 2 - Locks & Dams Upgrades at the Dane County Babcock and LaFollette Parks ("the Project"); and

**WHEREAS**, CONTRACTOR, whose address is \_\_\_\_\_ is able and willing to construct the Project, in accordance with the Construction Documents;

**NOW, THEREFORE**, in consideration of the above premises and the mutual covenants of the parties hereinafter set forth, the receipt and sufficiency of which is acknowledged by each party for itself, COUNTY and CONTRACTOR do agree as follows:

1. CONTRACTOR agrees to construct, for the price of \$\_\_\_\_\_ the Project 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 Project in accordance with the conditions and prices stated in the Bid Form, General Conditions of Contract, the drawings which include all maps, plats, plans, and other drawings and printed or written explanatory matter thereof, and the specifications therefore as prepared by Graef (hereinafter referred to as "the Architect / Engineer"), and as enumerated in the Project Manual Document Index, all of which are made a part hereof and collectively evidence and constitute the Contract.
2. COUNTY agrees to pay the CONTRACTOR in current funds for the performance of the Contract subject to additions and deductions, as provided in the General Conditions of Contract, and to make payments on account thereof as provided in Article entitled, "Payments to Contractor" of the General Conditions of Contract.
3. During the term of this Contract, CONTRACTOR agrees to take affirmative action to ensure equal employment opportunities. The CONTRACTOR agrees in accordance with Wisconsin Statute 111.321 and Chapter 19 of the Dane County Code of Ordinances not to discriminate on the basis of age, race, ethnicity, religion, color, gender, disability, marital status, sexual orientation, national origin, cultural differences, ancestry, physical appearance, arrest record or conviction record, military participation or membership in the national guard, state defense force or any other reserve component of the military forces of the United States, or political beliefs.

Such equal opportunity shall include, but not be limited to, the following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, rates of pay, and any other form of compensation. CONTRACTOR agrees to post in conspicuous places, available to all employees and applicants for employment, notices setting forth the provisions of this paragraph.

**4.** CONTRACTOR shall file an Affirmative Action Plan with the Dane County Contract Compliance Officer in accord with Chapter 19 of the Dane County Code of Ordinances. CONTRACTOR must file such plan within fifteen (15) days of the effective date of this Contract. During the term of this Contract CONTRACTOR shall also provide copies of all announcements of employment opportunities to COUNTY'S Contract Compliance Office, and shall report annually the number of persons, by race, ethnicity, gender, and disability status, which apply for employment and, similarly classified, the number hired and number rejected.

**5.** During the term of this Contract, all solicitations for employment placed on CONTRACTOR'S behalf shall include a statement to the effect that CONTRACTOR is an "Equal Opportunity Employer."

**6.** CONTRACTOR agrees to comply with provisions of Chapter 25.016 of the Dane County Code of Ordinances, which pertains to domestic partnership benefits.

**7.** CONTRACTOR agrees to furnish all information and reports required by COUNTY'S Contract Compliance Officer as the same relate to affirmative action and nondiscrimination, which may include any books, records, or accounts deemed appropriate to determine compliance with Chapter 19, Dane County Code of Ordinances, and the provisions of this Contract.

**8.** CONTRACTOR agrees that all persons employed by CONTRACTOR or any subcontractor shall be paid no less than the minimum wage established under Chapter 40, Subchapter II, Dane County Code of Ordinances. CONTRACTOR agrees to abide by and comply with the provisions of Chapter 40, Subchapter II of the Dane County Code of Ordinances, and said Subchapter is fully incorporated herein by reference.

**9.** This Contract is intended to be a Contract solely between the parties hereto and for their benefit only. No part of this Contract shall be construed to add to, supplement, amend, abridge or repeal existing rights, benefits or privileges of any third party or parties including, but not limited to, employees of either of the parties.

**10.** The entire agreement of the parties is contained herein and this Contract supersedes any and all oral agreements and negotiations between the parties relating to the subject matter hereof. The parties expressly agree that the express terms of this Contract shall not be amended in any fashion except in writing, executed by both parties.

**11.** CONTRACTOR must be pre-qualified as a Best Value Contractor with Dane County Public Works Engineering Division before award of Contract. Subcontractors must be pre-qualified ten (10) days prior to commencing Work under this Contract.

**IN WITNESS WHEREOF**, COUNTY and CONTRACTOR, by their respective authorized agents, have caused this Contract and its Schedules to be executed, effective as of the date by which all parties hereto have affixed their respective signatures, as indicated below.

\* \* \* \* \*

**FOR CONTRACTOR:**

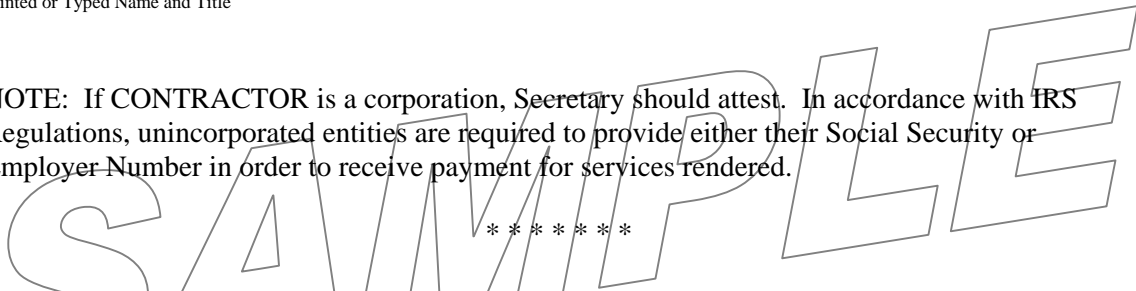
\_\_\_\_\_  
Signature Date

\_\_\_\_\_  
Printed or Typed Name and Title

\_\_\_\_\_  
Signature Date

\_\_\_\_\_  
Printed or Typed Name and Title

NOTE: If CONTRACTOR is a corporation, Secretary should attest. In accordance with IRS Regulations, unincorporated entities are required to provide either their Social Security or Employer Number in order to receive payment for services rendered.



\* \* \* \* \*

This Contract is not valid or effectual for any purpose until approved by the appropriate authority designated below, and no work is authorized until the CONTRACTOR has been given notice to proceed by COUNTY'S Associate Public Works Director.

**FOR COUNTY:**

\_\_\_\_\_  
Joseph T. Parisi, County Executive Date

\_\_\_\_\_  
Karen Peters, County Clerk Date

THE AMERICAN INSTITUTE OF ARCHITECTS



AIA Document A310

Bid Bond

Bond No.

KNOW ALL MEN BY THESE PRESENTS, that we (Here insert full name and address or legal title of Contractor)

as Principal, hereinafter called the Principal, and (Here insert full name and address or legal title of Surety)

a corporation duly organized under the laws of the State of WI as Surety, hereinafter called the Surety, are held and firmly bound unto (Here insert full name and address or legal title of Owner)

as Obligee, hereinafter called Obligee, in the sum of ( ) Percent of total amount bid Dollars (\$) Percent of attached bid.

For the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for Project No.: (Here insert full name, address, and description of project)

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this day of , 20 .

(Witness) (Principal) (Seal) (Title) (Surety) (Seal) (Witness) ATTORNEY-IN-FACT



THE AMERICAN INSTITUTE OF ARCHITECTS



Bond No. \_\_\_\_\_

AIA Document A312

Performance Bond

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

CONTRACTOR (Name and Address): \_\_\_\_\_

SURETY (Name and Principal Place of Business): \_\_\_\_\_

OWNER (Name and Address): \_\_\_\_\_

CONSTRUCTION CONTRACT  
Date: \_\_\_\_\_  
Amount: \$ \_\_\_\_\_  
Description (Name and Location): \_\_\_\_\_

BOND

Date (Not earlier than Construction Contract Date): \_\_\_\_\_

Amount: \$ \_\_\_\_\_

Modifications to this Bond: \_\_\_\_\_

None

See Page 3

CONTRACTOR AS PRINCIPAL  
COMPANY: \_\_\_\_\_  
(Corporate Seal)

SURETY COMPANY: \_\_\_\_\_  
(Corporate Seal)

Signature: \_\_\_\_\_  
Name and Title:

Signature: \_\_\_\_\_  
Name and Title:

Attorney-in-Fact

(Any additional signatures appear on page 3)

FOR INFORMATION ONLY-Name, Address and Telephone  
AGENT OR BROKER: \_\_\_\_\_

OWNER'S REPRESENTATIVE (Architect,  
Engineer or other party): \_\_\_\_\_

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except to participate in conferences as provided in Subparagraph 3.1.

3. If there is no Owner Default, the Surety's obligation under this Bond shall arise after:

3.1 The Owner has notified the Contractor and the Surety at its address described in Paragraph 10 below that the Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Construction Contract. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default; and

3.2 The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the contract. Such Contractor Default shall not be declared earlier than twenty days after the Contractor and the Surety have received notice as provided in Subparagraph 3.1; and

3.3 The Owner has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract or to a contractor selected to perform the Construction Contract in accordance with the terms of the contract with the Owner.

4. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

4.1 Arrange for the Contractor, with consent of the Owner, to perform and complete the Construction Contract; or

4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or

4.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and the contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default; or

4.4 Waive its rights to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

1. After investigation, determine the amount for

which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner; or

2. Deny liability in whole or in part and notify the Owner citing reasons therefor.

5. If the Surety does not proceed as provided in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph 4.4, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

6. After the Owner has terminated the Contractor's right to complete the Construction Contract, and if the Surety elects to act under Subparagraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:

6.1 The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

6.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 4; and

6.3 Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

7. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, or successors.

8. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

**12 DEFINITIONS**

12.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other

claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

12.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

12.3 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

12.4 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

**MODIFICATIONS TO THIS BOND ARE AS FOLLOWS:**

SAMPLE

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL  
Company: (Corporate Seal)

SURETY  
Company: (Corporate Seal)

Signature: \_\_\_\_\_  
Name and Title:  
Address:

Signature: \_\_\_\_\_  
Name and Title:  
Address:

THE AMERICAN INSTITUTE OF ARCHITECTS



Bond No. \_\_\_\_\_

AIA Document A312

Payment Bond

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

CONTRACTOR (Name and Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

CONSTRUCTION CONTRACT  
Date:  
Amount: \$  
Description (Name and Location):

BOND

Date (Not earlier than Construction Contract Date):

Amount: \$

Modifications to this Bond:

None

See Page 6

CONTRACTOR AS PRINCIPAL  
COMPANY: (Corporate Seal)

SURETY COMPANY:  
(Corporate Seal)

Signature: \_\_\_\_\_  
Name and Title:

Signature: \_\_\_\_\_  
Name and Title:  
Attorney-in-Fact

(Any additional signatures appear on page 6)

FOR INFORMATION ONLY-Name, Address and Telephone  
AGENT OR BROKER:

OWNER'S REPRESENTATIVE (Architect,  
Engineer or other party):

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference.
2. With respect to the Owner, this obligation shall be null and void if the Contractor:
  - 2.1 Promptly makes payment, directly, or indirectly, for all sums due Claimants, and
  - 2.2 Defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity whose claim, demand, lien or suit is for the payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.
4. The Surety shall have no obligation to Claimants under this Bond until:
  - 4.1 Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
  - 4.2 Claimants who do not have a direct contract with the Contractor:
    1. Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and
    2. Have either received a rejection in whole or in part from the Contractor, or not received within 30 days of furnishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly; and
    3. Not having been paid within the above 30 days, have sent a written notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.
5. If a notice required by Paragraph 4 is given by the Owner to the Contractor or to the Surety, that is sufficient compliance.
6. When the Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:
  - 6.1 Send an answer to the Claimant, with a copy to the Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
  - 6.2 Pay or arrange for payment of any undisputed amounts.
7. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
8. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any Construction Performance Bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
9. The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.
10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.
11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the work or part of the work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Subparagraph 4.1 or Clause 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
12. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by Surety, the Owner or the Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.
13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
14. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor

shall promptly furnish a copy of this Bond or shall permit a copy to be made.

**15. DEFINITIONS**

**15.1 Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's

subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

**15.2 Construction Contract:** The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

**15.3 Owner Default:** Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

**MODIFICATIONS TO THIS BOND ARE AS FOLLOWS:**

SAMPLE

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL  
Company: (Corporate Seal)

SURETY  
Company: (Corporate Seal)

Signature: \_\_\_\_\_  
Name and Title:  
Address:

Signature: \_\_\_\_\_  
Name and Title:  
Address:

# GENERAL CONDITIONS OF CONTRACT

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## **1. CONSTRUCTION DOCUMENTS**

- A. Construction Documents, listed in Table of Contents of this Specification volume shall form part of this Contract and provisions of Construction Documents shall be as binding upon parties as if they were fully set forth in Contract itself.
- B. These shall also be considered as part of Construction Documents: Addenda, including additions and modifications incorporated in such addenda before execution of Contract; requests for information; construction bulletins; change orders; and written interpretations by Architect / Engineer or Public Works Project Engineer that are made after execution of Contract.
- C. Construction Documents are complementary, and what is required by one shall be as binding as if required by all. Intent of Construction Documents is to include all labor, materials and equipment necessary for proper execution of the Work.

## **2. DEFINITIONS**

- A. These terms as used in this Contract are respectively defined as follows:
  - 1. All uses of term "County" in Construction Documents shall mean Dane County.
  - 2. All uses of term "Department" in Construction Documents shall mean Department of Public Works, Highway & Transportation, which is a unit of Dane County government. Department is County agency overseeing Contract with Contractor.
  - 3. Public Works Project Engineer is appointed by and responsible to Department. Public Works Project Engineer has authority to act on behalf of Department and will sign change orders, payment requests and other administrative matters related to projects.
  - 4. Public Works Project Engineer is responsible for supervision, administration and management of field operations involved in construction phase of this Work.
  - 5. Term "Work" includes all labor, equipment and materials necessary to produce project required by Construction Documents.
  - 6. Term "Substantial Completion" is date when project or specified area of project is certified by Architect / Engineer that construction is sufficiently completed, in accordance with Construction Documents, and as modified by any subsequent changes agreed to by parties, so that County may occupy project or specified area of project for use for which it was intended subject to permit approval for occupancy.
  - 7. Contractor is person, firm, or corporation with whom County makes Contract. Though multiple contracts may be involved, Construction Documents treat them throughout as if each were of singular number.

## **3. ADDITIONAL INSTRUCTIONS AND DRAWINGS**

- A. Contractor may be furnished additional instructions and detail drawings as necessary to carry out the Work included in Contract. Additional drawings and instructions thus supplied to Contractor will coordinate with Construction Documents and will be so prepared that they can be reasonably interpreted as part thereof. Contractor shall carry out the Work in accordance with additional detail drawings and instructions.



#### **4. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES**

- A. Unless otherwise specified, Contractor shall submit three (3) copies of all Shop Drawings for each submission, until receiving final approval. After final approval, provide five (5) additional copies for distribution and such other copies as may be required.
- B. Contractor shall submit, on an on-going basis and as directed, Product Data such as brochures that shall contain catalog cuts and specifications of all furnished mechanical and electrical equipment. After Architect / Engineer's approval, one (1) copy shall remain in Architect / Engineer's file, one (1) kept at Department's office and one (1) kept at job site by Contractor for reference purposes.
- C. Samples shall consist of physical examples furnished by Contractor in sufficient size and quantity to illustrate materials, equipment or workmanship, and to establish standards to compare the Work.
  - 1. Submit Samples in sufficient quantity (minimum of two (2)) to permit Architect / Engineer to make all necessary tests and of adequate size showing quality, type, color range, finish, and texture. Label each Sample stating material, type, color, thickness, size, project name, and Contractor's name.
  - 2. Submit transmittal letter requesting approval, and prepay transportation charges to Architect / Engineer's office on samples forwarded.
  - 3. Materials installed shall match approved Samples.
- D. Contractor shall review Shop Drawings and place their dated stamp thereon to evidence their review and approval and shall submit with reasonable promptness and in orderly sequence to cause no delay in the Work or in work of any other contractor. At time of submission, Contractor shall inform Architect / Engineer in writing of any deviation in Shop Drawings or Samples from requirements of Construction Documents. Architect / Engineer will not consider partial lists.
- E. Architect / Engineer will review and approve or reject Shop Drawings with reasonable promptness to cause no delay. Architect / Engineer's approval shall not relieve Contractor from responsibility for errors or omission in Shop Drawings.
- F. Contractor shall not commence any work requiring Shop Drawing, Product Data or Sample submission until Architect / Engineer has approved submission. All such work shall be in accordance with approved Shop Drawings, Product Data and Samples.
- G. Contractor shall keep on site of the Work, approved or conformed copy of Shop Drawings and shall at all time give Department access thereto.
- H. By stamping and submitting Shop Drawings, Product Data and Samples, Contractor thereby represents that he or she has or will determine and verify all field measurements, field construction criteria, materials, catalog numbers, and similar data and that he or she has checked and coordinated each Shop Drawing, Product Data and Sample with requirements of the Work and of Construction Documents. Architect / Engineer shall return without examination, Shop Drawings, Product Data and Samples not so noted.
- I. All Shop Drawings from any one Contractor should be numbered consecutively and on cover sheet shall bear name and location of project, name of Contractor, date of submittal and date of each correction or revision and associated Specification section and page number.

#### **5. CUTTING AND PATCHING**

- A. Contractor shall be responsible for all cutting, fitting or patching required to complete the Work or to make its parts fit together properly.
- B. Contractor shall not damage or endanger portion of the Work or fully or partially completed construction of County or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. Contractor shall not cut or otherwise alter such construction by County or separate contractor except with written consent of County and of such separate contractor; such consent shall not be unreasonably withheld. Contractor shall not withhold unreasonably from County or separate contractor, Contractor's consent to cutting or otherwise altering the Work.

## **6. CLEANING UP**

- A. Contractor shall keep premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under Contract. Contractor shall remove from and about the Work waste materials, rubbish, Contractor's tools, construction equipment, machinery, and surplus materials at completion of the Work. Contractor shall maintain streets and sidewalks around the Work site in clean condition. Contractor shall remove all spillage and prevent tracking of spillage arising from performance of the Work, into, out of, and within the Work site. Contractor shall establish regular maintenance program of sweeping, vacuuming and / or hosing to minimize accumulation of dirt and dust upon such areas.
- B. If Contractor fails to clean up as directed in Construction Documents, County may do so and shall charge Contractor cost thereof.
- C. Contractor shall be responsible for broken windows and glass, and at completion of the Work shall replace such damaged or broken windows and glass. After replacing damaged or broken windows and glass, Contractor shall remove all labels, wash and polish both sides of all windows and glass.
- D. In addition to general cleaning (sweeping, vacuuming and / or hosing, as is appropriate to work surface), Contractor shall perform following final cleaning for all trades at completion of the Work:
  - 1. Remove temporary protections;
  - 2. Remove marks, stains, fingerprints and other soil or dirt from painted, decorated and finished woodwork and wall surfaces;
  - 3. Remove spots, plaster, soil and paint from ceramic tile, marble and other finished materials, and wash or wipe clean;
  - 4. Clean fixtures, cabinet work and equipment, removing stains, paint, dirt and dust, and leave same in undamaged, new condition;
  - 5. Clean aluminum in accordance with recommendations of manufacturer; and
  - 6. Clean resilient floors thoroughly with well-rinsed mop containing only enough moisture to clean off any surface dirt or dust and buff dry by machine to bring surfaces to sheen.

## **7. USE OF SITE**

- A. Contractor shall provide County and Architect / Engineer access to the Work under all circumstances.

- B. Contractor shall confine operations at site to areas permitted by County, law, ordinance, permits and Construction Documents and shall not unreasonably encumber site with materials or equipment. Contractor shall assure free, convenient, unencumbered, direct and safe access to all properties adjacent to the Work for County, its employees, invitees and guests.

## **8. MATERIALS AND WORKMANSHIP**

- A. Contractor shall perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, necessary to complete the Work required by this Contract, within time specified, in accordance with provisions of Construction Documents.
- B. All equipment and materials incorporated in the Work covered by this Contract are to be new; use recycled and / or recovered materials to extent that such use is technically and economically feasible. Recovered materials are products recovered from solid waste in form identical to original form for use that is same as, or similar to original use. Recycled materials are products manufactured from solid waste.
- C. If requested, Contractor shall furnish satisfactory evidence as to kind and quality of construction materials proposed or used. Contractor shall furnish to Architect / Engineer, for approval, manufacturer name and model, performance capacities and other pertinent information of machinery, mechanical, electrical or other types of equipment, which Contractor plans to install.
- D. If not otherwise provided, materials and labor called for in this Contract shall be provided and performed in accordance with established practice and standards recognized by Architects, Engineers, Department, and construction industry.
- E. Reference to "Standard" specifications of any association or manufacturer, or codes of County authorities, intends most recent printed edition or catalog in effect on date that corresponds with date of Construction Documents.
- F. Whenever reference is made in Specifications that work shall be "performed", "applied", in accordance with "manufacturer's directions or instructions", Contractor to whom those instructions are directed shall furnish three (3) printed copies of such instructions to Architect / Engineer before execution of the Work.

## **9. CONTRACTOR'S TITLE TO MATERIALS**

- A. Contractor or any subcontractor shall not purchase materials or supplies for the Work subject to any chattel mortgage or under conditional sale contract or other agreement by which seller retains interest. Contractor warrants that all materials and supplies used in the Work are free from all liens, claims or encumbrances and Contractor has good title to them.

## **10. "OR EQUAL" CLAUSE**

- A. Whenever equipment or materials are identified on Drawings or in Specifications by reference to manufacturer's or vendor's name, trade name, catalog number, and other identifying information, it is intended to establish standards; and any equipment or material of other manufacturers and vendors which will perform adequately duties imposed by general design will be considered equally accepted provided equipment or material so proposed is, in opinion of Architect / Engineer, of equal substance and function. Architect / Engineer and Department shall provide written approval before Contractor may purchase or install it.

- B. Equipment or materials of manufacturers, other than those named, may be used only upon following conditions:
1. That, in opinion of Architect / Engineer and Department, proposed material or equipment item is fully equal or superior (in design, materials, construction, workmanship, performance, finish, etc.) to named item. No compromise in quality level, however small, is acceptable.
  2. That, in substituting materials or equipment, Contractor assumes responsibility for any changes in system or for modifications required in adjacent or related work to accommodate such substitution despite Architect / Engineer's and Department's approval, and all costs growing out of approval of "or equal" items shall be responsibility of Contractor. No extra costs resulting from such approval shall become responsibility of Department, Architect / Engineer or any other separate Contractor.
  3. It shall be understood that use of materials or equipment other than those specified, or approved equal by Architect / Engineer and Department, shall constitute violation of Contract, and that Architect / Engineer and Department shall have right to require removal of such materials or equipment and their replacement with specified materials or equipment at Contractor's expense.
  4. Product and manufacturer named first in Specifications or on information shown on Drawings is basis of selection of manufactured items and equipment, particularly mechanical equipment. In using other than first named products or manufacturers, including those specified as additionally approved or acceptable, Contractor assumes responsibility for any changes in system and for modifications in any work required to accommodate them. Architect / Engineer's approval of such additionally acceptable products or manufacturers, either in Specifications or in Addendum, does not relieve Contractor from obligation to coordinate such optional products with other Contractors, whose work may be affected by them, and to pay all additional costs resulting from their inclusion into the Work. Contractor's liability shall include payment of Architect / Engineer's fees for any additional services made necessary by or directly connected to such product changes. No extra costs resulting from such changes shall become responsibility of Department, Architect / Engineer or any other separate Contractor.
- C. No request for approval of "or equal" materials will be entertained except from Contractor. Identify any request for substitution as substitution on Contractor's letter of transmittal and give reasons for substitution. Department may in its sole discretion allow substitutions of materials.

## **11. PATENTS AND ROYALTIES**

- A. If Contractor uses any design, device or material covered by letters, patent or copyright, it is mutually agreed and understood, that, without exception, contract prices shall include all royalties or costs arising from use of such design, device or materials, in any way involved in the Work.
- B. Contractor shall indemnify and save harmless County from any and all claims for infringement by reason of use of such patent or copyright in connection with the Work agreed to be performed under this Contract, and shall indemnify County for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during prosecution of the Work or after completion of the Work.

## **12. SURVEYS, PERMITS, REGULATIONS AND TAXES**

- A. Department will furnish to Contractor all site, topography and property surveys necessary for execution of the Work.
- B. Contractor shall procure all permits, licenses and approvals necessary for execution of this Contract.
- C. Contractor shall give all notices and comply with all State of Wisconsin, Federal and local laws, codes, rules and regulations relating to performance of the Work, protection of adjacent property, and maintenance of passageways, guard fences or other protective facilities.
- D. Contractor shall pay all Sales, Consumer, Use and other similar taxes required by law.
- E. Contractor shall promptly notify Architect / Engineer of any variances of Drawings or Specifications with that of any State of Wisconsin, federal or local law, code, rule or regulation. Upon such notification, Architect / Engineer will require correction of variance to comply with applicable law, code, rule or regulation at no additional cost to Contractor.
- F. Work under this Contract shall comply with all applicable State of Wisconsin, Federal and local laws, codes and regulations.
- G. Contractor shall pay charges for water, sewer and other utility connections made by municipalities where required by Specifications.

## **13. CONTRACTOR'S OBLIGATIONS AND SUPERINTENDENCE**

- A. Contractor shall provide and pay for all materials, labor, tools, equipment, transportation and superintendence necessary to execute, complete and deliver the Work within specified time. Contractor agrees to secure at their own expense all personnel necessary to carry out the Work. Such personnel shall not be deemed County employees nor shall they have or be deemed to have any direct contractual relationship with County.
- B. Performance of any work necessary after regular working hours, on Sundays or Legal Holidays shall be without additional expense to County. Performance of any work at site at other than normal working hours must be coordinated with Public Works Project Engineer.
- C. Contractor shall furnish, erect, maintain and remove such temporary works as may be required.
- D. Contractor shall observe, comply with, and be subject to all terms, conditions, requirements and limitations of Construction Documents.
- E. At the Work site, Contractor shall give personal superintendence to the Work or shall employ construction superintendent or foreman, experienced in character of work covered by Contract, who shall have full authority to act for Contractor. Understand that such superintendent or foreman shall be acceptable to Architect / Engineer and Department.
- F. Remove from project or take other corrective action upon notice from Architect / Engineer or Department for Contractor's employees whose work is considered by Architect / Engineer or Department to be unsatisfactory, careless, incompetent, unskilled or otherwise objectionable.

- G. Contractor and subcontractors shall be required to conform to Labor Laws of State of Wisconsin and various acts amendatory and supplementary thereto and to other laws, ordinances and legal requirements applicable to the Work.
- H. Presence and observation of the Work by Architect / Engineer or Public Works Project Engineer shall not relieve Contractor of any obligations.

#### **14. WEATHER CONDITIONS**

- A. In event of temporary suspension of work, or during inclement weather, or whenever Architect / Engineer shall direct, Contractor shall, and shall cause subcontractors to protect carefully all work and materials against damage or injury from weather. If, in opinion of Architect / Engineer or Department, any work or materials that have been damaged or injured due to failure on part of Contractor or any subcontractors so to protect the Work, such materials shall be removed and replaced at expense of Contractor.

#### **15. PROTECTION OF WORK AND PROPERTY**

- A. Contractor shall at all times safely guard County's property from injury or loss in connection with this Contract. Contractor shall at all times safely guard and protect the Work, and adjacent property, from damage. Contractor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in Contract, or by County, or County's duly authorized representative.
- B. Contractor may act diligently, without previous instructions from Architect / Engineer and / or Department, in emergency that threatens loss or injury of property, or safety of life. Contractor shall notify Architect / Engineer and / or Department immediately thereafter. Promptly submit any claim for compensation by Contractor due to such extra work to Architect / Engineer and / or Department for approval as provided for in Article 18 herein.

#### **16. INSPECTION AND TESTING OF MATERIALS**

- A. Authorized representatives and agents of County government shall have access at all times to the Work wherever it is in preparation or progress and Contractor shall provide facilities for such access and for inspection.
- B. Should it be considered necessary or advisable at any time before final acceptance of the Work to make examination of work already completed, by removing or tearing out same, Contractor shall upon request, promptly furnish all necessary facilities, labor and materials. If such work is found to be defective in any aspect, due to fault of Contractor or subcontractors thereof, Contractor shall assume all expenses of such examination and of satisfactory reconstruction. Contractor will be reimbursed for such examination and replacement in accordance with Article 18 - A.3., of these General Conditions of Contract if such work is found to meet requirements of Contract.
- C. If Specifications, Architect / Engineer's, or Public Works Project Engineer's instructions require any work to be specially tested or approved, Contractor shall give Architect / Engineer and Public Works Project Engineer timely notice of its readiness for testing or inspection. Test all materials and equipment requiring testing in accordance with accepted or specified standards, as applicable. Architect / Engineer shall recommend laboratory or inspection agency and Department will select and pay for all initial laboratory inspection

services. Should retesting be required, due to failure of initial testing, cost of such retesting shall be borne by Contractor.

- D. Cost of any testing performed by manufacturers or Contractor for substantiating acceptability of proposed substitution of materials and equipment, or necessary conformance testing in conjunction with manufacturing processes or factory assemblage, shall be borne by Contractor or manufacturer responsible.

## **17. REPORTS, RECORDS AND DATA**

- A. Contractor shall submit to Architect / Engineer and Public Works Project Engineer such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, invoices, records and other data as either may request concerning work performed or to be performed under this Contract.

## **18. CHANGES IN THE WORK**

- A. Make no changes, except in cases of emergency, in the Work covered by approved Construction Documents without having prior written approval of Department. Charges or credits for the Work covered by approved change shall be determined by one of these methods:
1. Unit bid prices previously approved.
  2. Agreed lump sum based on actual cost of:
    - a) Labor, including foremen, and all fringe benefits that are associated with their wages.
    - b) Materials entering permanently into the Work.
    - c) Ownership or rental cost of construction tools and equipment during time of use on extra work.
    - d) Power and consumable supplies for operation of power equipment.
    - e) Workmen's Compensation Insurance, Contractor's Public Liability and Property Damage Insurance, and Comprehensive Automobile Liability Insurance.
    - f) Social Security and old age and unemployment contributions.
    - g) Add to cost under (2), fixed fee to be agreed upon, but not to exceed fifteen percent (15%) of actual cost of work performed with their own labor force. Fee shall be compensation to cover cost of supervision, overhead, bond, profit and any other general expense.
    - h) On that portion of the Work under (2) done under subcontract, Contractor may include not over seven and one-half percent (7½%) for supervision, overhead, bond, profit and any other general expense.
    - i) Department may require correct amount of costs with supporting vouchers; Contractor shall keep and present in such form as directed.
  3. Cost-plus work, with not-to-exceed dollar limit, based on actual cost of:
    - a) Labor, including foremen, and all fringe benefits that are associated with their wages.
    - b) Materials entering permanently into the Work.
    - c) Ownership or rental cost of construction tools and equipment during time of use on extra work. Rental cost cannot exceed fifty percent (50%) replacement value of rented equipment.
    - d) Power and consumable supplies for operation of power equipment.
    - e) Workmen's Compensation Insurance, Contractor's Public Liability and Property Damage Insurance, and Comprehensive Automobile Liability Insurance.
    - f) Social Security and old age and unemployment contributions.
    - g) To cost under (3), there shall be added fixed fee to be agreed upon but not to exceed fifteen percent (15%) of actual cost of work performed with their own labor force.

Fee shall be compensation to cover cost of supervision, overhead, bond, profit, and any other general expense.

- h) On that portion of the Work under (3) done under subcontract, Contractor may include not over seven and one-half percent (7½%) for supervision, overhead, bond, profit, and any other general expense.
  - i) Contractor shall keep and present, in such form as directed, correct amount of cost together with such supporting vouchers as may be required by Department.
- B. If Contractor claims that by any instructions given by Architect / Engineer, Department, by drawings or otherwise, regarding performance of the Work or furnishing of material under Contract, involves extra cost, Contractor shall give Department written notice of cost thereof within two (2) weeks after receipt of such instructions and in any event before proceeding to execute work, unless delay in executing work would endanger life or property.
- C. No claim for extra work or cost shall be allowed unless it was done in pursuance of written Change Order from Architect / Engineer and approved by Department, as previously mentioned, and claim presented with payment request submitted after changed or extra work is completed.
- D. Negotiation of cost for change in the Work shall not be cause for Contractor to delay prosecution of the Work if Contractor has been authorized in writing by Public Works Project Engineer to proceed.

## **19. EXTRAS**

- A. Without invalidating Contract, Department may order extra work or make changes by altering, adding to or deducting from the Work, contract sum being adjusted in accordance with Article 18 herein.

## **20. TIME FOR COMPLETION**

- A. Contractor agrees that the Work shall be prosecuted regularly and diligently and complete the Work as stated in Construction Documents.

## **21. CORRECTION OF WORK**

- A. All work, all materials whether incorporated in the Work or not, and all processes of manufacture shall at all times and places be subject to inspection of Architect / Engineer and Public Works Project Engineer who shall be judge of quality and suitability of the Work, materials, and processes of manufacture for purposes for which they are used. Should they fail to meet Architect / Engineer's and Public Works Project Engineer's approval they shall be reconstructed, made good, replaced or corrected, by Contractor at Contractor's expense. Immediately remove all rejected material from site.
- B. If Contractor defaults or neglects to carry out the Work in accordance with Construction Documents or fails to perform any provision of Contract, Department may, after ten (10) days' written notice to Contractor and without prejudice to any other remedy County may have, make good such deficiencies. In such case, appropriate Change Order shall be issued deducting from Contractor's payments then or thereafter, cost of correcting such deficiencies, including cost of Architect / Engineer's additional services made necessary by such default, neglect or failure.



## **22. SUBSURFACE CONDITIONS FOUND DIFFERENT**

- A. If Contractor encounters subsurface or latent conditions at site materially differing from those shown on Drawings or indicated in Specifications, Contractor shall immediately give notice to Architect / Engineer and Public Works Project Engineer of such conditions before they are disturbed. Architect / Engineer will thereupon promptly investigate conditions, and if Architect / Engineer finds that they materially differ from those shown on Drawings or indicated in Specifications, Architect / Engineer will at once make such changes as necessary, any increase or decrease of cost resulting from such changes to be adjusted in manner provided in above Article 18 entitled "Changes in the Work".

## **23. RIGHT OF DEPARTMENT TO TERMINATE CONTRACT**

- A. In event that any provisions of this Contract are violated by Contractor or by any subcontractors, County may serve written notice upon Contractor and Surety of its intention to terminate Contract, such notice to contain reasons for such intention to terminate Contract, and unless within ten (10) days after serving of such notice upon Contractor, such violation or delay shall cease and satisfactory arrangement or correction be made, Contract shall, upon expiration of said ten (10) days, cease and terminate.
- B. In event of any such termination, County shall immediately serve notice thereof upon Surety and Contractor, and Surety shall have right to take over and perform Contract subject to County's approval; provided, however, that if Surety does not commence performance thereof within ten (10) days from date of mailing to such Surety of notice of termination, County may take over the Work and prosecute same to completion by contract, or by force account, at expense of Contractor; Contractor and Surety shall be liable to County for any excess cost occasioned County thereby, and in such event County may take possession of and utilize in completing the Work, such materials and equipment as may be on the Work site and therefore necessary.

## **24. CONSTRUCTION SCHEDULE AND PERIODIC ESTIMATES**

- A. Contractor shall be responsible for Construction Schedule and coordination. Immediately after execution and delivery of Contract and before making first payment, Contractor shall notify all subcontractors to furnish all required information to develop Construction Schedule. Contractor and all subcontractors associated with the Work shall furnish following information from each Division of Specifications:
1. List of construction activities;
  2. Start, finish and time required for completion of each activity;
  3. Sequential relationships between activities;
  4. Identify all long lead-time items, key events, meetings or activities such as required submittals, fabrication and delivery, procurement of materials, installation and testing;
  5. Weekly definition of extent of work and areas of activity for each trade or Subcontract; and
  6. Other information as determined by Public Works Project Engineer.
- B. In addition to above requested items, Contractor shall request delivery dates for all County-furnished equipment, materials or labor. This shall include any work handled by Department under separate contracts such as asbestos abatement, air and water balancing, etc. Indicate on Construction Schedule these associated delivery and installation dates.
- C. Progress Reporting:

1. Contractor shall update and publish Construction Schedule on monthly basis. Revisions to Schedule shall be by Contractor and made in same detail as original Schedule and accompanied by explanation of reasons for revision; and shall be subject to approval by Department.
  2. Failure of Contractor to keep Schedule in updated format shall result in County hiring firm specializing in construction schedule development and deducting those costs associated with updating process from payments due Contractor.
  3. Contractor shall submit show actual percentage of each activity completed, estimated future progress, and anticipated completion time.
- D. Responsibility for timely completion requires:
1. Contractor and subcontractors understand that performance of each is interdependent upon performance of others.
  2. Whenever it becomes apparent from current schedule, that phasing or progress completion dates will not be met, Contractor must take some or all following actions at no additional cost to County:
    - a) Increase construction manpower in such quantities and crafts as will eliminate backlog of work.
    - b) Increase number of working hours per shift, shifts per working day, working days per week, amount of construction equipment, or any combination of foregoing to eliminate backlog of work.
    - c) Reschedule work (yet remain in conformance with Drawings and Specifications).
  3. Prior to proceeding with any of above actions, Contractor shall notify Public Works Project Engineer.
- E. Maintain current Construction Schedule at all times. Revise Construction Schedule in same detail as original and accompany with explanation of reasons for revision. Schedule shall be subject to approval by Architect / Engineer and Public Works Project Engineer.

## **25. PAYMENTS TO CONTRACTOR**

- A. Contractor shall provide:
1. Detailed estimate giving complete breakdown of contract price by Specification Division; and
  2. Periodic itemized estimates of work done for purpose of making partial payments thereon.
- Submit these estimates for approval first to Architect / Engineer, then to Public Works Project Engineer. Costs employed in making up any of these schedules are for determining basis of partial payments and not considered as fixing basis for additions to or deductions from Contract price.
- B. County will make partial payments to Contractor for value, proportionate to amount of Contract, of all labor and material incorporated in the Work during preceding calendar month upon receipt of Application and Certificate for Payment form from Architect / Engineer and approval of Department.
- C. Contractor shall submit for approval first to Architect / Engineer, and then to Public Works Project Engineer all Application and Certificate for Payment forms. If requested, Application and Certificate for Payment shall be supported by such additional evidence as may be required, showing Contractor's right to payment claimed.
- D. Application and Certificate for Payment for preparatory work and materials delivered and suitably stored at site to be incorporated into the Work at some future period, will be given

due consideration. Requesting payment for materials stored off site, may be rejected, however, if deemed essential for reasons of job progress, protection, or other sufficient cause, requests will be considered, conditional upon submission by Contractor of bills of sale, photographs and such other procedures as will adequately protect County's interest such as storage in bonded warehouse with adequate coverage. If there is any error in payment, Contractor is obligated to notify Department immediately, but no longer than ten (10) days from receipt of payment.

- E. Payments by County will be due within forty-five (45) days after receipt by Department of Application and Certificate for Payment.
- F. County will retain five percent (5%) of each Application and Certificate for Payment until final completion and acceptance of all the Work covered by Contract. However, anytime after fifty percent (50%) of the Work has been furnished and installed at site, County will make remaining payments in full if Architect / Engineer and Public Works Project Engineer find that progress of the Work corresponds with Construction Schedule. If Architect / Engineer and Public Works Project Engineer find that progress of the Work does not correspond with Construction Schedule, County may retain up to ten percent (10%) of each Application and Certificate for Payment for the Work completed.
- G. All material and work covered by partial payments made shall become sole property of County, but this provision shall not be construed as relieving Contractor from sole responsibility for care and protection of materials and work upon which payments have been made, or restoration of any damaged work, or as waiver of right of County to require fulfillment of all of terms of Contract.
- H. County will make final payment within sixty (60) days after final completion of the Work, and will constitute acceptance thereof.
- I. County may make payment in full, including retained percentages and less authorized deductions, upon completion and acceptance of each Division where price is stated separately in Contract.
- J. Every contractor engaged in performance of any contract for Department of Public Works, Highway & Transportation shall submit to this Department, as requested and with final application for payment for work under said contract, affidavit(s) as required to prove that all debts and claims against this Work are paid in full or otherwise satisfied, and give final evidence of release of all liens against the Work and County. If Wisconsin Prevailing Wage Rate Determination is required for this Work, use "Prime Contractor Affidavit of Compliance With Prevailing Wage Rate Determination" and "Agent or Subcontractor Affidavit of Compliance With Prevailing Wage Rate Determination" (if applicable). If Wisconsin Prevailing Wage Rate Determination is not required for this Work, use "Dane County, Wisconsin Contractor Wage Affidavit". Forms of such affidavits are included in Supplementary Conditions.

## **26. WITHHOLDING OF PAYMENTS**

- A. County, after having served written notice on said Contractor, may either pay directly any unpaid bills of which Department has written notice, or withhold from Contractor's unpaid compensation sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged; whereupon, payment to Contractor shall be resumed in accordance with terms of this

Contract, but in no event shall these provisions be construed to impose any obligations upon County to either Contractor or Contractor's Surety.

- B. In paying any unpaid bills of Contractor, County shall be deemed agent of Contractor, and any payment so made by County, shall be considered as payment made under Contract by County to Contractor and County shall not be liable to Contractor for any such payment made in good faith.
- C. Contractor shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives from all claims growing out of lawful demands of subcontractors, laborers, workmen, mechanics, material men, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in performance of this Contract.
- D. At Department's request, Contractor shall furnish satisfactory evidence that all obligations of nature designated above have been paid, discharged or waived.

## **27. ACCEPTANCE OF FINAL PAYMENT AS RELEASE**

- A. Making of final payment shall constitute waiver of all claims by County except those arising from:
  - 1. Unsettled lien;
  - 2. Faulty or defective work appearing after substantial completion;
  - 3. Failure of the Work to comply with requirements of Construction Documents; or
  - 4. Terms of any special guarantees required by Construction Documents.
- B. Acceptance of final payment shall constitute waiver of all claims by Contractor.

## **28. PAYMENTS BY CONTRACTOR**

- A. Contractor shall pay following not later than fifth (5<sup>th</sup>) day following each payment received from County:
  - 1. All transportation and utility services rendered;
  - 2. All materials, tools, and other expendable equipment that have been delivered at site of the Work to extent of ninety percent (90%) of cost thereof, and balance of cost thereof when said balance is paid to Contractor; and
  - 3. Each subcontractor, respective amount allowed Contractor because of work performed by subcontractor to extent of subcontractor's interest therein.

## **29. CONTRACT SECURITY**

- A. Contractor shall furnish Performance and Payment Bonds in amount at least equal to one hundred percent (100%) of Contract price as security for faithful performance of this Contract and payment of all persons performing labor on project under this Contract and furnishing materials in connection with this Contract.
- B. Sample Performance and Payment Bonds that Contractor will be required to execute is bound into these Construction Documents. Before construction Contract is consummated, completed Performance and Payment Bonds must be approved by Department.

## **30. ASSIGNMENTS**

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

### **31. MUTUAL RESPONSIBILITY OF CONTRACTORS**

- A. If, through acts of neglect on part of Contractor or any subcontractor shall suffer loss or damage on the Work, Contractor agrees to settle with such subcontractor by agreement or arbitration if such other subcontractor will so settle. If such subcontractor shall assert any claim against County on account of any damage alleged to have been sustained, Department shall notify Contractor, who shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives against any such claim.

### **32. SEPARATE CONTRACTS**

- A. Department may award other contracts for the Work and all Contractors shall fully cooperate with each other and carefully adjust their work to that provided under other contracts as may be directed by Department. No Contractor shall commit or permit any act that will interfere with performance of the Work by any other Contractor.
- B. Contractor shall coordinate the Work with those of other Contractors. Cooperation will be required in arrangement for storage of materials and in detailed execution of the Work. Contractor, including subcontractors, shall keep informed of progress and detail work of others and shall notify Architect / Engineer or Department immediately of lack of progress or defective workmanship on part of others. Failure of Contractor to keep informed of the Work progressing on site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by Contractor of status of the Work as being satisfactory for proper coordination with Contractor's own work.

### **33. SUBCONTRACTS**

- A. Contractor may use services of specialty subcontractors on those parts of the Work that, under normal contracting practices, are performed by specialty subcontractors.
- B. Contractor shall not award any work to any subcontractor without prior approval of Department. Qualifications of subcontractors shall be same as qualifications of Contractor. Request for subcontractor approval shall be submitted to Department fifteen (15) days before start of subcontractor's work. If subcontractors are changed or added, Contractor shall notify Department in writing.
- C. Contractor shall be as fully responsible to County for acts and omissions of subcontractors, and of persons either directly or indirectly employed by them, as Contractor is for acts and omissions of persons directly employed by Contractor.
- D. Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the Work to bind subcontractors to Contractor by terms of General Conditions of Contract and

other Construction Documents insofar as applicable to work of subcontractors and to give Contractor same power as regards terminating any subcontract that Department may exercise over Contractor under any provision of Construction Documents.

- E. Nothing contained in this Contract shall create any contractual relation between any subcontractor and County.
- F. Contractor shall insert in all subcontracts, Articles 26, 33, 43 and 45, respectively entitled: “Withholding of Payments”, “Subcontracts”, “Affirmative Action Provision and Minority / Women / Disadvantaged Business Enterprises”, and “Minimum Wages”, and shall further require all subcontractors to incorporate physically these same Articles in all subcontracts.

#### **34. PUBLIC WORKS PROJECT ENGINEER’S AUTHORITY**

- A. Public Works Project Engineer shall:
  - 1. Administer and ensure compliance with Construction Documents;
  - 2. Provide responsible on-site observations of construction and have authority to request work and to stop work whenever necessary to insure proper enforcement of Construction Documents;
  - 3. Convene and chair project meetings and foreman’s coordination meetings when necessary to coordinate resolution of conflicts between Contractors, Architects, Engineers, Consultants, and Department; and
  - 4. Check and inspect material, equipment and installation procedures of all trades for proper workmanship and for compliance with Drawings, Specifications and Shop Drawings, permit no material on project site that is not satisfactory and reject work not in compliance with Construction Documents.

#### **35. ARCHITECT / ENGINEER’S AUTHORITY**

- A. Architect / Engineer is retained by, and is responsible to Department acting for County.
- B. Architect / Engineer shall determine amount, quality, acceptability, and fitness of several kinds of work and materials that are provided under this Contract and shall decide all questions that may arise in relation to said work and construction thereof.
- C. Architect / Engineer shall decide meaning and intent of any portion of Specifications and of any Drawings where they may be found obscure or be in dispute.
- D. Architect / Engineer shall provide responsible observation of construction. Architect / Engineer has authority to stop the Work whenever such stoppage may be necessary to insure proper execution of Construction Documents.
- E. Architect / Engineer shall be interpreter of conditions of Construction Documents and judge of its performance.
- F. Within reasonable time, Architect / Engineer shall make decisions on all matters relating to progress of the Work or interpretation of Construction Documents.
- G. Architect / Engineer’s decisions are subject to review by Public Works Project Engineer.

#### **36. STATED ALLOWANCES**

- A. Stated allowances enumerated in Instructions to Bidders shall cover net cost of materials or equipment, and all applicable taxes. Contractor's cost of delivery and unloading at site, handling costs on site, labor, installation costs, overhead, profit and any other incidental costs shall be included in Contractor's bid, but not as part of cash allowance.
- B. Department will solicit at least two (2) bids on materials or equipment for which allowance is stated and select on basis of lowest qualified responsible bid. Contractor will then be instructed to purchase "Allowed Materials". If actual price for purchasing "Allowed Materials", including taxes, is more or less than "Cash Allowance", Contract price shall be adjusted accordingly. Adjustment in Contract price shall not contain any cost items excluded from cash allowance.

### **37. ESTIMATES OF QUANTITIES**

- A. Whenever estimated quantities of work to be done and materials to be furnished under this Contract are shown in any of Construction Documents, they are given for use in comparing bids and right is especially reserved to increase or diminish them as they may be deemed reasonably necessary or desirable by Department to complete the Work included in this Contract, and cost for such increase or diminution shall be adjusted in manner provided for in General Conditions of Contract Article 18 entitled "Changes in the Work".

### **38. LANDS AND RIGHTS-OF-WAY**

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

### **39. GENERAL GUARANTEE**

- A. Neither final certificate of payment nor any provision in Construction Documents nor partial or entire occupancy of premises by County shall constitute acceptance of work not done in accordance with Construction Documents or relieve Contractor of liability in respect to any expressed warranties or responsibility for faulty materials or workmanship.
  - 1. In no event shall making of any payment required by Contract constitute or be construed as waiver by County of any breach of covenants of Contract or waiver of any default of Contractor and making of any such payment by County while any such default or breach shall exist shall in no way impair or prejudice right of County with respect to recovery of damages or other remedy as result of such breach or default.
- B. Contractor shall remedy and make good all defective workmanship and materials and pay for any damage to other work resulting there from, which appear within period of one (1) year from date of substantial completion, providing such defects are not clearly due to abuse or misuse by County. Department will give notice of observed defects with reasonable promptness.
- C. Guarantee on work executed after certified date of substantial completion will begin on date when such work is inspected and approved by Architect / Engineer and Public Works Project Engineer.
- D. Where guarantees or warranties are required in sections of Specifications for periods in excess of one (1) year, such longer terms shall apply; however, Contractor's Performance and Payment Bonds shall not apply to any guarantee or warranty period in excess of one (1) year.

#### **40. CONFLICTING CONDITIONS**

- A. Any provision in any of Construction Documents which may be in conflict or inconsistent with any Articles in these General Conditions of Contract or Supplementary Conditions shall be void to extent of such conflict or inconsistency.
- B. In case of ambiguity or conflict between Drawings and Specifications, Specifications shall govern.
- C. Printed dimensions shall be followed in preference to measurements by scale. Large-scale drawings take precedence over small-scale drawings. Dimensions on Drawings and details are subject to field measurements of adjacent work.

#### **41. NOTICE AND SERVICE THEREOF**

- A. Any notice to Contractor from Department relative to any part of this Contract shall be in writing and considered delivered and service thereof completed, when said notice is posted, by certified or registered mail, to Contractor at Contractor's last given address, or delivered in person to said Contractor, or Contractor's authorized representative on the Work.

#### **42. PROTECTION OF LIVES AND HEALTH**

- A. In order to protect lives and health of Contractor's employees under Contract, Contractor shall comply with all pertinent provisions of Wisconsin Administrative Code, Rules of Department of Commerce, relating to Safety and Health.
- B. Contractor alone shall be responsible for safety, efficiency and adequacy of Contractor's tools, equipment and methods, and for any damage that may result from their failure or their improper construction, maintenance or operation.



#### **43. AFFIRMATIVE ACTION PROVISION AND MINORITY / WOMEN / DISADVANTAGED BUSINESS ENTERPRISES**

##### **A. Affirmative Action Provisions.**

1. During term of their Contract, Contractor agrees not to discriminate on basis of race, religion, color, sex, handicap, age, sexual preference, marital status, physical appearance, or national origin against any person, whether recipient of services (actual or potential), employee, or applicant for employment. Such equal opportunity shall include but not be limited to following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, rates of pay, and any other form of compensation or level of service(s). Contractor agrees to post in conspicuous places, these affirmative action standards so as to be visible to all employees, service recipients and applicants for this paragraph. Listing of prohibited bases for discrimination shall not be construed to amend in any fashion state or federal law setting forth additional bases and exceptions shall be permitted only to extent allowable in state or federal law.
2. Contractor is subject to this Article only if Contractor has ten (10) or more employees and receives \$10,000.00 or more in annual aggregate contracts with County. Contractor shall file and Affirmative Action Plan with Dane County Contract Compliance Officer in accord with Chapter 19 of Dane County Code of Ordinances. Such plan must be filed within fifteen (15) days of effective date of this Contract and failure to do so by said date shall constitute ground for immediate termination of Contract by County. Contractor shall also, during term of this Contract, provide copies of all announcements of employment opportunities to County's Contract Compliance Office, and shall report annually number of persons, by race, sex and handicap status, who apply for employment and, similarly classified, number hired and number rejected.
3. Contact Dane County Contract Compliance Officer at Dane County Contract Compliance Office, 210 Martin Luther King, Jr. Blvd., Room 421, Madison, WI 53703, 608/266-4114.
4. In all solicitations for employment placed on Contractor's behalf during term of this Contract, Contractor shall include statement to effect Contractor is "Equal Opportunity Employer". Contractor agrees to furnish all information and reports required by County's Contract Compliance Officer as same relate to affirmative action and nondiscrimination, which may include any books, records, or accounts deemed appropriate to determine compliance with Chapter 19, Dane County Code of Ordinances, and provision of this Contract.

##### **B. Minority / Women / Disadvantaged / Emerging Small Business Enterprises.**

1. Chapter 19.508 of Dane County Code of Ordinances is official policy of Dane County regarding utilization of, to fullest extent of, Minority Business Enterprises (MBEs), Women Business Enterprises (WBEs) Disadvantage Business Enterprises (DBEs) and Emerging Small Business Enterprises (ESBEs).
2. Contractor may utilize MBEs / WBEs / DBEs / ESBEs as subcontractors or suppliers. List of subcontractors will be required of low bidder as stated in this Contract. List shall indicate which are MBEs / WBEs / DBEs / ESBEs and percentage of subcontract awarded, shown as percentage of total dollar amount of bid.

#### **44. COMPLIANCE WITH FAIR LABOR STANDARDS**

- ##### **A.**
- During term of this Contract, Contractor shall report to County Contract Compliance Officer, within ten (10) days, any allegations to, or findings by National Labor Relations Board (NLRB) or Wisconsin Employment Relations Commission (WERC) that Contractor has violated statute or regulation regarding labor standards or relations. If investigation by Contract Compliance Officer results in final determination that matter adversely affects

Contractor's responsibilities under this Contract, and which recommends termination, suspension or cancellation of this Contract, County may take such action.

- B. Contractor may appeal any adverse finding by Contract Compliance Officer as set forth in Dane County Ordinance 25.015(11)(c) through (e).
- C. Contractor shall post this statement in prominent place visible to employees: "As condition of receiving and maintaining contract with Dane County, this employer shall comply with federal, state and all other applicable laws prohibiting retaliation or union organizing."

#### **45. DOMESTIC PARTNERSHIP BENEFITS**

- A. Contractor agrees to provide same economic benefits to all of its employees with domestic partners as it does to employees with spouses, or cash equivalent if such benefit cannot reasonably be provided. Contractor agrees to make available for County inspection Contractor's payroll records relating to employees providing services on or under this Contract or subcontract. If any payroll records of Contractor contain any false, misleading or fraudulent information, or if Contractor fails to comply with provisions of Chapter 25.016, Dane County Ordinances, contract compliance officer may withhold payments on Contract; terminate, cancel or suspend Contract in whole or in part; or, after due process hearing, deny Contractor right to participate in bidding on future County contracts for period of one year after first violation is found and for period of three years after second or subsequent violation is found.

#### **46. USE AND OCCUPANCY PRIOR TO ACCEPTANCE**

- A. Contractor agrees to use and occupancy of portion or unit of the Work before formal acceptance by Department, provided Department:
  - 1. Secures written consent of Contractor; except when in opinion of Public Works Project Engineer, Contractor is chargeable with unwarranted delay in final cleanup of punch list items or other Contract requirements.
  - 2. Secures endorsement from insurance carrier and consent of Surety permitting occupancy of building or use of the Work during remaining period of construction, or, secures consent of Surety.
  - 3. Assumes all costs and maintenance of heat, electricity and water.
  - 4. Accepts all work completed within that portion or unit of the Work to be occupied, at time of occupancy.

#### **47. MINIMUM WAGES**

- A. Contractor shall post, at appropriate conspicuous point on site of project, schedule showing all determined minimum wage rates for various classes of laborers and mechanics to be engaged in the Work under this Contract and all deductions, if any, required by law to be made from unpaid wages actually earned by laborers and mechanics so engaged.
- B. Supplementary Conditions section in Construction Documents lists wage determinations required by State Law.
- C. If, after award of Contract, it becomes necessary to employ any person in trade or occupation not classified in wage determinations, such person shall be paid at not less than such rate as shall be determined by Wisconsin Department of Workforce Development. Such approved minimum rate shall be retroactive to time of initial employment of such person in such trade

or occupation. Contractor shall notify Department of Contractor's intention to employ persons in trades or occupations not so classified in sufficient time for Department to obtain approved rates for such trades or occupations.

- D. Specified wage rates are minimum rates only, and Department will not consider any claims for additional compensation made by Contractor because of payment by Contractor of any wage rate in excess of applicable rate contained in this Contract. Contractor shall adjust any disputes in regard to payment of wages in excess of those specified in this Contract.
- E. Submit required affidavit(s) to Department of Public Works, Highway & Transportation, as requested and with final application for payment for work under said contract. Affidavit(s) shall clearly indicate name, trade or occupation, and paid wages of every laborer, workman or mechanic employed by Contractor and all subcontractors during billing period including accurate record of number of hours worked by each employee and actual wages paid as stipulated in Wisconsin Statute 66.0903. If Wisconsin Prevailing Wage Rate Determination is required for this Work, use "Prime Contractor Affidavit of Compliance With Prevailing Wage Rate Determination" and "Agent or Subcontractor Affidavit of Compliance With Prevailing Wage Rate Determination" (if applicable). If Wisconsin Prevailing Wage Rate Determination is not required for this Work, use "Dane County, Wisconsin Contractor Wage Affidavit". Forms of such affidavits are included in Supplementary Conditions.

#### **48. CLAIMS**

- A. No claim may be made until Department's Associate Public Works Director has reviewed Architect / Engineer's decision as provided for in Article 35 of General Conditions of Contract. If any claim remains unresolved after such review by Department's Associate Public Works Director, claim may be filed under Wisconsin Statute 893.80. Work shall progress during period of any dispute or claim. Unless specifically agreed between parties, venue will be in Dane County, Wisconsin.

#### **49. ANTITRUST AGREEMENT**

- A. Contractor and County recognize that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by County. Therefore, Contractor hereby assigns to County 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 price is established under this Contract and any change order thereto.

#### **50. INSURANCE**

- A. Contractor Carried Insurance:
  - 1. Contractor shall not commence work under this Contract until Contractor has obtained all insurance required under this Article and has provided evidence of such insurance to Risk Manager, 425 City-County Building, 210 Martin Luther King Jr. Blvd., Madison, WI 53703. Contractor shall not allow any subcontractor to commence work until insurance required of subcontractor has been so obtained and approved. Company providing insurance must be licensed to do business in Wisconsin.

2. Worker's Compensation Insurance:
  - a) Contractor shall procure and shall maintain during life of this Contract, Worker's Compensation Insurance as required by statute for all of Contractor's employees engaged in work at site of project under this Contract and, in case of any such work sublet, Contractor shall require subcontractor similarly to provide Worker's Compensation Insurance for all of latter's employees to be engaged in such work unless such employees are covered by protection afforded by Contractor's Worker's Compensation Insurance.
  - b) If any claim of employees engaged in hazardous work on project under this Contract is not protected under Worker's Compensation Statute, Contractor shall provide and shall cause each subcontractor to provide adequate Employer's Liability Insurance for protection of such of Contractor's employees as are not otherwise protected.
3. Contractor's Public Liability and Property Damage Insurance:
  - a) Contractor shall procure and maintain during life of this Contract, Contractor's Public Liability Insurance and Contractor's Property Damage Insurance in amount not less than \$1,000,000 bodily injury, including accidental death, to any one person, and subject to same limit for each person, in amount not less than \$1,000,000 on account of one accident, and Contractor's Property Damage Insurance in amount not less than \$1,000,000 or combined single limit of at least \$1,000,000 with excess coverage over and above general liability in amount not less than \$5,000,000. Contractor shall add "Dane County" as additional insured for each project.
  - b) Contractor's Public Liability and Property Damage Insurance shall include Products, Completed Operation, and Contractual Liability under Insurance Contract. "Contractor shall in all instances save, defend, indemnify and hold harmless County and Architect / Engineer against all claims, demands, liabilities, damages or any other costs which may accrue in prosecution of the Work and that Contractor will save, defend, indemnify and hold harmless County and Architect / Engineer from all damages caused by or as result of Contractor's operations" and each shall be listed as additional insured on Contractor's and sub-contractors' insurance policies.
  - c) Obligations of Contractor under Article 48.A.2)b) shall not extend to liability of Architect / Engineer, agents or employees thereof, arising out of:
    - 1) Preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications; or
    - 2) giving of or failure to give directions or instructions by Architect / Engineer, agents or employees thereof provided such giving or failure to give is primary cause of injury or damage.
  - d) Contractor shall procure and shall maintain during life of this Contract, Comprehensive Automobile Liability Insurance covering owned, non-owned and hired automobiles for limits of not less than \$1,000,000 each accident single limit, bodily injury and property damage combined with excess coverage over and above general liability in amount not less than \$5,000,000.
  - e) Contractor shall either:
    - 1) Require each subcontractor to procure and to maintain during life of subcontract, subcontractor's Public Liability Property Damage Insurance, and Comprehensive Automobile Liability Insurance of type and in same amount specified in preceding paragraphs; or
    - 2) Insure activities of subcontractors in Contractor's own policy.
4. Scope of Insurance and Special Hazards: Insurance required under Article 48.A.2 hereof shall provide adequate protection for Contractor and subcontractors, respectively, against damage claims which may arise from operations under this Contract, whether such operation be by insured or by anyone directly or indirectly employed by insured and also against any of special hazards which may be encountered in performance of this Contract as enumerated in Supplementary Conditions.

5. Proof of Carriage of Insurance: Contractor shall furnish Risk Manager with certificates showing type, amount, class of operations covered, effective dates, dates of expiration of policies and "Dane County" listed as additional insured. Such certificates shall also contain (substantially) following statement: "Insurance covered by this certificate will not be canceled or materially altered, except after ten (10) days written notice has been received by Risk Manager."

B. Builder's Risk:

1. County shall provide Builder's Risk policy. Terms of this policy will be made available by County's Risk Manager, upon Contractor's request. By executing this Contract, Contractor warrants it is familiar with terms of said policy.

C. Indemnification / Hold Harmless:

1. Contractor shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives from and against all claims, damages, losses and expenses including attorneys' fees arising out of or resulting from performance of the Work, provided that any such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting therefrom, and is caused in whole or in part by any act or omission of Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by part indemnified hereunder.
2. In any and all claims against Dane County, its boards, commissions, agencies, officers, employees and representatives or by any employee of Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, indemnification obligation under this Contract shall not be limited in any way by any limitation on amount or type of damages, compensation or benefits payable by or for Contractor or any subcontractor under worker's compensation acts, disability benefits or other employee benefit acts.
3. Obligations of Contractor under this Contract shall not extend to liability of Architect / Engineer, its agents or employees arising out of:
  - a) Preparation or approval of maps, drawings, opinion, reports, surveys, change orders, designs or specifications; or
  - b) Giving of or failure to give directions or instruction by Architect / Engineer, its agents or employees provided such giving or failure to give is primary cause of injury or damage.
4. Dane County shall not be liable to Contractor for damages or delays resulting from work by third parties or by injunctions or other restraining orders obtained by third parties.

## 51. WISCONSIN LAW CONTROLLING

- A. It is expressly understood and agreed to by parties hereto that in event of any disagreement or controversy between parties, Wisconsin law shall be controlling.

## SUPPLEMENTARY CONDITIONS

### 1. APPLICATION & CERTIFICATE FOR PAYMENT

- A. Every contractor engaged in performance of any contract for Department of Public Works, Highway & Transportation shall submit partial and final Application & Certificate for Payment for work under said contract. Form shall provide similar information as shown on AIA G702™ and G703™ forms (samples shown below). Forms shall be submitted to project Architect / Engineer for approval.

**AIA Document G702™ – 1992**

**Application and Certificate for Payment**

<b>TO OWNER:</b>	<b>PROJECT:</b>	<b>APPLICATION NO:</b>	<b>Distribution to:</b>
		<b>PERIOD TO:</b>	OWNER <input type="checkbox"/>
<b>FROM CONTRACTOR:</b>	<b>VIA ARCHITECT:</b>	<b>CONTRACT FOR:</b>	ARCHITECT <input type="checkbox"/>
		<b>CONTRACT DATE:</b>	CONTRACTOR <input type="checkbox"/>
		<b>PROJECT NOS:</b>	FIELD <input type="checkbox"/>
			OTHER <input type="checkbox"/>

**CONTRACTOR'S APPLICATION FOR PAYMENT**  
Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM \$ \_\_\_\_\_

2. Net change by Change Orders \$ \_\_\_\_\_

3. CONTRACT SUM TO DATE (Line 1 + 2) \$ \_\_\_\_\_

4. TOTAL COMPLETED & STORED TO DATE (Column G on G703) \$ \_\_\_\_\_

5. RETAINAGE:

a. % of Completed Work (Column D + E on G703) \$ \_\_\_\_\_

b. % of Stored Material (Column F on G703) \$ \_\_\_\_\_

Total Retainage (Lines 5a + 5b or Total in Column I of G703) \$ \_\_\_\_\_

6. TOTAL EARNED LESS RETAINAGE \$ \_\_\_\_\_

7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificates) \$ \_\_\_\_\_

8. CURRENT PAYMENT DUE \$ \_\_\_\_\_

9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 7 into Line 8) \$ \_\_\_\_\_

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:  
 By: \_\_\_\_\_ Date: \_\_\_\_\_  
 State of \_\_\_\_\_  
 County of \_\_\_\_\_  
 Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_  
 Notary Public:  
 My Commission expires: \_\_\_\_\_

**ARCHITECT'S CERTIFICATE FOR PAYMENT**  
In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED \$ \_\_\_\_\_  
(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT:  
 By: \_\_\_\_\_ Date: \_\_\_\_\_

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	\$	\$
Total approved this Month	\$	\$
<b>TOTALS</b>	\$	\$
<b>NET CHANGES by Change Order</b>	\$	\$

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**AIA** Document G703™ – 1992

**Continuation Sheet**

AIA Document G703, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.  
 In tabulations below, amounts are stated in the nearest dollar.  
 Use Column E on Contracts where variable retentions for line items may apply.

APPLICATION NO:  
 APPLICATION DATE:  
 PERIOD TO:  
 ARCHITECT'S PROJECT NO:

A LINE NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D WORK COMPLETED		F MATERIALS PRESENTLY STORED (DOLLARS)	G TOTAL COMPLETED TO DATE (DOLLARS)	H % (G ÷ C)	I BALANCE TO FINISH (\$ -)	J RETENTION (% VARIABLE RATE)
			E FROM PREVIOUS APPLICATION (DOLLARS)	E THIS PERIOD					

**CAUTION:** You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.  
 AIA Document G703™ – 1992 Copyright © 1993, 1995, 1997, 1970, 1978, 1982 and 1992 by The American Institute of Architects. All rights reserved. (AIA/INHO) This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. Purchasers are permitted to reproduce ten (10) copies of this document when completed. To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects legal counsel, copyright@aia.org.

**2. PREVAILING WAGE RATE DETERMINATION**

- A. These supplements shall modify, delete, and / or add to General Conditions of Contract. Where any article, paragraph, or subparagraph in General Conditions of Contract is supplemented by one of these paragraphs, provisions of such article, paragraph, or subparagraph shall remain in effect and supplementary provisions shall be considered as added thereto. Where any article, paragraph, or subparagraph in General Conditions of Contract is amended, voided, or superseded by any of these paragraphs, provisions of such article, paragraph, or subparagraph not so amended, voided, or superseded shall remain in effect.
  - 1. General Conditions of Contract Article 45, “Minimum Wages”, paragraph B. Following Prevailing Wage Rate Determination No. 201200152 is added to General Conditions of Contract.
- B. These State of Wisconsin forms, hereinafter set forth in this section, shall be filled out and submitted to Department of Public Works, Highway & Transportation:
  - 1. Disclosure of Ownership (ERD-7777)
  - 2. Prime Contractor Affidavit of Compliance With Prevailing Wage Rate Determination (ERD-5724)
  - 3. List of Agents and Subcontractors (Page 2 - ERD-5724)
  - 4. Agent or Subcontractor Affidavit of Compliance With Prevailing Wage Rate Determination (ERD-10584)
  - 5. List of Agents and Subcontractors (Page 2 - ERD-10584)
  - 6. Request To Employ Subjourneyperson (ERD-10880)

**ISSUE DATE:** 1/18/2012

**PROJECT:**

PHASE 2 BABCOCK & LAFOLLETTE PARK LOCKS & DAMS RENOVATION  
MC FARLAND VILLAGE, DANE COUNTY, WI  
Determination No. 201200152 [Owner Project No. 312001]

**PROJECT OWNER:**

SCOTT CARLSON, PROJECT MANAGER  
DANE COUNTY  
1919 ALLIANT ENERGY WAY  
MADISON, WI 53713

**REQUESTER:**

SCOTT CARLSON, PROJECT MANAGER  
DANE COUNTY  
1919 ALLIANT ENERGY WAY  
MADISON, WI 53713

**ADDITIONAL CONTACT:**

**NOTE:** The Requester must provide a copy of this Project Determination and enclosures to the Project Owner and Additional Contact.

The department received an application for prevailing wage rate determination for the above-captioned project. The department conducted a survey to determine the prevailing wage rate for the trade(s) or occupation(s) needed to complete the project. The survey's findings appear in the attached project determination.

If you believe that the wage rate for any trade or occupation does not accurately reflect the prevailing wage rate in the city, village or town where the project is located, you may ask the department to conduct an administrative review of such wage rate. You must submit this request in writing within 30 days from the date indicated above. Additionally, your request must include wage rate information from at least three similar projects in the city, village or town where the proposed project is located and on which some work has been performed by the contested trade(s) during the current survey period and was previously considered by the department in issuing the attached determination. See DWD 290.10 of the Wisconsin Administrative Code and either s. 66.0903(3)(br), s. 66.0904(4)(e), or s. 103.49(3)(c), Stats., for a complete explanation of the administrative review process.

Enclosures

It is hereby ordered that the prevailing wage rates set forth in the attached project determination shall only be applicable to the above referenced project. This order is a **FINAL ORDER** of the department unless a timely request for an administrative review is filed with the department.

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QJÙWÒÖÁÖYKÁ  
Equal Rights Division  
Labor Standards Bureau  
Construction Wage Standards Section  
PO Box 8928 Madison, WI 53708-8928  
(608)266-6861

Web Site: <http://dwd.wisconsin.gov/er/>

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**PREVAILING WAGE RATE DETERMINATION**

Issued by the State of Wisconsin  
Department of Workforce Development  
Pursuant to s. 66.0903, Wis. Stats.  
Issued On: 1/18/2012

**DETERMINATION NUMBER:** 201200152

**EXPIRATION DATE:** Prime Contracts MUST Be Awarded or Negotiated On Or Before 12/31/2012. If NOT, You MUST Reapply.

**PROJECT NAME:** PHASE 2 BABCOCK & LAFOLLETTE PARK LOCKS & DAMS RENOVATION  
PROJECT NO: 312001

**PROJECT LOCATION:** MC FARLAND VILLAGE, DANE COUNTY, WI

**CONTRACTING AGENCY:** DANE COUNTY

<b>CLASSIFICATION:</b>	Contractors are responsible for correctly classifying their workers. Either call the Department of Workforce Development (DWD) with trade or classification questions or consult DWD's Dictionary of Occupational Classifications & Work Descriptions on the DWD website at: <a href="http://dwd.wisconsin.gov/er/prevailing_wage_rate/Dictionary/dictionary_main.htm">dwd.wisconsin.gov/er/prevailing_wage_rate/Dictionary/dictionary_main.htm</a> .
<b>OVERTIME:</b>	<p>Time and one-half must be paid for all hours worked:</p> <ul style="list-style-type: none"><li>- over 10 hours per day on prevailing wage projects</li><li>- over 40 hours per calendar week</li><li>- Saturday and Sunday</li><li>- on all of the following holidays: January 1; the last Monday in May; July 4; the 1st Monday in September; the 4th Thursday in November; December 25;</li><li>- The day before if January 1, July 4 or December 25 falls on a Saturday;</li><li>- The day following if January 1, July 4 or December 25 falls on a Sunday.</li></ul> <p>Apply the time and one-half overtime calculation to whichever is higher between the Hourly Basic Rate listed on this project determination or the employee's regular hourly rate of pay. Add any applicable Premium or DOT Premium to the Hourly Basic Rate before calculating overtime.</p> <p>A DOT Premium (discussed below) may supersede this time and one-half requirement.</p>
<b>FUTURE INCREASE:</b>	When a specific trade or occupation requires a future increase, you MUST add the full hourly increase to the "TOTAL" on the effective date(s) indicated for the specific trade or occupation.
<b>PREMIUM PAY:</b>	If indicated for a specific trade or occupation, the full amount of such pay MUST be added to the "HOURLY BASIC RATE OF PAY" indicated for such trade or occupation, whenever such pay is applicable.
<b>DOT PREMIUM:</b>	This premium only applies to highway and bridge projects owned by the Wisconsin Department of Transportation and to the project type heading "Airport Pavement or State Highway Construction." DO NOT apply the premium calculation under any other project type on this determination.
<b>APPRENTICES:</b>	Pay apprentices a percentage of the applicable journey person's hourly basic rate of pay and hourly fringe benefit contributions specified in this determination. Obtain the appropriate percentage from each apprentice's contract or indenture.
<b>SUBJOURNEY:</b>	Subjourney wage rates may be available for some of the trades or occupations indicated below with the exception of laborers, truck drivers and heavy equipment operators. Any employer interested in using a subjourney classification on this project MUST complete Form ERD-10880 and request the applicable wage rate from the Department of Workforce Development PRIOR to using the subjourney worker on this project.

This document **MUST BE POSTED** by the **CONTRACTING AGENCY** in at least one conspicuous and easily accessible place **on the site of the project**. A local governmental unit may post this document at the place normally used to post public notices if there is no common site on the project. This document **MUST** remain posted during the entire time any worker is employed on the project and **MUST** be physically incorporated into the specifications and all contracts and subcontracts. If you have any questions, please write to the Equal Rights Division, Labor Standards Bureau, P.O. Box 8928, Madison, Wisconsin 53708 or call (608) 266-6861.

**The following statutory provisions apply to local governmental unit projects of public works and are set forth below pursuant to the requirements of s. 66.0903(8), Stats.**

**s. 66.0903 (1) (f) & s. 103.49 (1) (c) "PREVAILING HOURS OF LABOR"** for any trade or occupation in any area means 10 hours per day and 40 hours per week and may not include any hours worked on a Saturday or Sunday or on any of the following holidays:

1. January 1.
2. The last Monday in May.
3. July 4.
4. The first Monday in September.
5. The 4th Thursday in November.
6. December 25.
7. The day before if January 1, July 4 or December 25 falls on a Saturday.
8. The day following if January 1, July 4 or December 25 falls on a Sunday.

**s. 66.0903 (10) RECORDS; INSPECTION; ENFORCEMENT.**

(a) Each contractor, subcontractor, or contractor's or subcontractor's agent performing work on a project of public works that is subject to this section shall keep full and accurate records clearly indicating the name and trade or occupation of every person performing the work described in sub. (4) and an accurate record of the number of hours worked by each of those persons and the actual wages paid for the hours worked.

**s. 66.0903 (11) LIABILITY AND PENALTIES.**

(a) 1. Any contractor, subcontractor, or contractor's or subcontractor's agent who fails to pay the prevailing wage rate determined by the department under sub. (3) or who pays less than 1.5 times the hourly basic rate of pay for all hours worked in excess of the prevailing hours of labor is liable to any affected employee in the amount of his or her unpaid wages or his or her unpaid overtime compensation and in an additional amount as liquidated damages as provided under subd. 2., 3., whichever is applicable.

2. If the department determines upon inspection under sub. (10) (b) or (c) that a contractor, subcontractor, or contractor's or subcontractor's agent has failed to pay the prevailing wage rate determined by the department under sub. (3) or has paid less than 1.5 times the hourly basic rate of pay for all hours worked in excess of the prevailing hours of labor, the department shall order the contractor to pay to any affected employee the amount of his or her unpaid wages or his or her unpaid overtime compensation and an additional amount equal to 100 percent of the amount of those unpaid wages or that unpaid overtime compensation as liquidated damages within a period specified by the department in the order.

3. In addition to or in lieu of recovering the liability specified in subd. 1. as provided in subd. 2., any employee for and in behalf of that employee and other employees similarly situated may commence an action to recover that liability in any court of competent jurisdiction. If the court finds that a contractor, subcontractor, or contractor's or subcontractor's agent has failed to pay the prevailing wage rate determined by the department under sub. (3) or has paid less than 1.5 times the hourly basic rate of pay for all hours worked in excess of the prevailing hours of labor, the court shall order the contractor, subcontractor, or agent to pay to any affected employee the amount of his or her unpaid wages or his or her unpaid overtime compensation and an additional amount equal to 100 percent of the amount of those unpaid wages or that unpaid overtime compensation as liquidated damages.

5. No employee may be a party plaintiff to an action under subd. 3. unless the employee consents in writing to become a party and the consent is filed in the court in which the action is brought. Notwithstanding s. 814.04 (1), the court shall, in addition to any judgment awarded to the plaintiff, allow reasonable attorney fees and costs to be paid by the defendant.

<b>BUILDING OR HEAVY CONSTRUCTION</b>
---------------------------------------

Includes sheltered enclosures with walk-in access for the purpose of housing persons, employees, machinery, equipment or supplies and non-sheltered work such as canals, dams, dikes, reservoirs, storage tanks, etc. A sheltered enclosure need not be "habitable" in order to be considered a building. The installation of machinery and/or equipment, both above and below grade level, does not change a project's character as a building. On-site grading, utility work and landscaping are included within this definition. Residential buildings of four (4) stories or less, agricultural buildings, parking lots and driveways are NOT included within this definition.

<b>SKILLED TRADES</b>
-----------------------

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
<u>CODE</u>	<u>TRADE OR OCCUPATION</u>	\$	\$	\$
101	Acoustic Ceiling Tile Installer	29.06	15.16	44.22
102	Boilermaker	31.09	23.75	54.84
103	Bricklayer, Blocklayer or Stonemason Future Increase(s): Add \$.50/hr on 6/1/2012; Add \$ .80 on 6/1/2013 Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	32.26	16.60	48.86
104	Cabinet Installer	29.06	15.16	44.22
105	Carpenter	29.06	15.16	44.22
106	Carpet Layer or Soft Floor Coverer	29.06	15.16	44.22
107	Cement Finisher	32.03	15.13	47.16
108	Drywall Taper or Finisher	26.10	13.65	39.75
109	Electrician Future Increase(s): Add \$.50/hr on 6/1/2012. Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	32.55	18.68	51.23
110	Elevator Constructor	43.79	25.48	69.27
111	Fence Erector	25.50	0.26	25.76
112	Fire Sprinkler Fitter	36.39	16.75	53.14
113	Glazier	36.23	11.22	47.45
114	Heat or Frost Insulator	33.28	22.51	55.79
115	Insulator (Batt or Blown)	23.62	11.55	35.17
116	Ironworker	30.90	19.11	50.01
117	Lather	29.06	15.16	44.22

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
118	Line Constructor (Electrical)	35.97	18.08	54.05
119	Marble Finisher	31.16	16.27	47.43
120	Marble Mason	32.66	16.20	48.86
121	Metal Building Erector	22.00	4.11	26.11
122	Millwright	30.66	15.21	45.87
123	Overhead Door Installer	18.00	4.86	22.86
124	Painter	25.65	14.11	39.76
125	Pavement Marking Operator	26.00	0.00	26.00
126	Piledriver	29.56	15.16	44.72
127	Pipeline Fuser or Welder (Gas or Utility)	29.54	18.84	48.38
129	Plasterer	29.03	15.16	44.19
130	Plumber	36.20	15.02	51.22
132	Refrigeration Mechanic Future Increase(s): Add \$.85/hr on 12/1/11; Add \$.90/hr on 6/1/12; Add \$.85/hr on 12/1/12.	40.35	16.21	56.56
133	Roofer or Waterproofer	28.06	0.00	28.06
134	Sheet Metal Worker	34.23	20.19	54.42
135	Steamfitter Future Increase(s): Add \$.85/hr on 12/1/11; Add \$.90/hr on 6/1/12; Add \$.85/hr on 12/1/12.	40.35	16.21	56.56
137	Teledata Technician or Installer	21.26	6.99	28.25
138	Temperature Control Installer	32.55	18.68	51.23
139	Terrazzo Finisher	18.00	5.35	23.35
140	Terrazzo Mechanic	31.16	16.27	47.43
141	Tile Finisher Future Increase(s): Add \$.50/hr on 6/1/2012; Add \$ .80/hr on 6/1/2013.	23.77	16.00	39.77
142	Tile Setter Future Increase(s): Add \$.50/hr on 6/1/2012; Add \$ .80/hr on 6/1/2013.	29.71	16.00	45.71
143	Tuckpointer, Caulker or Cleaner	22.00	9.75	31.75
144	Underwater Diver (Except on Great Lakes)	36.20	18.81	55.01
146	Well Driller or Pump Installer	25.32	15.30	40.62

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
147	Siding Installer	16.74	2.58	19.32
150	Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	32.37	16.48	48.85
151	Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY	28.78	15.16	43.94
152	Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	17.80	9.00	26.80
153	Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	23.38	12.48	35.86
154	Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	21.30	10.97	32.27

**TRUCK DRIVERS**

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
201	Single Axle or Two Axle	18.00	6.98	24.98
203	Three or More Axle Future Increase(s): Add \$1.57/hr on 6/1/2012.	18.00	13.83	31.83
204	Articulated, Euclid, Dumptor, Off Road Material Hauler Future Increase(s): Add \$1/hr on 6/3/2012; Add \$1/hr on 6/2/2013.	31.89	17.98	49.87
205	Pavement Marking Vehicle	19.25	10.84	30.09
207	Truck Mechanic	18.00	13.68	31.68

**LABORERS**

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
301	General Laborer Future Increase(s): Add \$.50/hr. on 06/04/2012; Add \$.75/hr. on 06/03/2013 Premium Increase(s): Add \$1.00/hr for certified welder; Add \$.25/hr for mason tender	24.14	13.45	37.59
302	Asbestos Abatement Worker	23.96	12.88	36.84
303	Landscaper	17.00	6.36	23.36
310	Gas or Utility Pipeline Laborer (Other Than Sewer and Water)	20.39	12.20	32.59
311	Fiber Optic Laborer (Outside, Other Than Concrete Encased)	16.51	0.00	16.51
314	Railroad Track Laborer	14.00	4.77	18.77

**HEAVY EQUIPMENT OPERATORS  
SITE PREPARATION, UTILITY OR LANDSCAPING WORK ONLY**

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
501	Air Track, Rotary or Percussion Drilling Machine &/or Hammers, Blaster; Asphalt Milling Machine; Boring Machine (Directional, Horizontal or Vertical); Backhoe (Track Type) Having a Mfgr's Rated Capacity of 130,000 Lbs. or Over; Backhoe (Track Type) Having a Mfgr's Rated Capacity of Under 130,000 Lbs., Backhoe (Mini, 15,000 Lbs. & Under); Bulldozer or Endloader (Over 40 hp); Compactor (Self-Propelled 85 Ft Total Drum Width & Over, or Tractor Mounted, Towed & Light Equipment); Concrete Batch Plant, Batch Hopper; Concrete Breaker (Large, Auto, Vibratory/Sonic, Manual or Remote); Crane, Shovel, Dragline, Clamshells; Forklift (Machinery Moving or Steel Erection, 25 Ft & Over); Gradall (Cruz-Aire Type); Grader or Motor Patrol; Master Mechanic; Mechanic or Welder; Robotic Tool Carrier (With or Without Attachments); Scraper (Self Propelled or Tractor Drawn) 5 cu yds or More Capacity; Tractor or Truck Mounted Hydraulic Backhoe; Tractor or Truck Mounted Hydraulic Crane (10 Tons or Under); Tractor (Scraper, Dozer, Pusher, Loader); Trencher (Wheel Type or Chain Type Having Over 8 Inch Bucket). Future Increase(s): Add \$1/hr on 6/3/2012; Add \$1/hr on 6/2/2013.	32.42	17.98	50.40
502	Backfiller; Broom or Sweeper; Bulldozer or Endloader (Under 40 hp); Environmental Burner; Forestry Equipment, Timbco, Tree Shear, Tub Grinder, Processor; Jeep Digger; Screed (Milling Machine); Skid Rig; Straddle Carrier or Travel Lift; Stump Chipper; Trencher (Wheel Type or Chain Type Having 8 Inch Bucket & Under).	31.89	14.44	46.33
503	Air Compressor (&/or 400 CFM or Over); Augers (Vertical & Horizontal); Compactor (Self-Propelled 84 Ft Total Drum Width & Under, or Tractor Mounted, Towed & Light Equipment); Crusher, Screening or Wash Plant; Farm or Industrial Type Tractor; Forklift; Generator (&/or 150 KW or Over); Greaser; High Pressure Utility Locating Machine (Daylighting Machine); Mulcher; Oiler; Post Hole Digger or Driver; Pump (3 Inch or Over) or Well Points; Refrigeration Plant or Freeze Machine; Rock, Stone Breaker; Skid Steer Loader (With or Without Attachments); Vibratory Hammer or Extractor, Power Pack. Future Increase(s): Add \$1/hr on 6/3/2012; Add \$1/hr on 6/2/2013.	31.89	17.98	49.87
504	Work Performed on the Great Lakes Including Diver; Wet Tender or Hydraulic Dredge Engineer.	36.20	18.81	55.01
505	Work Performed on the Great Lakes Including Crane or Backhoe Operator; Assistant Hydraulic Dredge Engineer; Hydraulic Dredge Leverman or Diver's Tender; Mechanic or Welder; 70 Ton & Over Tug Operator. Premium Increase(s): Add \$.50/hr for friction crane, lattice boom or crane certification (CCO).	37.45	19.45	56.90

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
506	Work Performed on the Great Lakes Including Deck Equipment Operator or Machineryman (Maintains Cranes Over 50 Tons or Backhoes 115,000 Lbs. or More); Tug, Launch or Loader, Dozer or Like Equipment When Operated on a Barge, Breakwater Wall, Slip, Dock or Scow, Deck Machinery.	26.80	18.52	45.32
507	Work Performed on the Great Lakes Including Deck Equipment Operator, Machineryman or Fireman (Operates 4 Units or More or Maintains Cranes 50 Tons or Under or Backhoes 115,000 Lbs. or Under); Deck Hand, Deck Engineer or Assistant Tug Operator; Off Road Trucks - Great Lakes ONLY.	27.75	19.15	46.90

**HEAVY EQUIPMENT OPERATORS  
EXCLUDING SITE PREPARATION, UTILITY, PAVING LANDSCAPING WORK**

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
508	Boring Machine (Directional); Crane, Tower Crane, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons, Self-Erecting Tower Crane With a Lifting Capacity of Over 4,000 Lbs., Crane With Boom Dollies; Crane, Tower Crane, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 176 Ft or Over; Master Mechanic. Future Increase(s): Add \$1/hr on 6/3/2012; Add \$1/hr on 6/2/2013. Premium Increase(s): Add \$.50/hr at 200 ton; Add \$1.00/hr. at 300 ton; Add \$1.50/hr at 400 ton; Add \$2.00/hr at 500 ton.	34.62	17.98	52.60
509	Backhoe (Track Type) Having a Mfgr's Rated Capacity of 130,000 Lbs. or Over; Boring Machine (Horizontal or Vertical); Caisson Rig; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under, Self-Erecting Tower Crane With A Lifting Capacity Of 4,000 Lbs. & Under; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 175 Ft or Under; Pile Driver; Versi Lifts, Tri-Lifts & Gantrys (20,000 Lbs. & Over). Future Increase(s): Add \$1/hr on 6/3/2012; Add \$1/hr on 6/2/2013. Premium Increase(s): Add \$.25/hr for cranes with lifting capacity of 45 ton or over.	33.62	17.98	51.60
510	Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of Under 130,000 Lbs., Backhoe (Mini, 15,000 Lbs. & Under); Concrete Bump Cutter, Grinder, Planing or Grooving Machine; Concrete Laser/Screed; Concrete Paver (Slipform); Concrete Pump (Over 46 Meter), Concrete Conveyor (Rotec or Bidwell Type); Concrete Slipform Placer Curb & Gutter Machine; Concrete Spreader & Distributor; Dredge (NOT Performing Work on the Great Lakes); Forklift (Machinery Moving or Steel Erection, 25 Ft & Over); Gradall (Cruz-Aire Type); Hydro-Blaster (10,000 PSI or Over); Milling Machine; Skid Rig; Traveling Crane (Bridge Type). Future Increase(s): Add \$1/hr on 6/3/2012; Add \$1/hr on 6/2/2013.	32.42	17.98	50.40

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
511	Air, Track, Rotary or Percussion Drilling Machine &/or Hammers, Blaster; Bulldozer or Endloader (Over 40 hp); Compactor (Self-Propelled 85 Ft Total Drum Width & Over, or Tractor Mounted, Towed & Light Equipment); Concrete Pump (46 Meter & Under), Concrete Conveyor (Rotec or Bidwell Type); Crane (Carry Deck, Mini) or Truck Mounted Hydraulic Crane (10 Tons or Under); Environmental Burner; Gantrys (Under 20,000 Lbs.); Grader or Motor Patrol; High Pressure Utility Locating Machine (Daylighting Machine); Manhoist; Material or Stack Hoist; Mechanic or Welder; Railroad Track Rail Leveling Machine, Tie Placer, Extractor, Tamper, Stone Leveler or Rehabilitation Equipment; Roller (Over 5 Ton); Scraper (Self Propelled or Tractor Drawn) 5 cu yd or More Capacity; Screed (Milling Machine); Sideboom; Straddle Carrier or Travel Lift; Tining or Curing Machine; Tractor (Scraper, Dozer, Pusher, Loader); Tractor or Truck Mounted Hydraulic Backhoe; Tractor or Truck Mounted Hydraulic Crane (10 Tons or Under); Trencher (Wheel Type or Chain Type Having Over 8-Inch Bucket). Future Increase(s): Add \$1/hr on 6/3/2012; Add \$1/hr on 6/2/2013.	31.89	17.98	49.87
512	Backfiller; Broom or Sweeper; Bulldozer or Endloader (Under 40 hp); Compactor (Self-Propelled 84 Ft Total Drum Width & Under, or Tractor Mounted, Towed & Light Equipment); Concrete Batch Plant, Batch Hopper; Concrete Breaker (Large, Auto, Vibratory/Sonic, Manual or Remote); Concrete Conveyor System; Concrete Finishing Machine (Road Type); Fireman (Pile Driver & Derrick NOT Performing Work on the Great Lakes); Grout Pump; Hoist (Tugger, Automatic); Industrial Locomotives; Jeep Digger; Lift Slab Machine; Mulcher; Robotic Tool Carrier (With or Without Attachments); Roller (Rubber Tire, 5 Ton or Under); Screw or Gypsum Pumps; Stabilizing or Concrete Mixer (Self-Propelled or 14S or Over); Stump Chipper; Trencher (Wheel Type or Chain Type Having 8-Inch Bucket & Under); Winches & A-Frames.	35.59	19.10	54.69
513	Air Compressor (&/or 400 CFM or Over); Air, Electric or Hydraulic Jacking System; Augers (Vertical & Horizontal); Boatmen (NOT Performing Work on the Great Lakes); Boiler (Temporary Heat); Crusher, Screening or Wash Plant; Elevator; Farm or Industrial Type Tractor; Fireman (Asphalt Plant NOT Performing Work on the Great Lakes); Forklift; Generator (&/or 150 KW or Over); Greaser; Heaters (Mechanical); Loading Machine (Conveyor); Oiler; Post Hole Digger or Driver; Prestress Machine; Pump (3 Inch or Over) or Well Points; Refrigeration Plant or Freeze Machine; Rock, Stone Breaker; Skid Steer Loader (With or Without Attachments); Vibratory Hammer or Extractor, Power Pack. Future Increase(s): Add \$1/hr on 6/3/2012; Add \$1/hr on 6/2/2013.	29.19	17.98	47.17
514	Gas or Utility Pipeline, Except Sewer & Water (Primary Equipment). Future Increase(s): Add \$2/hr. on 1/1/2013.	34.89	19.68	54.57
515	Gas or Utility Pipeline, Except Sewer & Water (Secondary Equipment).	30.32	17.40	47.72
516	Fiber Optic Cable Equipment	22.00	7.27	29.27



<b>SEWER, WATER OR TUNNEL CONSTRUCTION</b>
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Includes those projects that primarily involve public sewer or water distribution, transmission or collection systems and related tunnel work (excluding buildings).

<b>SKILLED TRADES</b>
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<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
		\$	\$	\$
103	Bricklayer, Blocklayer or Stonemason	32.66	16.20	48.86
105	Carpenter Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	33.43	19.31	52.74
107	Cement Finisher Future Increase(s): Add \$1.86 on 6/1/12; Add \$1.87 on 6/1/13; Add \$1.87 on 6/1/14; Add \$1.87 on 6/1/15; Add \$1.75 on 6/1/16. Premium Increase(s): DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add \$1.40/hr when the Wisconsin Department of Transportation or responsible governing agency requires that work be performed at night under artificial illumination with traffic control and the work is completed after sunset and before sunrise.	30.68	15.68	46.36
109	Electrician Future Increase(s): Add \$1.40/hr on 6/1/2012. Add \$1.60/hr on 6/1/2013. Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	31.54	20.95	52.49
111	Fence Erector	25.50	0.26	25.76
116	Ironworker Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	31.31	22.22	53.53
118	Line Constructor (Electrical)	35.97	18.08	54.05
125	Pavement Marking Operator	26.00	0.00	26.00
126	Piledriver	29.56	15.16	44.72
130	Plumber	36.20	15.02	51.22
135	Steamfitter	39.90	15.76	55.66
137	Teledata Technician or Installer	21.26	6.99	28.25

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
143	Tuckpointer, Caulker or Cleaner	22.00	9.75	31.75
144	Underwater Diver (Except on Great Lakes)	36.20	18.81	55.01
146	Well Driller or Pump Installer	24.22	14.80	39.02
150	Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	32.37	16.48	48.85
151	Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY	28.78	15.16	43.94
152	Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	17.80	9.00	26.80
153	Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	23.38	12.48	35.86
154	Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	21.30	10.97	32.27

**TRUCK DRIVERS**

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
201	Single Axle or Two Axle	23.00	8.64	31.64
203	Three or More Axle	21.17	9.51	30.68
204	Articulated, Euclid, Dumptor, Off Road Material Hauler Future Increase(s): Add \$1.75/hr on 6/1/2012; Add \$1.85/hr on 6/1/2013. Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	22.50	16.19	38.69
205	Pavement Marking Vehicle	19.25	10.84	30.09
207	Truck Mechanic	21.17	9.51	30.68

**LABORERS**

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
301	General Laborer Future Increase(s): Add \$.70/hr. on 06/04/2012; Add \$.80/hr. on 06/03/2013 Premium Increase(s): Add \$.20 for blaster, bracer, manhole builder, caulker, bottomman and power tool; Add \$.55 for pipelayer; Add \$1.00 for tunnel work 0-15 lbs. compressed air; Add \$2.00 for over 15-30 lbs. compressed air; Add \$3.00 for over 30 lbs. compressed air.	25.28	13.44	38.72

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
303	Landscaper	17.00	6.36	23.36
304	Flagperson or Traffic Control Person	12.00	17.89	29.89
311	Fiber Optic Laborer (Outside, Other Than Concrete Encased)	16.51	0.00	16.51
314	Railroad Track Laborer	14.00	4.77	18.77

**HEAVY EQUIPMENT OPERATORS  
SEWER, WATER OR TUNNEL WORK**

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
521	Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of 130,000 Lbs. or Over; Caisson Rig; Crane, Tower Crane, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 176 Ft or Over; Crane, Tower Crane, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons, Self-Erecting Tower Crane With a Lifting Capacity Of Over 4,000 Lbs., Crane With Boom Dollies; Master Mechanic; Pile Driver. Future Increase(s): Add \$1/hr on 6/3/2012; Add \$1/hr on 6/2/2013. Premium Increase(s): Add \$.25/hr for cranes with lifting capacity of 45 ton or over.	33.62	17.98	51.60
522	Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of Under 130,000 Lbs., Backhoe (Mini, 15,000 Lbs. & Under); Boring Machine (Directional); Concrete Bump Cutter, Grinder, Planing or Grooving Machine; Concrete Laser/Screed; Concrete Paver (Slipform); Concrete Pump (Over 46 Meter), Concrete Conveyor (Rotec or Bidwell Type); Concrete Spreader & Distributor; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 175 Ft or Under; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under, Self-Erecting Tower Crane With a Lifting Capacity of 4,000 Lbs. & Under; Dredge (NOT Performing Work on the Great Lakes); Milling Machine; Skid Rig; Telehandler; Traveling Crane (Bridge Type). Future Increase(s): Add \$1/hr on 6/3/2012; Add \$1/hr on 6/2/2013.	32.42	17.98	50.40

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
523	Air Track, Rotary or Percussion Drilling Machine &/or Hammers, Blaster; Boring Machine (Horizontal or Vertical); Bulldozer or Endloader (Over 40 hp); Crane (Carry Deck, Mini) or Truck Mounted Hydraulic Crane (10 Tons or Under); Concrete Pump (46 Meter & Under), Concrete Conveyor (Rotec or Bidwell Type); Concrete Slipform Placer Curb & Gutter Machine; Gradall (Cruz-Aire Type); Grader or Motor Patrol; Hydro-Blaster (10,000 PSI or Over); Manhoist; Material or Stack Hoist; Mechanic or Welder; Roller (Over 5 Ton); Scraper (Self Propelled or Tractor Drawn) 5 cu yd or More Capacity; Screed (Milling Machine); Sideboom; Straddle Carrier or Travel Lift; Tractor (Scraper, Dozer, Pusher, Loader); Tractor or Truck Mounted Hydraulic Backhoe; Tractor or Truck Mounted Hydraulic Crane (10 Tons or Under); Trencher (Wheel Type or Chain Type Having Over 8-Inch Bucket). Future Increase(s): Add \$1/hr on 6/3/2012; Add \$1/hr on 6/2/2013.	31.89	17.98	49.87
524	Backfiller; Broom or Sweeper; Bulldozer or Endloader (Under 40 hp); Compactor (Self-Propelled 85 Ft Total Drum Width & Over, or Tractor Mounted, Towed & Light Equipment); Concrete Batch Plant, Batch Hopper; Concrete Breaker (Large, Auto, Vibratory/Sonic, Manual or Remote); Concrete Conveyor System; Concrete Finishing Machine (Road Type); Environmental Burner; Fireman (Pile Driver & Derrick NOT Performing Work on the Great Lakes); Forestry Equipment, Timbco, Tree Shear, Tub Grinder, Processor; Hoist (Tugger, Automatic); Grout Pump; Jeep Digger; Lift Slab Machine; Mulcher; Power Subgrader; Pump (3 Inch or Over) or Well Points; Robotic Tool Carrier (With or Without Attachments); Roller (Rubber Tire, 5 Ton or Under); Screw or Gypsum Pumps; Stabilizing or Concrete Mixer (Self-Propelled or 14S or Over); Stump Chipper; Tining or Curing Machine; Trencher (Wheel Type or Chain Type Having 8-Inch Bucket & Under); Winches & A-Frames.	30.89	17.16	48.05
525	Air Compressor (&/or 400 CFM or Over); Air, Electric or Hydraulic Jacking System; Augers (Vertical & Horizontal); Compactor (Self-Propelled 84 Ft Total Drum Width & Under, or Tractor Mounted, Towed & Light Equipment); Crusher, Screening or Wash Plant; Farm or Industrial Type Tractor; Fireman (Asphalt Plant NOT Performing Work on the Great Lakes); Generator (&/or 150 KW or Over); Heaters (Mechanical); High Pressure Utility Locating Machine (Daylighting Machine); Loading Machine (Conveyor); Post Hole Digger or Driver; Refrigeration Plant or Freeze Machine; Rock, Stone Breaker; Skid Steer Loader (With or Without Attachments); Vibratory Hammer or Extractor, Power Pack. Future Increase(s): Add \$1/hr on 6/3/2012; Add \$1/hr on 6/2/2013.	29.19	17.98	47.17
526	Boiler (Temporary Heat); Forklift; Greaser; Oiler.	29.19	17.96	47.15
527	Work Performed on the Great Lakes Including Diver; Wet Tender or Hydraulic Dredge Engineer.	36.20	18.81	55.01
528	Work Performed on the Great Lakes Including 70 Ton & Over Tug Operator; Assistant Hydraulic Dredge Engineer; Crane or Backhoe Operator; Hydraulic Dredge Leverman or Diver's Tender; Mechanic or Welder.	36.20	18.81	55.01

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>				
<b><u>CODE</u></b>	<b><u>TRADE OR OCCUPATION</u></b>	<b><u>HOURLY BASIC RATE OF PAY</u></b>	<b><u>HOURLY FRINGE BENEFITS</u></b>	<b><u>TOTAL</u></b>
		<b>\$</b>	<b>\$</b>	<b>\$</b>
529	Work Performed on the Great Lakes Including Deck Equipment Operator or Machineryman (Maintains Cranes Over 50 Tons or Backhoes 115,000 Lbs. or More); Tug, Launch or Loader, Dozer or Like Equipment When Operated on a Barge, Breakwater Wall, Slip, Dock or Scow, Deck Machinery.	26.80	18.52	45.32
530	Work Performed on the Great Lakes Including Deck Equipment Operator; Machineryman or Fireman (Operates 4 Units or More or Maintains Cranes 50 Tons or Under or Backhoes 115,000 Lbs. or Under), Deck Hand, Deck Engineer or Assistant Tug Operator; Off Road Trucks - Great Lakes ONLY.	26.80	18.52	45.32

<b>LOCAL STREET OR MISCELLANEOUS PAVING CONSTRUCTION</b>
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Includes roads, streets, alleys, trails, bridges, paths, racetracks, parking lots and driveways (except residential or agricultural), public sidewalks or other similar projects (excluding projects awarded by the Wisconsin Department of Transportation).

<b>SKILLED TRADES</b>
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<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
		\$	\$	\$
103	Bricklayer, Blocklayer or Stonemason	32.66	16.20	48.86
105	Carpenter	29.06	15.16	44.22
107	Cement Finisher Future Increase(s): Add \$1.86 on 6/1/12; Add \$1.87 on 6/1/13; Add \$1.87 on 6/1/14; Add \$1.87 on 6/1/15; Add \$1.75 on 6/1/16. Premium Increase(s): DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add \$1.40/hr when the Wisconsin Department of Transportation or responsible governing agency requires that work be performed at night under artificial illumination with traffic control and the work is completed after sunset and before sunrise.	30.68	15.68	46.36
109	Electrician Future Increase(s): Add \$.50/hr. effective 06/04/2012. Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	28.74	17.86	46.60
111	Fence Erector	25.50	0.26	25.76
116	Ironworker	30.90	19.11	50.01
118	Line Constructor (Electrical)	35.97	18.08	54.05
124	Painter	25.65	14.11	39.76
125	Pavement Marking Operator	26.00	0.00	26.00
126	Piledriver	29.56	15.16	44.72
133	Rofer or Waterproofer	28.06	0.00	28.06
137	Teledata Technician or Installer	21.26	6.99	28.25
143	Tuckpointer, Caulker or Cleaner	22.00	9.75	31.75
144	Underwater Diver (Except on Great Lakes)	36.20	18.81	55.01
150	Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	35.42	12.90	48.32

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
151	Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	29.64	14.64	44.28
152	Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	25.18	13.07	38.25
153	Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	23.38	12.48	35.86
154	Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	21.30	10.97	32.27

**TRUCK DRIVERS**

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
201	Single Axle or Two Axle	15.00	0.00	15.00
203	Three or More Axle	19.50	4.97	24.47
204	Articulated, Euclid, Dumptor, Off Road Material Hauler Future Increase(s): Add \$1/hr on 6/3/2012; Add \$1/hr on 6/2/2013.	31.89	17.98	49.87
205	Pavement Marking Vehicle	19.25	10.84	30.09
206	Shadow or Pilot Vehicle	15.00	0.00	15.00
207	Truck Mechanic	19.50	4.97	24.47

**LABORERS**

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
301	General Laborer	26.15	12.29	38.44
303	Landscaper	23.71	15.07	38.78
304	Flagperson or Traffic Control Person	12.00	17.89	29.89
311	Fiber Optic Laborer (Outside, Other Than Concrete Encased)	16.51	0.00	16.51
314	Railroad Track Laborer	14.00	4.77	18.77

**HEAVY EQUIPMENT OPERATORS  
CONCRETE PAVEMENT OR BRIDGE WORK**

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
541	<p>Crane, Tower Crane, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons, Self-Erecting Tower Crane With a Lifting Capacity Of Over 4,000 Lbs., Crane With Boom Dollies; Crane, Tower Crane, Pedestal Tower or Derrick, With Boom, Leads &amp;/or Jib Lengths Measuring 176 Ft or Over; Master Mechanic.</p> <p>Future Increase(s): Add \$2/hr on 6/1/12; Add \$2/hr on 6/1/13; Add \$1.75/hr on 6/1/14.</p> <p>Premium Increase(s): DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day &amp; Christmas Day. 2) Add \$1.25/hr for work on projects involving temporary traffic control setup, for lane and shoulder closures, when work under artificial illumination conditions is necessary as required by the project provisions (including prep time prior to and/or cleanup after such time period).</p>	34.22	18.90	53.12
542	<p>Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of 130,000 Lbs. or Over; Caisson Rig; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under, Self-Erecting Tower Crane With a Lifting Capacity of 4,000 Lbs. &amp; Under; Crane, Tower Crane Portable Tower, Pedestal Tower or Derrick, With Boom, Leads &amp;/or Jib Lengths Measuring 175 Ft or Under; Dredge (NOT Performing Work on the Great Lakes); Licensed Boat Pilot (NOT Performing Work on the Great Lakes); Pile Driver.</p> <p>Future Increase(s): Add \$2/hr on 6/1/12; Add \$2/hr on 6/1/13; Add \$1.75/hr on 6/1/14.</p> <p>Premium Increase(s): DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day &amp; Christmas Day. 2) Add \$1.25/hr for work on projects involving temporary traffic control setup, for lane and shoulder closures, when work under artificial illumination conditions is necessary as required by the project provisions (including prep time prior to and/or cleanup after such time period).</p>	33.72	18.90	52.62



**Fringe Benefits Must Be Paid On All Hours Worked**

<u>CODE</u>	<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u> \$	<u>HOURLY FRINGE BENEFITS</u> \$	<u>TOTAL</u> \$
543	<p>Air Track, Rotary or Percussion Drilling Machine &amp;/or Hammers, Blaster; Automatic Subgrader (Concrete); Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of Under 130,000 Lbs., Backhoe (Mini, 15,000 Lbs. &amp; Under); Boring Machine (Directional, Horizontal or Vertical); Bridge (Bidwell) Paver; Bulldozer or Endloader; Concrete Batch Plant, Batch Hopper; Concrete Breaker (Large, Auto, Vibratory/Sonic, Manual or Remote); Concrete Bump Cutter, Grinder, Planing or Grooving Machine; Concrete Conveyor System; Concrete Laser/Screed; Concrete Paver (Slipform); Concrete Pump, Concrete Conveyor (Rotec or Bidwell Type); Concrete Slipform Placer Curb &amp; Gutter Machine; Concrete Spreader &amp; Distributor; Crane (Carry Deck, Mini) or Truck Mounted Hydraulic Crane (10 Tons or Under); Crane With a Lifting Capacity of 25 Tons or Under; Forestry Equipment, Timbco, Tree Shear, Tub Grinder, Processor; Gradall (Cruz-Aire Type); Grader or Motor Patrol; Grout Pump; Hydro-Blaster (10,000 PSI or Over); Loading Machine (Conveyor); Manhoist; Material or Stack Hoist; Mechanic or Welder; Milling Machine; Post Hole Digger or Driver; Scraper (Self Propelled or Tractor Drawn) 5 cu yds or More Capacity; Shoulder Widener; Sideboom; Skid Rig; Stabilizing or Concrete Mixer (Self-Propelled or 14S or Over); Straddle Carrier or Travel Lift; Tractor (Scraper, Dozer, Pusher, Loader); Tractor or Truck Mounted Hydraulic Backhoe; Trencher (Wheel Type or Chain Type); Tube Finisher; Tugger (NOT Performing Work on the Great Lakes); Winches &amp; A-Frames.</p> <p>Future Increase(s): Add \$2/hr on 6/1/12; Add \$2/hr on 6/1/13; Add \$1.75/hr on 6/1/14.</p> <p>Premium Increase(s): DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day &amp; Christmas Day. 2) Add \$1.25/hr for work on projects involving temporary traffic control setup, for lane and shoulder closures, when work under artificial illumination conditions is necessary as required by the project provisions (including prep time prior to and/or cleanup after such time period).</p>	33.22	18.90	52.12

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
544	Backfiller; Belting, Burlap, Texturing Machine; Broom or Sweeper; Compactor (Self-Propelled or Tractor Mounted, Towed & Light Equipment); Concrete Finishing Machine (Road Type); Environmental Burner; Farm or Industrial Type Tractor; Fireman (Pile Driver & Derrick NOT Performing Work on the Great Lakes); Forklift; Greaser; Jeep Digger; Joint Sawyer (Multiple Blade); Launch (NOT Performing Work on the Great Lakes); Lift Slab Machine; Mechanical Float; Mulcher; Power Subgrader; Robotic Tool Carrier (With or Without Attachments); Self Propelled Chip Spreader; Shouldering Machine; Skid Steer Loader (With or Without Attachments); Telehandler; Tining or Curing Machine. Future Increase(s): Add \$2/hr on 6/1/12; Add \$2/hr on 6/1/13; Add \$1.75/hr on 6/1/14. Premium Increase(s): DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add \$1.25/hr for work on projects involving temporary traffic control setup, for lane and shoulder closures, when work under artificial illumination conditions is necessary as required by the project provisions (including prep time prior to and/or cleanup after such time period).	33.22	18.90	52.12
545	Air Compressor (&/or 400 CFM or Over); Air, Electric or Hydraulic Jacking System; Automatic Belt Conveyor & Surge Bin; Boiler (Temporary Heat); Concrete Proportioning Plant; Crusher, Screening or Wash Plant; Generator (&/or 150 KW or Over); Heaters (Mechanical); High Pressure Utility Locating Machine (Daylighting Machine); Mudjack; Oiler; Prestress Machine; Pug Mill; Pump (3 Inch or Over) or Well Points; Rock, Stone Breaker; Screed (Milling Machine); Stump Chipper; Tank Car Heaters; Vibratory Hammer or Extractor, Power Pack.	30.42	17.58	48.00
546	Fiber Optic Cable Equipment.	22.00	7.27	29.27
547	Work Performed on the Great Lakes Including Diver; Wet Tender or Hydraulic Dredge Engineer.	36.20	18.81	55.01
548	Work Performed on the Great Lakes Including 70 Ton & Over Tug Operator; Assistant Hydraulic Dredge Engineer; Crane or Backhoe Operator; Hydraulic Dredge Leverman or Diver's Tender; Mechanic or Welder.	36.20	18.81	55.01
549	Work Performed on the Great Lakes Including Deck Equipment Operator or Machineryman (Maintains Cranes Over 50 Tons or Backhoes 115,000 Lbs. or more); Tug, Launch or Loader, Dozer or Like Equipment When Operated on a Barge, Breakwater Wall, Slip, Dock or Scow, Deck Machinery.	26.80	18.52	45.32
550	Work Performed on the Great Lakes Including Deck Equipment Operator; Machineryman or Fireman (Operates 4 Units or More or Maintains Cranes 50 Tons or Under or Backhoes 115,000 Lbs. or Under); Deck Hand, Deck Engineer or Assistant Tug Operator; Off Road Trucks - Great Lakes ONLY.	26.80	18.52	45.32

**HEAVY EQUIPMENT OPERATORS  
ASPHALT PAVEMENT OR OTHER WORK**

<b>Fringe Benefits Must Be Paid On <u>All</u> Hours Worked</b>		<b>HOURLY BASIC RATE OF PAY</b>	<b>HOURLY FRINGE BENEFITS</b>	<b>TOTAL</b>
<b>CODE</b>	<b>TRADE OR OCCUPATION</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
551	Crane, Tower Crane, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons, Self Erecting Tower Crane With a Lifting Capacity of Over 4,000 Lbs., Crane With Boom Dollies; Crane, Tower Crane, Pedestal Tower or Derrick, With Boom, Leads and/or Jib Lengths Measuring 176 Ft or Over; Master Mechanic.	34.62	17.96	52.58
552	Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of 130,000 Lbs. or Over; Caisson Rig; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under, Self-Erecting Tower Crane With a Lifting Capacity Of 4,000 Lbs. & Under; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 175 Ft or Under; Dredge (NOT Performing Work on the Great Lakes); Licensed Boat Pilot (NOT Performing Work on the Great Lakes); Pile Driver. Future Increase(s): Add \$2/hr on 6/1/12; Add \$2/hr on 6/1/13; Add \$1.75/hr on 6/1/14. Premium Increase(s): DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add \$1.25/hr for work on projects involving temporary traffic control setup, for lane and shoulder closures, when work under artificial illumination conditions is necessary as required by the project provisions (including prep time prior to and/or cleanup after such time period).	33.72	18.90	52.62

**Fringe Benefits Must Be Paid On All Hours Worked**

<u>CODE</u>	<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u> \$	<u>HOURLY FRINGE BENEFITS</u> \$	<u>TOTAL</u> \$
553	Air, Track, Rotary or Percussion Drilling Machine &/or Hammers, Blaster; Asphalt Heater, Planer & Scarifier; Asphalt Milling Machine; Asphalt Screed; Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of Under 130,000 Lbs., Backhoe (Mini, 15,000 Lbs. & Under); Bituminous (Asphalt) Plant & Paver, Screed; Boring Machine (Directional, Horizontal or Vertical); Bulldozer or Endloader; Concrete Breaker (Large, Auto, Vibratory/Sonic, Manual or Remote); Concrete Conveyor System; Concrete Laser/Screed; Concrete Slipform Placer Curb & Gutter Machine; Crane (Carry Deck, Mini) or Truck Mounted Hydraulic Crane (10 Tons or Under); Crane With a Lifting Capacity of 25 Tons or Under; Forestry Equipment, Timbco, Tree Shear, Tub Grinder, Processor; Gradall (Cruz-Aire Type); Grader or Motor Patrol; Hydro-Blaster (10,000 PSI or Over); Loading Machine (Conveyor); Manhoist; Material or Stack Hoist; Mechanic or Welder; Milling Machine; Post Hole Digger or Driver; Railroad Track Rail Leveling Machine, Tie Placer, Extractor, Tamper, Stone Leveler or Rehabilitation Equipment; Roller (Over 5 Ton); Scraper (Self Propelled or Tractor Drawn) 5 cu yds or More Capacity; Shoulder Widener; Sideboom; Skid Rig; Stabilizing or Concrete Mixer (Self-Propelled or 14S or Over); Tractor (Scraper, Dozer, Pusher, Loader); Tractor or Truck Mounted Hydraulic Backhoe; Trencher (Wheel Type or Chain Type); Tube Finisher; Tugger (NOT Performing Work on the Great Lakes); Winches & A-Frames. Future Increase(s): Add \$2/hr on 6/1/12; Add \$2/hr on 6/1/13; Add \$1.75/hr on 6/1/14.	32.67	18.55	51.22
554	Backfiller; Broom or Sweeper; Compactor (Self-Propelled or Tractor Mounted, Towed & Light Equipment); Concrete Finishing Machine (Road Type); Environmental Burner; Farm or Industrial Type Tractor; Fireman (Asphalt Plant, Pile Driver & Derrick NOT Performing Work on the Great Lakes); Forklift; Greaser; Hoist (Tugger, Automatic); Jeep Digger; Joint Sawyer (Multiple Blade); Launch (NOT Performing Work on the Great Lakes); Lift Slab Machine; Mechanical Float; Mulcher; Power Subgrader; Robotic Tool Carrier (With or Without Attachments); Roller (Rubber Tire, 5 Ton or Under); Self-Propelled Chip Spreader; Shouldering Machine; Skid Steer Loader (With or Without Attachments); Telehandler.	31.52	17.89	49.41
555	Air Compressor (&/or 400 CFM or Over); Air, Electric or Hydraulic Jacking System; Augers (Vertical & Horizontal); Automatic Belt Conveyor & Surge Bin; Boiler (Temporary Heat); Crusher, Screening or Wash Plant; Generator (&/or 150 KW or Over); Heaters (Mechanical); High Pressure Utility Locating Machine (Daylighting Machine); Mudjack; Oiler; Prestress Machine; Pug Mill; Pump (3 Inch or Over) or Well Points; Rock, Stone Breaker; Screed (Milling Machine); Stump Chipper; Tank Car Heaters; Vibratory Hammer or Extractor, Power Pack. Future Increase(s): Add \$2/hr on 6/1/12; Add \$2/hr on 6/1/13; Add \$1.75/hr on 6/1/14.	32.67	18.55	51.22
556	Fiber Optic Cable Equipment.	22.00	7.27	29.27

\*\*\*\*\* END OF RATES \*\*\*\*\*

The documents following the Prevailing Wage Rate Determination consist of 18 pages of various forms/documents that will be used throughout the completion of the project. The chart below lists the form number, form/document name, the party who uses the document, and the document's number of pages. If you have any questions regarding these forms please call the Prevailing Wage Office at (608)266-6861.

ERD Form Number	Form Name	Party Who Uses the Form	Pages
16056	Post the White Sheet	Contracting agency	1
16770	Substance Abuse Prevention on Public Works and Publicly Funded Projects, §103.503, Wis. Stats.	All contractors working on public works and publicly funded private construction projects	1
10908	Consolidated List of Debarred Contractors	Any party contracting someone to complete work on a prevailing wage project	2
7777	Disclosure of Ownership	Contractors that meet the criteria set out in (3)(A)&(B) of the form	1
5724	Prime Contractor Affidavit of Compliance	Prime contractor files with contracting agency upon completion of the work before receiving final payment	2
10584	Agent or Subcontractor Affidavit of Compliance	Subcontractors file with their awarding contractor upon completion of their work on the project before receiving final payment	2
10880	Request to Employ Subjourneyperson	Contractors wishing to employ a subjourneyperson(s)	1
	Prevailing Wage - Public Entity Project Owners	Explanation of project owner responsibilities	2
	Prevailing Wage – Contractors	Explanation of contractor responsibilities	2
	Summary of Prevailing Wage Law Changes Effective July 1, 2011	Information for public entity or any other interested party	4

01/13/12

## **POST THE WHITE SHEET**

As the public entity receiving this prevailing wage rate determination, **YOU ARE REQUIRED** by law to post the prevailing wage rate determination (i.e., white sheet) in at least one conspicuous and easily accessible place on the project site that is available to all construction workers. The white sheet must remain posted from the onset of the project until all construction labor on the project has been completed.

[See, Wis. Admin. Code §DWD 290.12(1)]

Posting the white sheet inside the general contractor's trailer does not meet this requirement. That placement is not available/accessible to all workers and is not a location over which you have control.

If you have questions about posting, please call (608)266-6861 and ask for prevailing wage intake.

## **Disclaimer**

**Employers performing work on public works and publicly funded private construction projects in Wisconsin are required to have a written substance abuse testing program in place. The provisions of this requirement are contained in Sec. 103.503, Wis. Stats. The Department of Workforce Development is neither responsible for enforcement of this law nor authorized to answer questions concerning its provisions. For legal advice on complying with Sec. 103.503, Wis. Stats., you may wish to consult with a private attorney.**

### **103.503 Substance abuse prevention on public works and publicly funded projects. (1) DEFINITIONS.** In this section:

(a) "Accident" means an incident caused, contributed to, or otherwise involving an employee that resulted or could have resulted in death, personal injury, or property damage and that occurred while the employee was performing the work described in s. 66.0903 (4), 66.0904 (3), or 103.49 (2m) on a project.

(b) "Alcohol" has the meaning given in s. 340.01 (1q).

(c) "Contracting agency" means a local governmental unit, as defined in s. 66.0903 (1) (d), a state agency, as defined in s. 103.49 (1) (f), or an owner or developer under s. 66.0904 that has contracted for the performance of work on a project.

(d) "Drug" means any controlled substance, as defined in s. 961.01 (4), or controlled substance analog, as defined in s. 961.01 (4m), for which testing is required by an employer under its substance abuse prevention program under this section.

(e) "Employee" means a laborer, worker, mechanic, or truck driver who performs the work described in s. 66.0903 (4), 66.0904 (3), or 103.49 (2m) on a project.

(f) "Employer" means a contractor, subcontractor, or agent of a contractor or subcontractor that performs work on a project.

(g) "Project" mean a project of public works that is subject to s. 66.0903 or 103.49 or a publicly funded private construction project that is subject to s. 66.0904.

**(2) SUBSTANCE ABUSE PROHIBITED.** No employee may use, possess, attempt to possess, distribute, deliver, or be under the influence of a drug, or use or be under the influence of alcohol, while performing the work described in s. 66.0903 (4), 66.0904 (3), or 103.49 (2m) on a project. An employee is considered to be under the influence of alcohol for purposes of this subsection if he or she has an alcohol concentration that is equal to or greater than the amount specified in s. 885.235 (1g) (d).

**(3) SUBSTANCE ABUSE PREVENTION PROGRAMS REQUIRED.** (a) Before an employer may commence work on a project, the employer shall have in place a written program for the prevention of substance abuse among its employees. At a minimum, the program shall include all of the following:

1. A prohibition against the actions or conditions specified in sub. (2).

2. A requirement that employees performing the work described in s. 66.0903 (4), 66.0904 (3), or 103.49 (2m) on a project submit to random, reasonable suspicion, and post-accident drug and alcohol testing and to drug and alcohol testing before commencing work on a project, except that testing of an employee before commencing work on a project is not required if the employee has been participating in a random testing program during the 90 days preceding the date on which the employee commenced work on the project.

3. A procedure for notifying an employee who violates sub. (2), who tests positive for the presence of a drug in his or her system, or who refuses to submit to drug or alcohol testing as required under the program that the employee may not perform work on a project until he or she meets the conditions specified in sub. (4) (b) 1. and 2.

(b) Each employer shall be responsible for the cost of developing, implementing, and enforcing its substance abuse prevention program, including the cost of drug and alcohol testing of its employees under the program. The contracting agency is not responsible for that cost, for the cost of any medical review of a test result, or for any rehabilitation provided to an employee.

**(4) EMPLOYEE ACCESS TO PROJECT.** (a) No employer may permit an employee who violates sub. (2), who tests positive for the presence of a drug in his or her system, or who refuses to submit to drug or alcohol testing as required under the employer's substance abuse prevention program under sub. (3) to perform work on a project until he or she meets the conditions specified in par. (b) 1. and 2. An employer shall immediately remove an employee from work on a project if any of the following occurs:

1. The employee violates sub. (2), tests positive for the presence of a drug in his or her system, or refuses to submit to drug or alcohol testing as required under the employer's substance abuse prevention program.

2. An officer or employee of the contracting agency has a reasonable suspicion that the employee is in violation of sub. (2) and requests the employer to immediately remove the employee from work on the project.

(b) An employee who is barred or removed from work on a project under par. (a) may commence or return to work on the project upon his or her employer providing to the contracting agency documentation showing all of the following:

1. That the employee has tested negative for the presence of drugs in his or her system and is not under the influence of alcohol as described in sub. (2).

2. That the employee has been approved to commence or return to work on the project in accordance with the employer's substance abuse prevention program.

(c) Testing for the presence of drugs or alcohol in an employee's system and the handling of test specimens shall be conducted in accordance with guidelines for laboratory testing procedures and chain-of-custody procedures established by the substance abuse and mental health services administration of the federal department of health and human services.

**(5) LOCAL ORDINANCES; STRICT CONFORMITY REQUIRED.** A local governmental unit, as defined in s. 66.0903 (1) (d), may enact an ordinance regulating the conduct regulated under this section only if the ordinance strictly conforms to this section.

History: 2005 a. 181; 2009 a. 28.

Consolidated List of Debarred Contractors  
Prepared and Issued By  
State of Wisconsin  
Department of Workforce Development

January 13, 2012

This list has been prepared in accordance with the provisions of s. 66.0903(12), s. 66.0904(10) and s. 103.49(7), Stats. and Chapter DWD 294 of the Wisconsin Administrative Code. All contractors on this list were found to have committed a "debarable offense" related to certain labor standard provisions determined or established for a state or local public works project or publicly funded private construction project. No state agency, local governmental unit or owner or developer may knowingly solicit bids from, negotiate with or award any contracts to or approve or allow any subcontracts with a debarred contractor, including all divisions, affiliates or other organizational elements of such contractor that are engaged in construction business activities, until the debarment is terminated. The name of each debarred contractor must remain on this list for a period of three (3) years from the termination date indicated below. The contractor is, however, only "debarred" from the "effective date" through the "termination date" indicated for that contractor. Questions regarding this list should be addressed to Julie Eckenwalder, Equal Rights Division, P. O. Box 8928, Madison, WI 53708 or call (608) 266-3148. Deaf, hearing or speech-impaired callers may contact the department by calling its TDD number (608) 264-8752.

<u>Name of Contractor</u>	<u>Address</u>	<u>Effective Date</u>	<u>Termination Date</u>	<u>Cause Code</u>	<u>Date of Violation(s)</u>	<u>Limitations/Deviations</u>
Atkins, Scott	See, Freedom Insulation, Inc					
Castlerock Commercial Construction, Inc.	PO Box 11699 Milwaukee, WI 53211-0699	2/1/12	1/31/15	1, 2 and 4	2009- 2010	None
Custom Heating & Air LLC	283 Tony Lane Green Bay, WI 54304	12/1/06	11/30/09	1, 2 and 4	2003- 2004	None
Dem/Ex Group, Inc	805 S Adams St Manito, IL 61546	12/1/11	11/30/14	1 and 2	2010	None
Fisher, Ed &/or Fisher, Rhonda	See, Dem/Ex Group, Inc					
Freedom Insulation, Inc	117925 219 <sup>th</sup> Ave Chippewa Falls, WI 54729	9/1/11	8/31/14	1	2008- 2010	None
Jenkins, Richard	See, Castlerock Commercial Construction, Inc.					
Joseph Stoller Company	N8426 Hwy 42 Algoma, WI 54201	2/1/07	1/31/10	1 and 2	2004 and 2005	None



<u>Name of Contractor</u>	<u>Address</u>	<u>Effective Date</u>	<u>Termination Date</u>	<u>Cause Code</u>	<u>Date of Violation(s)</u>	<u>Limitations/Deviations</u>
Keiver, David	See, Custom Heating & Air LLC	12/1/06	11/30/09	1, 2 and 4	2003 and 2004	None
Ofstie, Darin	See, Precision Excavating and Grading, LLC					
Precision Excavating and Grading, LLC or Precision Excavating Enterprises, LLC	2104 Pierce Saint Croix Rd Baldwin, WI 54002	5/1/11	4/30/14	1, 2 and 4	2006-2008	None
Stoller Enterprises LLC	N8426 Hwy 42 Algoma, WI 54201-9552	2/1/2007	1/31/2010	1 and 2	2005 to 2006	None
Stoller, Joseph	See, Joseph Stoller Company					
Stoller, Patrick J.	See, Stoller Enterprises LLC					

Cause Code: 1 = Failure to Pay Straight Time 2 = Failure to Pay Overtime 3 = Kickback 4 = Payroll Records.

## Disclosure of Ownership

The statutory authority for the use of this form is prescribed in Sections 66.0903(12)(d), 66.0904(10)(d) and 103.49(7)(d), Wisconsin Statutes.

The use of this form is mandatory. The penalty for failing to complete this form is prescribed in Section 103.005(12), Wisconsin Statutes.

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04(1) (m), Wisconsin Statutes]

- (1) On the date a contractor submits a bid to or completes negotiations with a state agency, local governmental unit, or developer, investor or owner on a project subject to Section 66.0903, 66.0904 or 103.49, Wisconsin Statutes, the contractor shall disclose to such state agency, local governmental unit, or developer, investor or owner, the name of any "other construction business", which the contractor, or a shareholder, officer or partner of the contractor, owns or has owned within the preceding three (3) years.
- (2) The term "other construction business" means any business engaged in the erection, construction, remodeling, repairing, demolition, altering or painting and decorating of buildings, structures or facilities. It also means any business engaged in supplying mineral aggregate, or hauling excavated material or spoil as provided by Sections 66.0903(3), 66.0904(2), 103.49(2) and 103.50(2), Wisconsin Statutes.
- (3) This form must **ONLY** be filed, with the state agency project owner, local governmental unit project owner, or developer, investor or owner of a publicly funded private construction project that will be awarding the contract, if **both (A) and (B) are met.**
  - (A) The contractor, or a shareholder, officer or partner of the contractor:
    - (1) Owns at least a 25% interest in the "other construction business", indicated below, on the date the contractor submits a bid or completes negotiations.
    - (2) Or has owned at least a 25% interest in the "other construction business" at any time within the preceding three (3) years.
  - (B) The Wisconsin Department of Workforce Development (DWD) has determined that the "other construction business" has failed to pay the prevailing wage rate or time and one-half the required hourly basic rate of pay, for

### Other Construction Business

Name of Business			
Street Address or P O Box	City	State	Zip Code
Name of Business			
Street Address or P O Box	City	State	Zip Code
Name of Business			
Street Address or P O Box	City	State	Zip Code
Name of Business			
Street Address or P O Box	City	State	Zip Code

**I hereby state under penalty of perjury that the information, contained in this document, is true and accurate according to my knowledge and belief.**

Print the Name of Authorized Officer			
Signature of Authorized Officer	Date Signed		
Name of Corporation, Partnership or Sole Proprietorship			
Street Address or P O Box	City	State	Zip Code

**If you have any questions call (608) 266-6861**

## Prime Contractor Affidavit of Compliance With Prevailing Wage Rate Determination

Authorization for this form is provided under Sections 66.0903(9)(c), 66.0904(7)(c) and 103.49(4r)(c) Wisconsin Statutes.

The use of this form is mandatory. The penalty for failing to complete this form is prescribed in Section 103.005(12), Wisconsin Statutes.

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04(1)(m), Wisconsin Statutes].

This form must **ONLY** be filed with the **Awarding Agency** indicated below.

State Of )	Project Name		
	DWD Determination Number	Project Number (if applicable)	
)SS	Date Determination Issued	Date of Contract	
County Of )	Awarding Agency		
	Date Work Completed		

After being duly sworn, the person whose name and signature appears below hereby states under penalty of perjury that

- **I am** the duly authorized officer of the corporation, partnership, sole proprietorship or business indicated below and have recently completed all of the work required under the terms and conditions of a contract with the above-named awarding agency and make this affidavit in accordance with the requirements set forth in Section 66.0903(9)(c), 66.0904(7)(c) or 103.49(4r)(c), Wisconsin Statutes and Chapter DWD 290 of the Wisconsin Administrative Code in order to obtain FINAL PAYMENT from such awarding agency.
- **I have** fully complied with all the wage and hour requirements applicable to this project, including all of the requirements set forth in the prevailing wage rate determination indicated above which was issued for such project by the Department of Workforce Development on the date indicated above.
- **I have** received the required affidavit of compliance from each of my agents and subcontractors that performed work on this project and have listed each of their names and addresses on page 2 of this affidavit.
- **I have** full and accurate records that clearly indicate the name and trade or occupation of every worker(s) that I employed on this project, including an accurate record of the hours worked and actual wages paid to such worker(s).
- **I will** retain the records and affidavit(s) described above and make them available for inspection for a period of at least three (3) years from the completion date indicated above at the address indicated below and shall not remove such records or affidavit(s) without prior notification to the awarding agency indicated above.

Name of Corporation, Partnership, Sole Proprietorship, Business, State Agency or Local Governmental Unit				
Street Address	City	State	Zip Code	Telephone Number
Print Name of Authorized Officer			Date Signed	
Signature of Authorized Officer				

## List of Agents and Subcontractors

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number			Telephone Number		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number			Telephone Number		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number			Telephone Number		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number			Telephone Number		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number			Telephone Number		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number			Telephone Number		

**If you have any questions call (608) 266-6861**

## Agent or Subcontractor Affidavit of Compliance With Prevailing Wage Rate Determination

Authorization for this form is provided under Sections 66.0903(9)(b), 66.0904(7)(b) and 103.49(4r)(9b), Wisconsin Statutes. The use of this form is mandatory. The penalty for failing to complete this form is prescribed in Section 103.005(12), Wisconsin Statutes.

Personal information you provide may be used for secondary purposes [Privacy Law, Section 15.04(1)(m), Wisconsin Statutes].

This form must **ONLY** be filed with the **Awarding Contractor** indicated below.

State Of _____ )  )SS  County Of _____ )	Project Name	
	DWD Determination Number	Project Number (if applicable)
	Date Determination Issued	Date of Subcontract
	Awarding Contractor	
	Date Work Completed	

After being duly sworn, the person whose name and signature appears below hereby states under penalty of perjury that

- **I am** the duly authorized officer of the corporation, partnership, sole proprietorship or business indicated below. We have recently completed all of the work required under the terms and conditions of a subcontract with the above-named awarding contractor. We make this affidavit in accordance with the requirements set forth in Section 66.0903(9)(b), 66.0904(7)(b) or 103.49(4r)(b), Wisconsin Statutes and Chapter DWD 290 of the Wisconsin Administrative Code in order to obtain FINAL PAYMENT from such awarding contractor.
- **I have** fully complied with the entire wage and hour requirements applicable to this project, including all of the requirements set forth in the prevailing wage rate determination indicated above which was issued for such project by the Department of Workforce Development on the date indicated above.
- **I have** received the required affidavit of compliance from each of my agents and subcontractors that performed work on this project and have listed each of their names and addresses on page 2 of this affidavit.
- **I have** full and accurate records that clearly indicate the name and trade or occupation of every worker(s) that I employed on this project, including an accurate record of the hours worked and actual wages paid to such worker(s).
- **I will** retain the records and affidavit(s) described above and make them available for inspection for a period of at least three (3) years from the completion date indicated above at the address indicated below and shall not remove such records or affidavit(s) without prior notification to the awarding contractor.

Name of Corporation, Partnership, Sole Proprietorship, Business, State Agency or Local Governmental Unit				
Street Address or PO Box	City	State	Zip Code	Telephone Number (    )
Print Name of Authorized Officer			Date Signed	
Authorized Officer Signature				

## List of Agents and Subcontractors

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number (     )			Telephone Number (     )		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number (     )			Telephone Number (     )		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number (     )			Telephone Number (     )		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number (     )			Telephone Number (     )		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number (     )			Telephone Number (     )		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number (     )			Telephone Number (     )		

**If you have any questions call (608) 266-6861**

# Request to Employ Subjourneyperson

The use of this form is mandatory. The penalty for failing to complete this form is prescribed in Section 103.005(12), Wisconsin Statutes. Personal information you provide may be used for secondary purposes (Privacy Law, s. 15.04(1)(m), Wisconsin Statutes). The employer indicated below requests that the Department of Workforce Development (DWD) determine the prevailing wage rate(s) and related qualifications to enable such employer to use a subjourneyperson(s) on the following prevailing wage project, in accordance with the provisions of Section DWD 290.025, Wisconsin Administrative Code.

1. Name of Project Appearing on the Project Determination	
County	City, Village or Town
DWD Project Determination Number	Project Number (if applicable)
2. Job Classification(s) for which you request a subjourney rate (i.e., carpenter, electrician, plumber, etc.)	
a.	
b.	
c.	
d.	
3. Employer Name (Print)	
Address	City State Zip Code
Telephone Number ( )	Requester Title
Email address (if you prefer to receive your response via email)	Fax Number (if you prefer to receive your response via fax) ( )

**READ CAREFULLY:** I understand that this request is ONLY applicable to the project and job classification(s) listed above and that subjourney employees primarily work under the direction of and assist a skilled trade employee by frequently using the tools of a skilled trade and will NOT regularly perform the duties of a general laborer, heavy equipment operator or truck driver. If the subjourney employee regularly performs the work of a different trade or occupation, he/she will be compensated for such work at the applicable journeyperson prevailing wage rate. I agree to compensate subjourney employees in strict accordance with the directions received from the DWD.

Requester Signature	Date Signed
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MAIL the completed request to:  
 EQUAL RIGHTS DIVISION, LABOR STANDARDS BUREAU  
 PO BOX 8928, MADISON WI 53708  
 OR

FAX the completed request to: (608) 267-0310 / DO NOT e-mail your request.  
 Call (608) 266-6861 for assistance in completing this form.

## PREVAILING WAGE – Public Entity Project Owners

Any public works project that has a total estimated project cost that equals or exceeds single-trade or multiple-trade project thresholds requires a prevailing wage rate determination issued by the Department of Workforce Development (DWD). Public works include erecting, constructing, remodeling, repairing, demolishing, alterations, painting and decorating projects for a local governmental unit or state agency. State law excludes minor service or maintenance work, warranty work, or work under a supply-and-installation contract. There is a statutory definition for each of these exclusions. The prevailing wage law that applies to local governmental units is §66.0903, Wis. Stats. The prevailing wage law that applies to state agencies is §103.49, Wis. Stats. The applicable administrative rules for all public entities are DWD 290 and DWD 294, Wis. Adm. Code.

### Thresholds

A “single-trade project of public works” means a project in which a single trade accounts for 85% or more of the total labor cost of the project. The single trade threshold is \$48,000.

A “multiple-trade project of public works” means a project in which no single trade accounts for 85% or more of the total labor cost of the project.

(a) The multiple-trade threshold is \$100,000, unless a municipality falls under the description in (b).

(b) The multiple-trade threshold of \$234,000 applies to public works projects erected, constructed, repaired, remodeled, or demolished by a private contractor for •a city or village with a population less than 2500 or •a town.

Effective July 1, 2011, a local governmental unit or state agency that has a public works project that equals or exceeds the prevailing wage thresholds must do all of the following:

- Request a prevailing wage rate determination for the project from DWD at least 30 days before soliciting bids or negotiating contracts. An Application for Prevailing Wage Rate Determination is available on the DWD website: [http://dwd.wisconsin.gov/er/prevailing\\_wage\\_rate/default.htm](http://dwd.wisconsin.gov/er/prevailing_wage_rate/default.htm)

To avoid waiting for a project determination use the on-line application system that permits the user to generate a determination immediately and save all documents in PDF form to the user’s computer. Use this project determination on line application at the following address:



[http://dwd.wisconsin.gov/er/prevailing\\_wage\\_rate/pw\\_online\\_determinations.htm](http://dwd.wisconsin.gov/er/prevailing_wage_rate/pw_online_determinations.htm)

- Tell potential contractors the project is subject to state prevailing wage law when soliciting bids.
- Include the prevailing wage rate determination in the construction contract, or if there is no written contract, provide a copy of the project determination to each prime contractor.
- Award contracts to contractors who do *not* appear on the “Consolidated List of Debarred Contractors.”
- Post the prevailing wage rate determination on the project site. (This document is often referred to as “the white sheet.”)
- Notify project contractors that if DWD finds that a contractor violated the prevailing wage law, DWD will assess liquidated damages of 100% of the wages owed to employees.
- Obtain an Affidavit of Compliance from each prime contractor before making final payment for the project.

If the total estimated cost of the project exceeds the prevailing wage thresholds, a local governmental unit or state agency also must obtain a prevailing wage rate determination under the following circumstances:

- when a completed facility is leased, purchased, lease-purchased or otherwise acquired by or dedicated to a public entity in lieu of the public entity contracting for the project,
- when one public entity does work for another public entity,
- when a *private* entity will construct a road, street, bridge, sanitary sewer or water main project and dedicate it to a local governmental unit or the state for its ownership or maintenance (except for some residential subdivisions).

For more information, visit the prevailing wage website: [http://dwd.wisconsin.gov/er/prevailing\\_wage\\_rate/default.htm](http://dwd.wisconsin.gov/er/prevailing_wage_rate/default.htm). For further assistance, call the Equal Rights Division at 608-266-6861 and ask for prevailing wage.

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## PREVAILING WAGE – Contractors

Any public works project that has a total estimated project cost that equals or exceeds prevailing wage project thresholds requires a prevailing wage rate determination issued by the Department of Workforce Development (DWD). Public works include erecting, constructing, remodeling, repairing, demolishing, alterations, painting and decorating projects for a local governmental unit or state agency. State law excludes minor service or maintenance work, warranty work, or work under a supply-and-installation contract. There is a statutory definition for each of these exclusions. The prevailing wage law that applies to local governmental units and their contractors is §66.0903, Wis. Stats. The prevailing wage law that applies to state agencies and their contractors is §103.49, Wis. Stats. The applicable administrative rules for all prevailing wage projects are DWD 290 and DWD 294, Wis. Adm. Code. These laws include provisions that apply to all contractors and subcontractors working on prevailing wage projects.

Effective July 1, 2011, any contractor or subcontractor working on a local governmental unit or state agency's public works project that equals or exceeds current prevailing wage project thresholds must do all of the following:

- Receive and review the project's prevailing wage rate determination (i.e., white sheet).
- Tell subcontractors the project is subject to state prevailing wage law and include the prevailing wage rate determination in the construction contract, or if there is no written contract, provide a copy of the project determination to each subcontractor.
- Hire subcontractors who do *not* appear on the "Consolidated List of Debarred Contractors."
- Notify subcontractors that if DWD finds that a contractor or subcontractor violated the prevailing wage law, DWD will assess liquidated damages of 100% of the wages owed to employees.

- Apply to DWD for subjourney wage rates prior to employing these individuals on the project.
- Receive and retain a completed Affidavit of Compliance from each subcontractor brought on to the project before providing final payment to those subcontractors.
- Submit a completed Affidavit of Compliance to the contractor who brought the subcontractor on to the project before receiving final payment for the project.
- Maintain payroll records for 3 years that comply with §§66.0903(10)(a) or 103.49(5)(a), Stats. and DWD 274.06.
- Respond to requests from DWD or the project owner to provide payroll records and/or respond to prevailing wage complaints filed by employees or third parties.

For more information, visit the prevailing wage website: [http://dwd.wisconsin.gov/er/prevailing\\_wage\\_rate/default.htm](http://dwd.wisconsin.gov/er/prevailing_wage_rate/default.htm). For further assistance, call the Equal Rights Division at 608-266-6861 and ask for prevailing wage.

## SUMMARY OF PREVAILING WAGE LAW CHANGES EFFECTIVE JULY 1, 2011

(This document updated 07/27/11)

For further updates on this topic, refer to the prevailing wage website at:  
[http://dwd.wisconsin.gov/er/prevailing\\_wage\\_rate/default.htm](http://dwd.wisconsin.gov/er/prevailing_wage_rate/default.htm)

The recently approved State budget bill (2011 Wisconsin Act 40) includes major changes to prevailing wage laws (§§66.0903, 66.0904, 103.49 & 103.50, Wis. Stats.) effective JULY 1, 2011. Significant changes are described below.

Topic	Who's affected?	Brief description of requirement under §66.0903 or §103.49
Thresholds	All public entities & Contractors	The \$25,000 threshold for public works projects has been changed to single-trade and multiple-trade project thresholds as noted below. The new thresholds apply to prevailing wage projects whose prime contract is awarded after June 30, 2011.
Non-applicability: Threshold for Single-Trade Projects	All public entities & Contractors	Any single-trade project of public works with an estimated cost of completion of less than \$48,000 does not require a prevailing wage rate determination. "Single-trade project of public works" means a project of public works in which a single trade accounts for 85 percent or more of the total labor cost of the project.
Non-applicability: Threshold for Multiple-Trade Projects	All public entities except cities, towns & villages as noted below & Contractors	Any multiple-trade project of public works with an estimated cost of completion of less than \$100,000 does not require a prevailing wage rate determination. "Multiple-trade project of public works" means a project of public works in which no single trade accounts for 85 percent or more of the total labor cost of the project.
Non-applicability: Threshold for Multiple-Trade Projects	Cities or villages with a population less than 2500 & Towns & Contractors	A multiple trade project of public works erected, constructed, repaired, remodeled, or demolished by a private contractor for a city or village with a population less than 2500, or a town with an estimated cost of completion of less than \$234,000 does not require a prevailing wage rate determination. "Multiple-trade project of public works" means a project of public works in which no single trade accounts for 85 percent or more of the total labor cost of the project.
Non-applicability: Minor service & maintenance work	Towns & Contractors	The following TOWN projects only do not require a prevailing wage rate determination: <ul style="list-style-type: none"> <li>• A project not funded under §86.31, Stats. (TRIP projects) that is limited to minor crack filling, chip or slurry sealing or other minor pavement patching, not including overlays.</li> <li>• The depositing of gravel on an existing gravel road applied solely to maintain the road;</li> <li>• Road shoulder maintenance;</li> <li>• Cleaning drainage or sewer ditches or structures;</li> <li>• Any other limited, minor work on public facilities or equipment that is routinely performed to prevent breakdown or deterioration.</li> </ul>
Non-applicability: Work which a contractor or individual donates to a public entity	All public entities	Prevailing wage laws §§66.0903 & 103.49, Stats., do not apply to work performed on a project of public works for which the local governmental unit or the state or the state agency contracting for the project is not required to compensate any contractor, subcontractor, contractor's or subcontractor's agent, or individual for performing the work.

<b>Topic</b>	<b>Who's affected?</b>	<b>Brief description of requirement under §66.0903 or §103.49</b>
<b>Non-applicability: Residential</b>	<b>All public entities</b>	A prevailing wage rate determination is not required for the erection, construction, repair, remodeling, or demolition of a residential property containing 2 dwelling units or less.
<b>Non-applicability: Residential subdivision infrastructure</b>	<b>All public entities</b>	A prevailing wage rate determination is not required for a road, street, bridge, sanitary sewer, or water main project that is a part of a development in which at least 90 percent of the lots contain or will contain 2 dwelling units or less, as determined by the local governmental unit at the time of approval of the development, and that, on completion, is acquired by, or dedicated to, a local governmental unit (including under §236.13(2), Stats.), or the state, for ownership or maintenance by the local governmental unit or the state.
<b>Non-applicability: Certain nursing homes</b>	<b>All public entities</b>	Prevailing wage law §66.0903, Stats., does not apply to a project of public works involving the erection, construction, repair, remodeling, or demolition of a nursing home in a county having a population of less than 50,000 when the project commences no later than July 1, 2012.
<b>Electronic certified payroll record</b>	<b>Contractors</b>	The requirement that every contractor on a prevailing wage project submit to DWD monthly a certified record of employees who worked on the project and that DWD post these certified records on its Internet website is discontinued effective July 1, 2011. However, contractors who worked on prevailing wage projects during the period January 1, 2010 through June 30, 2011, must comply with the repealed law for work completed on projects during that period of time.
<b>Payroll record inspection request by any person</b>	<b>Contractors &amp; Complainants</b>	Any person may request DWD to inspect the payroll records of any contractor working on a prevailing wage project. On receipt of such a request, the contractor must submit to DWD a certified record of its payroll records, other than personally identifiable information relating to an employee of the contractor, for no longer than a 4-week period. DWD may request records from a contractor under this provision no more than once per calendar quarter for each project of public works on which the contractor is performing work. The department may not charge a requester a fee for obtaining that information. DWD must make these certified records available for public inspection.
<b>Complaints</b>	<b>Complainants</b>	There are no longer investigation fees.
<b>Statewide uniformity</b>	<b>Local governmental units</b>	A local governmental unit may not enact & administer a prevailing wage ordinance/provision for public works or publicly funded private construction projects. Any extant laws to that effect are void.

Topic	Who's affected?	Brief description of requirement under §66.0903, §103.49 or §103.50
Covered employees	Truck drivers & Other workers & Contractors	<p>A laborer, worker, mechanic, or truck driver who is employed to process, manufacture, pick up, or deliver materials or products from a commercial establishment that has a fixed place of business from which the establishment supplies processed or manufactured materials or products or from a facility that is not dedicated exclusively, or nearly so, to a project of public works is NOT entitled to receive the prevailing wage rate UNLESS any of the following applies:</p> <ol style="list-style-type: none"> <li>1) the laborer, worker, mechanic, or truck driver is employed to go to the source of mineral aggregate such as sand, gravel, or stone and deliver that mineral aggregate to the site of a project of public works by depositing the material directly in final place, from the transporting vehicle or through spreaders from the transporting vehicle.</li> <li>2) the laborer, worker, mechanic, or truck driver is employed to go to the site of a project of public works, pick up excavated material or spoil from the site of the project, and transport that excavated material or spoil away from the site of the project.</li> </ol>
Annual Prevailing Wage Survey	All public entities	When establishing yearly prevailing wage rates, DWD may not use data from any construction work that is performed by a local governmental unit or a state agency.
Prevailing Wage Rates	DOT & Contractors & Employees	For state highway prevailing wage rates, DWD is required to include wage rates for work performed on Sundays, holidays and shift differentials based on the time of day or night when work is performed.
<p>The 2009-2011 State budget bill (2009 Wisconsin Act 28) created a new prevailing wage law (§66.0904, Wis. Stats.) for PUBLICLY FUNDED PRIVATE CONSTRUCTION PROJECTS effective January 1, 2010. The current 2011-2013 State budget bill (2011 Wisconsin Act 32) REPEALS this law. So the publicly funded private construction projects law only applies to projects that awarded the prime contract during the period January 1, 2010 through June 30, 2011.</p>		

**SINGLE & MULTIPLE TRADE PROJECT THRESHOLDS  
FOR §§66.0903 & 103.49, Wis. Stats.  
Effective July 1, 2011**

The \$25,000 threshold for public works projects has been changed to single-trade and multiple-trade project thresholds as described below. Projects of public works with total estimated costs of completion that equal or exceed these thresholds require a prevailing wage rate determination.

**SINGLE-TRADE THRESHOLD**

A “single-trade project of public works” means a project in which a single trade accounts for 85 percent or more of the total labor cost of the project.

The single trade threshold is \$48,000.

**MULTIPLE-TRADE THRESHOLDS**

A “multiple-trade project of public works” means a project in which no single trade accounts for 85 percent or more of the total labor cost of the project.

(a) The multiple-trade threshold is \$100,000, unless a municipality falls under the description in (b).

(b) The multiple-trade threshold of \$234,000 applies to public works projects erected, constructed, repaired, remodeled, or demolished by a private contractor for:

- a city or village with a population less than 2500, or
- a town

**APPLYING THE NEW THRESHOLDS**

The department will apply the new single-trade & multiple-trade prevailing wage thresholds to projects of public works for which the prime contract is awarded on or after July 1, 2011.

SECTION 01 00 00  
BASIC REQUIREMENTS

PART 1 GENERAL

1.1 SECTION SUMMARY

- A. Section Includes:
1. Section Summary
  2. Summary of the Work
  3. Contractor Use of Premises
  4. Applications for Payment
  5. Alternates
  6. Coordination
  7. Cutting and Patching
  8. Conferences
  9. Progress Meetings
  10. Submittal Procedures
  11. Proposed Products List
  12. Shop Drawings
  13. Product Data
  14. Samples
  15. Manufacturers' Instructions
  16. Manufacturers' Certificates
  17. Quality Assurance / Quality Control of Installation
  18. References
  19. Protection of Installed Work
  20. Parking
  21. Staging Areas
  22. Occupancy During Construction and Conduct of Work
  23. Protection
  24. Progress Cleaning
  25. Products
  26. Transportation, Handling, Storage and Protection
  27. Product Options
  28. Substitutions
  29. Starting Systems
  30. Demonstration and Instructions
  31. Contract Closeout Procedures
  32. Final Cleaning
  33. Adjusting
  34. Operation and Maintenance Data
  35. Spare Parts and Maintenance Materials
  36. Record Drawings and Specifications



## 1.2 SUMMARY OF THE WORK

- A. Project Description: Perform the Work as specified and detailed in Construction Documents package. Contractor to provide Phase 2 tasks including:
1. Babcock Park Lock & Dam:
    - a. Replace four (4) lock gates;
    - b. Refurbish manual lock controls;
    - c. Repair lock sills;
    - d. Repair lock gate pins;
    - e. Repair above water concrete;
    - f. Replace existing concrete deck with new metal deck;
    - g. Replace two (2) stop log chambers with two (2) new mechanized weir gates;
    - h. Provide new electrical motors and associated controls for weir gates;
    - i. Provide outdoor control cabinet for mechanical / electrical systems;
    - j. Remove existing railings and provide new fencing; and
    - k. Provide two (2) flow monitoring cameras & associated communications.
  2. LaFollette Park Lock & Dam:
    - a. Replace four (4) lock gates;
    - b. Refurbish manual lock controls;
    - c. Repair lock sills;
    - d. Repair lock gate pins;
    - e. Repair above water concrete;
    - f. Replace existing concrete deck with new metal deck;
    - g. Replace one (1) stop log chamber with new mechanized weir gate;
    - h. Provide new electrical motor and associated controls for weir gate;
    - i. Provide indoor control cabinet for mechanical / electrical systems in existing shed;
    - j. Remove existing railings and provide new fencing;
    - k. Provide electrical upgrades to existing shed; and
    - l. Provide two (2) flow monitoring cameras & associated communications.
- B. Phase 1 Work (Not In Contract): This will include scour repairs (LaFollette only), concrete repairs and concrete pier extensions to the lock and dam structures at Babcock and LaFollette Parks. These repairs will be done by underwater methods and preplaced aggregate. This work may happen concurrently with the Phase 2 Work.
- C. Work by Owner: At both sites, repair or replace lock gate bottom pin and shoe assemblies, electrical service to & including transformers; poles for mounting flow monitoring cameras; and site light fixtures. Refer to Instructions to Bidders, Section 19.
- D. Permits: Prior to commencement of the Work, Contractor to secure any and all necessary permits for completion of the Work and facility occupancy.

## 1.3 CONTRACTOR USE OF PREMISES

- A. Limit use of premises to allow work by Contractors or Subcontractors and access by Owner.

#### 1.4 APPLICATIONS FOR PAYMENT

- A. Submit two (2) copies of each application on AIA G702™ and G703™ forms or approved contractors invoice form.
- B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.
- C. Payment Period: Monthly.

#### 1.5 ALTERNATES

- A. Alternates quoted on Bid Form shall be reviewed and accepted or rejected at the Owner's option.
- B. Coordinate related work and modify surrounding work as required.
- C. Schedule of Alternates:
  - 1. Babcock Remote Controls and Cameras.
    - a. Add price for providing new remote operation controls and associated gate height monitoring cameras on two of the four weir gates at Babcock dam. Refer especially to Section 35 20 19.
  - 2. LaFollette Remote Controls and Cameras.
    - a. Add price for providing new remote operation controls and associated gate height monitoring camera on one of the three weir gates at LaFollette dam. Refer especially to Section 35 20 19.
  - 3. Babcock Mechanization, Remote Control and Camera.
    - a. Add price for providing weir gate mechanization, remote operation controls & associated gate height monitoring camera on the third of the four weir gates at Babcock dam. Refer especially to Sheet S-10 & Sections 35 20 18 & 35 20 19.
  - 4. LaFollette Mechanization, Remote Control and Camera.
    - a. Add price for providing new remote operation controls and associated gate height monitoring camera on one of the three weir gates at LaFollette dam. Refer especially to Sheet S-10 & Sections 35 20 18 & 35 20 19.
  - 5. Babcock Fishing Platform and Walkway.
    - a. Add price for providing fishing platform & walkway at Babcock Park. Refer especially to Sheets C-2, C-5, & S-12 & Sections 05 50 13, 32 01 00, 32 11 23 & 32 12 16.
  - 6. LaFollette Fishing Platform and Walkway.
    - a. Add price for providing fishing platform & walkway at LaFollette Park. Refer especially to Sheets C-4, C-5, & S-12 & Sections 05 50 13, 32 01 00, 32 11 23 & 32 12 16.
  - 7. Babcock Hydraulic Lock Controls.
    - a. Add price for omitting refurbishing manual lock controls & outdoor control cabinet in Base Bid and instead provide hydraulic lock controls and associated control panel in new equipment shed at Babcock lock. Refer especially to Sheet M-2 & Section 35 20 17.

8. LaFollette Hydraulic Lock Controls
  - a. Add price for omitting refurbishing manual lock controls & outdoor control cabinet in Base Bid and instead provide hydraulic lock controls and associated control panel in existing storage shed at LaFollette lock. Refer especially to Sheet M-2 & Section 35 20 17).

#### 1.6 COORDINATION

- A. Coordinate scheduling, submittals, and work of various sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements.
- B. Verify utility requirement characteristics of operating equipment are compatible with building utilities.
- C. Coordinate space requirements and installation of mechanical and electrical work that are indicated diagrammatically on Drawings.

#### 1.7 CUTTING AND PATCHING

- A. Employ a skilled and experienced installer to perform cutting and patching new work; restore work with new Products.
- B. Submit written request in advance of cutting or altering structural or building enclosure elements.
- C. Fit work tight to adjacent elements. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- D. Refinish surfaces to match adjacent finishes.

#### 1.8 CONFERENCES

- A. Dane County Department Public Works, Highway & Transportation will schedule a preconstruction conference after Award of Contract for all affected parties.
- B. When required in individual Specification section, convene a pre-installation conference at project site prior to commencing work of the section.

#### 1.9 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at minimum of one (1) per week.
- B. Preside at meetings, record minutes, and distribute copies within two (2) days to those affected by decisions made.

#### 1.10 SUBMITTAL PROCEDURES

- A. Submittal form to identify Project, Contractor, Subcontractor or supplier; and pertinent Construction Documents references.
- B. Apply Contractor's stamp, signed or initialed, certifying that review, verification of Products required, field dimensions, adjacent construction work, and coordination of information is in accordance with requirements of the Work and Construction Documents.
- C. Identify variations from Construction Documents and Product or system limitations that may be detrimental to successful performance of completing the Work.
- D. Revise and resubmit submittals as required; identify all changes made since previous submittal.

#### 1.11 PROPOSED PRODUCTS LIST

- A. Within fifteen (15) days after date of Award of Contract, submit complete list of major Products proposed for use, with name of manufacturer, trade name, and model number of each Product.

#### 1.12 SHOP DRAWINGS

- A. Submit number of copies that Contractor requires, plus two (2) copies that shall be retained by Public Works Project Engineer.

#### 1.13 PRODUCT DATA

- A. Submit number of copies that Contractor requires, plus two (2) copies that shall be retained by Public Works Project Engineer.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this Project.

#### 1.14 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of the Product.
- B. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Public Works Project Engineer's selection.

#### 1.15 MANUFACTURERS' INSTRUCTIONS

- A. When specified in individual Specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.

1.16 MANUFACTURERS' CERTIFICATES

- A. When specified in individual Specification sections, submit manufacturers' certificate to Public Works Project Engineer for review, in quantities specified for Product Data.
- B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

1.17 QUALITY ASSURANCE / QUALITY CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply fully with manufacturers' instructions.
- C. Comply with specified standards as minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

1.18 REFERENCES

- A. Conform to reference standard by date of issue current as of date for receiving bids.
- B. Should specified reference standard conflict with Construction Documents, request clarification from Public Works Project Engineer before proceeding.

1.19 PROTECTION OF INSTALLED WORK

- A. Protect installed work and provide special protection where specified in individual Specification sections.

1.20 PARKING

- A. Arrange for temporary parking areas to accommodate construction personnel. Parking shall be available at the Work site.

1.21 STAGING AREAS

- A. Coordinate staging areas with Public Works Project Engineer prior to starting the Work.
- B. On-site space for use as staging areas and storage of materials is limited and will be apportioned among the various Contractors as their needs dictate with due regard for storage requirements of each Contractor. Each Contractor shall be responsible for safety of equipment and materials that are stored on site.

1.22 OCCUPANCY DURING CONSTRUCTION AND CONDUCT OF WORK

- A. Contractor shall, at all times, provide approved, safe walkways and facility entrances for use by Owner, employees and public.

- B. Contractor shall provide adequate protection for all parts of facility, its contents and occupants wherever the Work under this contract is to be performed.
- C. Each Contractor shall arrange with Owner to make necessary alterations, do new work, make connections to all utilities, etc., at such times as will not cause interruption of utility services to facility. Contractor doing this work shall protect, cap, cut off and / or replace and relocate existing pipes, electrical work and other active utilities encountered which may interfere with new construction work.
- D. New work in extension of existing work shall correspond in all respects with that to which it connects or similar existing work unless otherwise indicated or specified.
  - 1. Existing work shall be cut, altered, removed or replaced as necessary for performance of contract obligations.
  - 2. Work remaining in place, damaged or defaced by reason of work done under this contract shall be restored equal to its condition at time of Award of Contract.
  - 3. If removal of work exposes discolored or unfinished surfaces or work out of alignment, such surfaces shall be refinished or materials replaced as necessary to make continuous work uniform and harmonious.

#### 1.23 PROTECTION

- A. Contractor shall protect from injury all trees, shrubs, hedges, walks and driveways and pay for any damage to same resulting from insufficient or improper protection.
- B. Guard Light: Contractor shall provide and maintain guard lights at all barricades, railings, obstructions in streets, roads or sidewalks and at all trenches adjacent to public walks or roads.

#### 1.24 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition.

#### 1.25 PRODUCTS

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work, but does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components specifically identified for reuse.
- B. Do not use materials and equipment removed from existing premises, except as specifically identified or allowed by Construction Documents.

#### 1.26 TRANSPORTATION, HANDLING, STORAGE AND PROTECTION

- A. Transport, handle, store and protect Products in accordance with manufacturer's instructions.

#### 1.27 PRODUCT OPTIONS

- A. Where definite material is specified, it is not intention to discriminate against "equal" product made by another manufacturer. Intention is to set definite standard of material quality. Should bidder choose to bid materials other than those specified, bidder shall submit said materials specifications to Public Works Project Engineer for approval at least seven (7) days prior to Bid Due Date.
- B. Products and materials that are not specified, but have been approved for use by Public Works Project Engineer shall be identified in addenda to all bidding contractors.
- C. Requests for material or product substitutions submitted after Bid Due Date may be considered. Owner reserves right to approve or reject substitutions based on Specification requirements and intended use.

#### 1.28 SUBSTITUTIONS

- A. Public Works Project Engineer shall consider requests for Substitutions only within fifteen (15) days after date of Public Works Contract.
- B. Document each request with complete data substantiating compliance of proposed Substitution with Construction Documents.
- C. Submit three (3) copies of requests for Substitution for consideration. Limit each request to one (1) proposed Substitution.
- D. Substitutions shall not change contract price established at Bid Due Date.

#### 1.29 STARTING SYSTEMS

- A. Provide written notification prior to start-up of each equipment item or system.
- B. Ensure that each piece of equipment or system is ready for operation.
- C. Execute start-up under supervision of responsible persons in accordance with manufacturers' instructions.
- D. Submit written report that equipment or system has been properly installed and is functioning correctly.

#### 1.30 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of Products to Owner's personnel prior to date of final inspection.
- B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at designated location.

- C. Owner may choose to videotape demonstration session; demonstration and demonstrator shall be to level of satisfaction of Owner.

#### 1.31 CONTRACT CLOSEOUT PROCEDURES

- A. Submit written certification that Construction Documents have been reviewed, the Work has been inspected, and the Work is complete in accordance with Construction Documents and ready for Public Works Project Engineer's inspection.
- B. Submit final Application for Payment identifying total adjusted Contract Sum / Price, previous payments, and amount remaining due.

#### 1.32 FINAL CLEANING

- A. Execute final cleaning prior to final inspection.
- B. Clean interior and exterior surfaces exposed to view.
- C. Remove waste and surplus materials, rubbish, and construction facilities from site.

#### 1.33 ADJUSTING

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

#### 1.34 OPERATION AND MAINTENANCE DATA

- A. Provide operation and maintenance data for all mechanical and electrical equipment supplied and installed in project.

#### 1.35 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide Products, spare parts, maintenance and extra materials in quantities specified in individual Specification Sections.
- B. Deliver to the Work site and place in location as directed.

#### 1.36 RECORD DRAWINGS AND SPECIFICATIONS

- A. Contractor-produced Drawings and Specifications shall remain property of Contractor whether Project for which they are made is executed or not. Contractor shall furnish Public Works Project Engineer with original tracings of drawings and prints of specifications in reproducible format, one set of Drawings and Specifications and one set of record drawings in AutoCAD 2007 (or lower) format and entire record specification in Word 2000 (or lower) format on CD.

### PART 2 PRODUCTS

Not Used.



PART 3 EXECUTION

Not Used.

END OF SECTION

## SECTION 01 74 19

### RECYCLING

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Waste Management Goals
  - 2. Waste Management Plan
  - 3. Reuse
  - 4. Recycling
  - 5. Materials Sorting and Storage On Site
  - 6. Lists of Recycling Facilities Processors and Haulers
  - 7. Waste Management Plan Form
  
- B. Related Sections:
  - 1. Section 01 00 00 - Basic Requirements

##### 1.2 WASTE MANAGEMENT GOALS

- A. Dane County requires that as many waste materials as possible produced as result of this project be salvaged, reused or recycled in order to minimize impact of construction waste on landfills and to minimize expenditure of energy and cost in fabricating new materials. Additional information may be found in The Dane County Green Building Policy, Resolution 299, 1999-2000.
  
- B. Contractor shall develop, with assistance of Public Works Project Engineer and Architect / Engineer, Waste Management Plan (WMP) for this project. Outlined in RECYCLING section of this specification are examples of materials that can be recycled or reused as well as recommendations for waste sorting methods.

##### 1.3 WASTE MANAGEMENT PLAN

- A. Contractor shall complete WMP and include cost of recycling / reuse in Bid. WMP will be submitted to Public Works Project Engineer within fifteen (15) days of Notice to Proceed date. Copy of blank WMP form is in this Section. Submittal shall include cover letter and WMP form with:
  - 1. Information on:
    - a. Types of waste materials produced as result of work performed on site;
    - b. Estimated quantities of waste produced;
    - c. Identification of materials with potential to be recycled or reused;
    - d. How materials will be recycled or reused;
    - e. On-site storage and separation requirements (on site containers);
    - f. Transportation methods; and
    - g. Destinations.

#### 1.4 REUSE

- A. Contractors and subcontractors are encouraged to reuse as many waste materials as possible. Salvage should be investigated for materials not reusable on site.

#### 1.5 RECYCLING

- A. These materials can be recycled in Dane County area:
  1. Wood.
  2. Wood Pallets.
  3. Fluorescent Lamps.
  4. Foam Insulation & Packaging (extruded and expanded).
  5. PVC Plastic (pipe, siding, etc.).
  6. Asphalt & Concrete.
  7. Bricks & Masonry
  8. Corrugated Cardboard.
  9. Metal.
  10. Carpet Padding.
  11. Gypsum Drywall.
  12. Shingles.
  13. Barrels & Drums.
  14. Solvents.

#### 1.6 MATERIALS SORTING AND STORAGE ON SITE

- A. Contractor shall provide separate containers for recyclable materials. Number of containers will be dependent upon project and site conditions.
- B. Contractor shall provide on-site locations for subcontractors supplied recycling containers to help facilitate recycling.

#### 1.7 LISTS OF RECYCLING FACILITIES PROCESSORS AND HAULERS

- A. Web site [www.countyofdane.com/pwht/recycle/categories.aspx](http://www.countyofdane.com/pwht/recycle/categories.aspx) lists current information for Dane County Recycling Markets. Contractors can also contact Dane County's Recycling Manager at 608/267-8815, or local city, village, town recycling staff listed at site [www.countyofdane.com/pwht/recycle/contacts.aspx](http://www.countyofdane.com/pwht/recycle/contacts.aspx). Statewide listings of recycling / reuse markets are available from Wisconsin Department of Natural Resources, [www.dnr.state.wi.us/org/aw/wm/markets](http://www.dnr.state.wi.us/org/aw/wm/markets).

1.8 WASTE MANAGEMENT PLAN FORM

A. Contractor Information:

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

Address: \_\_\_\_\_

Phone No.: \_\_\_\_\_ Recycling Coordinator: \_\_\_\_\_

MATERIAL	ESTIMATED QUANTITY	DISPOSAL METHOD (CHECK ONE)		RECYCLING / REUSE COMPANY OR DISPOSAL SITE
Salvaged & reused building materials	_____ cu. yds. _____ tons	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Glass	_____ cu. yds. _____ tons	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Wood	_____ cu. yds. _____ tons	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Wood Pallets	_____ units	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Fluorescent Lamps	_____ cu. ft. _____ lbs.	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Foam Insulation	_____ cu. ft. _____ lbs.	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Asphalt & Concrete	_____ cu. ft. _____ lbs.	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Bricks & Masonry	_____ cu. ft. _____ lbs.	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
PVC Plastic	_____ cu. ft. _____ lbs.	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Corrugated Cardboard	_____ cu. ft. _____ lbs.	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Metals	_____ cu. yds. _____ tons	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Carpet Padding	_____ cu. ft. _____ lbs.	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	
Gypsum / Drywall	_____ cu. yds. _____ tons	_____ Recycled	_____ Reused	Name: _____
		_____ Landfilled	_____ Other	

Shingles	_____ cu. yds. _____ tons	_____ Recycled _____ Landfilled	_____ Reused _____ Other	Name: _____
Barrels & Drums	_____ units	_____ Recycled _____ Landfilled	_____ Reused _____ Other	Name: _____
Solvents	_____ gallons	_____ Recycled _____ Landfilled	_____ Reused _____ Other	Name: _____
Other	_____	_____ Recycled _____ Landfilled	_____ Reused _____ Other	Name: _____
Other	_____	_____ Recycled _____ Landfilled	_____ Reused _____ Other	Name: _____
Other	_____	_____ Recycled _____ Landfilled	_____ Reused _____ Other	Name: _____
Other	_____	_____ Recycled _____ Landfilled	_____ Reused _____ Other	Name: _____
Other	_____	_____ Recycled _____ Landfilled	_____ Reused _____ Other	Name: _____

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

## SECTION 02 41 13

### SITE DEMOLITION

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Identify, disconnect, cap, and remove designated electric and mechanical utilities.
  - 2. Demolish and remove designated site structures and.
  - 3. Demolish and remove designated pavements.
  - 4. Remove designated fencing system.
  - 5. Owner retained material.
  - 6. Material scheduled for re-installation.
  - 7. Remove demolition materials from site.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01 –Basic Requirements shall govern Work under this Section.
  - 2. Section 02 41 19 – Selective Demolition.
  - 3. Section 31 05 13 – Soils for Earthwork: Subsoil backfill material.
  - 4. Section 31 05 16 – Aggregates for Earthwork: Granular backfill material.

##### 1.2 SUBMITTALS

- A. Submit project record documents under provisions of Division 01 – Basic Requirements: Submittal Procedures.
  - 1. Record drawings should accurately identify location of utilities capped off or abandoned in place, location of foundations or appurtenances abandoned and covered, or items remaining that would affect future work on site.

##### 1.3 REGULATORY REQUIREMENTS

- A. Comply with local, state, and federal codes, rules and regulations applicable to demolition work including but not limited to erosion control, air pollution, noise pollution, and waste disposal.

##### 1.4 PROJECT SITE CONDITIONS

- A. Conduct demolition to minimize interference with adjacent structures.
- B. Provide, erect, and maintain temporary barriers and security devices.
- C. Conduct operations with minimum interference to public or private thoroughfares.

- D. Do not close or obstruct roadways without permits.

#### 1.5 SITE DEMOLITION REQUIREMENTS

##### A. Traffic Control Signs:

1. Where pedestrian and driver safety is endangered in area of removal work, use traffic barricades with flashing lights.

##### B. Items to Remain in Place:

1. Take necessary precautions to avoid damage to existing items scheduled to remain in place, to be reused, or to remain property of Owner.
2. Repair or replace damaged items as approved by Engineer and Owner's Representative.
3. Construct and maintain shoring, bracing, and supports as required.
4. Ensure that structural elements are not overloaded. Increase structural supports or add new supports as may be required as a result of any cutting, removal, or demolition work performed.
5. Do not overload structural elements or pavements to remain.
6. Repairs, reinforcement, or structural replacement require approval by Engineer prior to performing such work.

##### C. Existing Conditions:

1. Before beginning any demolition work, survey project site and examine drawings and specifications to determine extent of demolition work.
2. Protect trees within project site which might be damaged during demolition, and which are indicated to be left in place.
3. Replace any tree designated to remain that is damaged during the work under this contract with like and kind or as approved by Owner's Representative.
4. Maintain existing utilities indicated to stay in service and protect against damage during demolition operations.
5. Prior to start of work, utilities serving each area of alteration or removal will be shut off by Utility Owner and disconnected and sealed by Contractor.

#### 1.6 HAZARDOUS MATERIALS

- A. If Contractor encounters a hazardous material during demolition process, it shall cease operations immediately and notify Owner and Engineer of its findings.
- B. Owner will employ a Contractor, experienced and certified in removal and disposal of hazardous substances to perform removal and disposal work.
- C. Contractor shall not reinstate demolition operations until areas have been cleared for continuation of demolition work.

### PART 2 PRODUCTS

Not Used

## **PART 3 EXECUTION**

### **3.1 NOTIFICATION**

- A. Contractor, prior to any excavation work, shall notify (1) a designated locating service; (2) all utilities, governmental agencies, entities, known to, or which can reasonably be assumed to have above or below ground pipe, conduit cables, structures, or similar items within limits of project; to locate and mark location of such items.
- B. In accordance with Wisconsin Statute 182.0175, "Damage to Transmission Facilities," Excavator, as defined in 182.0175(1)(bm), shall be solely responsible to provide advance notice to "Diggers Hotline, Inc." (800-242-8511) not less than three working days prior to commencement of any Excavation, as defined in the statute, required to perform work contained in this Project, and further, Excavator shall comply with all other requirements of this Statute relative to Excavation.

### **3.2 PREPARATION**

- A. Prevent movement or settlement of adjacent structures scheduled to remain.
- B. Provide bracing and shoring of adjacent structures scheduled to remain.
- C. Protect existing landscaping materials, appurtenances and structures which are not to be demolished.
- D. Disconnect, cap, and remove designated utility lines, including electrical services within demolition areas.
- E. Cooperate and work with local utility company to provide disconnection of designated electrical services.
- F. Mark location of disconnected utilities. Identify utilities and indicate capping locations on Project Record Documents.

### **3.3 DEMOLITION AND REMOVAL**

- A. Except where specified in other sections, all materials and equipment removed, and not reused or salvaged shall become property of the Contractor.
- B. Demolish designated structures, pavements, fences, signage and appurtenances in accordance with removal procedure and schedule.
- C. Cease operations and notify Engineer and Owner's Representative immediately if adjacent structures or landscape features appear to be endangered.
- D. Do not resume operations until corrective measures have been taken.



- E. Immediately remove demolished material from site unless approved demolition procedure and schedule submitted in accordance with this section provides otherwise.
- F. Relics, antiques, and similar objects remain property of Owner.
- G. Notify Engineer prior to removal and obtain acceptance regarding method of removal.
- H. Remove materials to be re-installed or retained in manner to prevent damage.
  - 1. Remove, store, and protect for re-installation following materials and equipment:
    - a. Lock controls.
  - 2. Store and protect under provisions of Division 01 – Basic Requirements: Transportation, Handling, Storage and Protection.
- I. Remove following material and equipment to be retained by Owner and deliver to Owner.
  - 1. Stop logs.
- J. Remove following material and equipment disposal off-site.
  - 1. Lock gates.
- K. Remove and promptly dispose of contaminated, vermin infested, or dangerous materials encountered.
- L. Do not burn or bury materials on site.
- M. Demolish and remove designated concrete pavement completely which includes:
  - 1. Concrete deck.
- N. Demolish and remove designated asphalt pavement completely which includes:
  - 1. Sidewalks.
- O. Neatly saw cut pavement edges at right angle to surface to complete depth of pavement prior to shattering or mechanical removal.
- P. Keep work sprinkled to minimize dust. Provide hoses and water main or hydrant connections for this purpose. Obtain permits and pay for water usage as required by Local Water Utility.
- Q. Backfill areas excavated, open pits, and holes caused as a result of demolition with Type S2 subsoil specified in Section 31 05 13.
- R. Rough grade and compact areas affected by sidewalk demolition to maintain and blend site grades and contours as indicated on Drawings.

**END OF SECTION**

## SECTION 02 41 19

### SELECTIVE DEMOLITION

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Demolition and removal of selected portions of structure.
  - 2. Demolition and removal of selected site elements.
  - 3. Repair procedures for selective demolition operations.
- B. Related Sections:
  - 1. Applicable provisions of Division 01 - Basic Requirements shall govern Work under this Section.

##### 1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

##### 1.3 REFERENCES

- A. American National Standards Institute (ANSI)
  - 1. ANSI A10.6 - Safety Requirements for Demolition Operations.

##### 1.4 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

##### 1.5 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal Procedures: Requirements for submittals.
- B. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project

names and addresses, names and addresses of architects and owners, and other information specified.

- C. Schedule of Selective Demolition Activities: Indicate the following:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
  - 2. Interruption of utility services.
  - 3. Coordination for shutoff, capping, and continuation of utility services.
  - 4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- D. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.

## 1.6 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI A10.6.
- C. Review methods and procedures related to selective demolition including, but not limited to, the following:
  - 1. Inspect condition of construction to be selectively demolished.
  - 2. Review structural load limitations of existing structure.
  - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

## 1.7 PROJECT CONDITIONS

- A. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  - 1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Owner's Representative and Owner. Hazardous materials will be removed by Owner under a separate contract.
- B. Storage or sale of removed items or materials on-site will not be permitted.
- C. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

## **PART 2 PRODUCTS**

### **2.1 REPAIR MATERIALS**

- A. Use repair materials identical to existing materials.
  - 1. Use materials whose installed performance equals or surpasses that of existing materials.
- B. Comply with material and installation requirements specified in individual Specification Sections.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure nature and extent of conflict. Promptly submit a written report to Engineer and Owner's Representative.
- E. Perform structure movement surveys as the Work progresses to detect hazards resulting from selective demolition activities.

### **3.2 UTILITY SERVICES**

- A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.
- B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.
  - 1. Provide at least 72 hours notice to Owner if shutdown of service is required during changeover.
- C. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.
  - 1. Arrange to shut off indicated utilities with utility companies.
  - 2. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition, provide temporary utilities that bypass area of selective demolition and that maintain continuity of service.

3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

### 3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
  2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by Owner or authorities having jurisdiction.
  3. Protect existing site improvements, appurtenances, and landscaping to remain.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  1. Provide protection to ensure safe passage of people around selective demolition area.

### 3.4 POLLUTION CONTROLS

- A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
  1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
- B. Disposal: Remove and transport debris in a manner that will prevent spillage.
- C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

### 3.5 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  1. Proceed with selective demolition systematically.
  2. Cut or drill from exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  3. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on locks, dams, retaining walls, or walks.
  5. Dispose of demolished items and materials promptly.
  6. Return elements of construction and surfaces that are to remain to condition existing

before selective demolition operations began.

- B. Removed and Salvaged Items: Comply with the following:
  - 1. Clean salvaged items.
  - 2. Pack or crate items after cleaning. Identify contents of containers.
  - 3. Store items in a secure area until delivery to Owner.
  - 4. Transport items to Owner's storage area designated by Owner.
  - 5. Protect items from damage during transport and storage.
  
- C. Removed and Reinstalled Items: Comply with the following:
  - 1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
  - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
  - 3. Protect items from damage during transport and storage.
  - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
  
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition.
  
- E. Concrete: Demolish in small sections. Cut concrete full depth at junctures with construction to remain, using power-driven saw. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete indicated for selective demolition. Neatly trim openings to dimensions indicated.
  
- F. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

### 3.6 PATCHING AND REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.
  
- B. Patching: Comply with Division 01 - -Basic Requirements: Cutting and Patching.
  
- C. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
  - 1. Completely fill holes and depressions in existing masonry walls that are to remain with an approved masonry patching material applied according to manufacturer's written recommendations.
  
- D. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.8 SELECTIVE DEMOLITION SCHEDULE

- A. Existing Items to Be Removed:
  - 1. Railing noted on drawing.
  - 2. Concrete dam walk.
- B. Existing Items to Be Removed and Reinstalled:
  - 1. Lock gate mechanical controls.
  - 2. Lock gate base bronze shoe.

**END OF SECTION**

## SECTION 03 01 00

### CONCRETE RESTORATION

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Concrete reinforcement repair.
  - 2. Concrete surface repair.
  - 3. Concrete crack repair.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  - 2. Section 03 33 00 - Structural Concrete.

##### 1.2 REFERENCES

- A. ASTM International:
  - 1. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
  - 2. ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
  - 3. ASTM C33 - Standard Specification for Concrete Aggregates.
  - 4. ASTM C109 - Standard Test Method for Compressive strength of Hydraulic Cement Mortars (Using 2-in. Cube Specimens).
  - 5. ASTM C150 - Standard Specification for Portland Cement.
  - 6. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
  - 7. ASTM C293 - Standard Test Method for Flexural Strength of Concrete (Using Simple Beam With Center-Point Loading).
  - 8. ASTM C404 - Standard Specification for Aggregates for Masonry Grout.
  - 9. ASTM C882 - Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete By Slant Shear.
  - 10. ASTM C1042 - Standard Test Method for Bond Strength of Latex Systems Used With Concrete By Slant Shear.
  - 11. ASTM D638 - Standard Test Method for Tensile Properties of Plastics.
  - 12. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics.
  - 13. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
  
- B. American Welding Society:
  - 1. AWS D1.4 - Structural Welding Code - Reinforcing Steel.



### 1.3 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal Procedures.
- B. Product Data: Submit product standards, physical and chemical characteristics, technical specifications, limitations, maintenance instructions, and general recommendations regarding each material.
- C. Manufacturer’s Instructions: Submit mixing instructions.
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

### 1.4 CLOSEOUT SUBMITTALS

- A. Division 01 – Basic Requirements: Contract Closeout Procedures.
- B. Project Record Documents: Accurately record actual locations of structural reinforcement repairs, and type of repair.
- C. Operation and Maintenance Data: Procedures for submittals.

### 1.5 QUALITY ASSURANCE

- A. Perform welding work in accordance with AWS D1.4.

### 1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- B. Applicator: Company specializing in concrete repair with minimum five years documented experience.

### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Division 01 – Basic Requirements: Transportation, Handling, Storage and Protection.
- B. Comply with instructions for storage, shelf life limitations, and handling.

## **PART 2 PRODUCTS**

### 2.1 CEMENTITIOUS MORTAR MATERIALS

- A. Manufacturers:
  - 1. The Euclid Chemical Company.
  - 2. L & M Construction Chemicals, Inc.
  - 3. Sika Corporation.
  - 4. Substitutions: In accordance with Division 01 – Basic Requirements: Substitutions.
- B. Cementitious Mortar: Packaged latex modified portland cement patching mortar with the following properties:

1. Compressive Strength: ASTM C109; minimum 2,000 psi after one day and 9,000 psi after 28 days.
  - C. Portland Cement: ASTM C150, Type 1, gray color.
  - D. Sand: ASTM C33; uniformly graded, clean.
  - E. Water: Clean and potable.
  - F. Air Entrainment Admixture: ASTM C260.
  - G. Calcium Chloride: Not permitted.
  - H. Bonding Agent: Polyvinyl acetate emulsion, dispersed in water while mixing, non-coagulant in mix, water resistant when cured.
- 2.2 REINFORCEMENT MATERIALS
- A. Reinforcing Steel: ASTM A615 60 ksi yield grade billet-steel deformed bars, unfinished finish.
- 2.3 MIXING CEMENTITIOUS MORTAR
- A. Mix cementitious mortar to consistency required for purpose intended.
  - B. Include bonding agent as additive to mix.

### **PART 3 EXECUTION**

#### 3.1 EXAMINATION

- A. Division 01 – Basic Requirements: Coordination.
- B. Verify surfaces are ready to receive work.
- C. Beginning of installation means acceptance of substrate.

#### 3.2 PREPARATION

- A. Clean concrete surfaces of dirt, laitance, corrosion, or other contamination; wire brush using water; rinse surface and allow to dry.
- B. Flush out cracks and voids with water to remove laitance and dirt.
- C. Provide temporary entry ports spaced to accomplish movement of fluids between ports; no deeper than depth of crack to be filled or port size diameter no greater than thickness of crack. Provide temporary seal at concrete surface to prevent leakage of adhesive.
- D. For areas patched with epoxy mortar, remove broken and soft concrete 6 inch deep. Remove corrosion from steel. Clean surfaces mechanically; rinse with water.

- E. Sandblast clean exposed reinforcement steel surfaces. Mechanically cut away damaged portions of bar.

3.3 REPAIR WORK

- A. Repair spalling. Fill voids flush with surface.

3.4 APPLICATION - CEMENTITIOUS MORTAR

- A. Apply coating of bonding agent to damp concrete surfaces. Provide full surface coverage.
- B. Apply cementitious mortar by steel trowel or form in to minimum thickness of 6 inches. Tamp into place filling voids at spalled areas. Work mix into honeycomb.
- C. Cure cementitious mortar for four (4) days.
- D. Heat patches as required by manufacturer.

3.5 FIELD QUALITY CONTROL

- A. Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation.

**END OF SECTION**

**SECTION 03 31 00**  
**STRUCTURAL CONCRETE**

**PART 1 GENERAL**

1.1 SUMMARY

- A. Section Includes:
  - 1. Structural Concrete.
  - 2. Admixtures.
  - 3. Curing and Treatment Requirements.
  - 4. Formwork, shoring, bracing, and anchorage.
  - 5. Concrete reinforcement and accessories.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  - 2. Section 31 23 17 – Site Excavation, Backfill and Compaction.

1.2 REFERENCES

- A. Incorporated Guides and References
  - 1. American Concrete Institute (ACI):
    - a. ACI 302.1R – Guide for Concrete Floor and Slab Construction.
    - b. ACI 304R – Guide for Measuring, Mixing, Transporting and Placing Concrete.
    - c. ACI 305R - Hot Weather Concreting.
    - d. ACI 309R – Guide for the Consolidation of Concrete.
    - e. ACI 347 – Guide to Formwork for Concrete.
    - f. ACI SP-66 – ACI Detailing Manual.
  
- B. Specifications
  - 1. American Concrete Institute (ACI):
    - a. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials.
    - b. ACI 301 - Specifications for Structural Concrete.
    - c. ACI 306.1 – Specification for Cold Weather Concreting.
    - d. ACI 308.1 – Specification for Curing Concrete.
    - e. ACI 315 - Details and Detailing of Concrete Reinforcement.
    - f. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.
  - 2. ASTM International (ASTM):
    - a. ASTM A185 – Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
    - b. ASTM A615 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

- c. ASTM C33 – Standard Specification for Concrete Aggregates.
- d. ASTM C94 – Standard Specification for Ready-Mixed Concrete.
- e. ASTM C150 – Standard Specification for Portland Cement.
- f. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete.
- g. ASTM C309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- h. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete.
- i. ASTM C618 – Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for use in Concrete.
- j. ASTM C1602 – Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.

### 1.3 SUBMITTALS

- A. Submit proposed mix design of each class of concrete to Engineer not later than 10 days after Notice to Proceed or 15 days prior to the first concrete placement.
- B. Submit shop drawings of reinforcing steel under provisions of Division 01 – Basic Requirements: Submittal Procedures.
  - 1. Initial submittal of reinforcement shop drawings shall be complete. No partial submittals will be accepted.
  - 2. Indicate reinforcement sizes, spacings, locations and quantities of reinforcing steel, and wire reinforcement, bending and cutting schedules, splicing, supporting and spacing devices.
- C. Material Certificates: For each of the following, signed by the manufacturers:
  - 1. Cementitious materials.
  - 2. Admixtures.
  - 3. Curing compounds.

### 1.4 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301, 305R, and 306.1.
- B. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

### 1.5 REGULATORY REQUIREMENTS

- A. Conform to requirements of local, state and federal rules and regulations applicable to Work and Project location.

## 1.6 ENVIRONMENTAL REQUIREMENTS

- A. Cold Weather Concreting
  - 1. Placement and curing of concrete where (1) average daily temperature for three consecutive days is less than 40 degrees F, and (2) air temperature is not greater than 50 degrees F for more than one-half of a 24-hour period from midnight to midnight shall be in accordance with ACI 306.1.
- B. Hot Weather Concreting
  - 1. Placement and curing of concrete subject to a combination of (1) rising air temperature (generally greater than 75 degrees F) and (2) wind and low relative humidity shall be in accordance with ACI 305R.
  - 2. Contractor shall provide plan for minimizing exposure of concrete to adverse conditions due to combinations of high air temperature, direct sunlight, drying winds, and high concrete temperature.
  - 3. Protect concrete from rapid temperature drop.
  - 4. Pre-wet subgrade and forms.

## PART 2 PRODUCTS

### 2.1 FORM MATERIALS

- A. Plywood Forms: Douglas Fir or Spruce-Pine-Fir species: Sound, undamaged sheets with clean true edges, exterior glue, facing material to provide finish specified.
- B. Lumber: Douglas Fir or Spruce species; construction grade or better; with grade stamp clearly visible.
- C. Preformed Steel Wall Forms: Minimum 16 gage thick, Vertically and horizontally matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and surface appearance.
- D. Form Ties For Exposed Surfaces: Plastic cone snap ties with 1-inch outside diameter by 1-inch (nominal) long cones, with no metal within 1-inch of concrete face after removal.
- E. Form Ties For Hidden Surfaces: Metal spreader type, removable to a depth of 1-inch from concrete face.
  - 1. Contractor shall use formwork, form components and accessories provided by a single manufacturer. Intermixing of formwork, components and accessories shall not be allowed.

### 2.2 REINFORCING STEEL

- A. Reinforcing Steel: ASTM A615, 60 ksi yield grade carbon steel deformed bars; uncoated finish.
- B. Welded Steel Wire Reinforcement: Plain type, ASTM A185; in flat sheets; uncoated finish.

- C. Reinforcement Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire fabric, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete.

## 2.3 CONCRETE MATERIALS

- A. Cementitious Materials
  - 1. Portland Cement: ASTM C150, gray color, Type I except as specified below.
  - 2. Fly Ash: ASTM C618, Class C.
- B. Fine and Coarse Aggregates: ASTM C33.
- C. Water: ASTM C1602, clean and not detrimental to concrete.

## 2.4 ADMIXTURES

- A. Admixtures to be used in the concrete mixture shall be submitted to the Engineer for approval as part of the mixture design.
- B. Chemical admixtures shall be in accordance with ASTM C494.
- C. Admixtures shall be used in accordance with manufacturer's written recommendations.
- D. Admixtures containing chlorides, sulfides, or nitrides are not permitted.
- E. Admixtures permitted shall be supplied by a single manufacturer for project.
- F. Air Entrainment Admixture: ASTM C260.

## 2.5 ACCESSORIES

- A. Non-Shrink Grout: Premixed compound with non-metallic aggregate, cement, water reducing and plasticizing agents; capable of minimum compressive strength of 2400 psi.
- B. Form Release Agent: Colorless material which will not stain concrete, absorb moisture or impair natural bonding or color characteristics of coating, intended for use on concrete.

## 2.6 CURING AND TREATMENT MATERIALS

- A. Water: Potable and clean.
- B. Curing Compound (Exterior Use Only): ASTM C309; Type II white pigmented;
  - 1. Manufacturers:
    - a. ChemMasters - SafeCure 3000.
    - b. Dayton Superior - Day-Chem City White Cure (J-8).
    - c. W. R. Meadows - 1200 White Series.
    - d. Substitutions: As approved by Engineer.

2. Hardeners and sealer used shall be of same manufacturer.

## 2.7 CONCRETE MIXTURE

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture of field test data, or both, according to ACI 301.
- B. Mix concrete in accordance with ASTM C94.
- C. Concrete mix designs shall be designed and submitted in accordance with Division 01 and included as part of cost of this Work.
- D. Mix designs shall be prepared by a qualified agency acceptable to Engineer. Three (3) copies of mix designs shall be submitted for Engineer's review prior to placing any concrete.
- E. Mix design shall indicate brands, types, and quantities of admixtures included, compressive strength, slump, sieve analysis for fine and coarse aggregate, quantities of all ingredients, type and brand of cement, source of aggregate, whether fine aggregate is natural or manufactured.
- F. Design of mix shall assure placing and finishing characteristics that meet Project requirements.
- G. Mix designs contained in the Schedule of Mixes may be modified and submitted to Engineer for approval, by use of mid or high range water reducing admixtures to control slumps required for pumping of concrete. Strength, placing and finishing requirements shall be maintained.
- H. Initial and final set times of concrete mix designs shall be coordinated between the contractor and concrete supplier.

## 2.8 SCHEDULE OF MIXES

- A. Footings: Proportion normal-weight concrete mix as follows:
  1. Compressive Strength (28 Days): 3000 psi.
  2. Maximum Aggregate Size: 1-1/2 inches.
  3. Air Entrainment: 6 percent air content is required with an acceptable air content of plus or minus 1.5 percent.
  4. Maximum Water-Cement Ratio: 0.50.
- B. Foundation Walls, Grade Beams: Proportion normal-weight concrete mix as follows:
  1. Compressive Strength (28 Days): 3000 psi.
  2. Maximum Aggregate Size: 3/4 - inch.
  3. Air Entrainment: 6 percent air content is required with an acceptable air content of plus or minus 1.5 percent.
- C. Slab-on-Ground, Equipment Pads: Proportion normal-weight concrete mix as follows:
  1. Compressive Strength (28 Days): 3500 psi.



2. Maximum Aggregate Size: 3/4 - inch.
3. Air Entrainment: 6 percent air content is required with an acceptable air content of plus or minus 1.5 percent.
4. Maximum Water-Cement Ratio: 0.5

### **PART 3 EXECUTION**

#### **3.1 FORMWORK**

- A. 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 concrete structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits stated below.
- C. Verify lines, levels, and measurement before proceeding with formwork.
- D. Earth forms are not permitted.
- E. Align form joints.
- F. Coordinate work of other Sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.
- G. Provide chamfer strips for all exposed concrete corners of formwork.

#### **3.2 REINFORCEMENT**

- A. Place, support, and secure reinforcement against displacement.
- B. Locate reinforcing splices as shown on Drawings.

#### **3.3 PLACING CONCRETE**

- A. Notify Engineer a minimum of 48 hours prior to commencement of concreting operations.
- B. Failure to notify Engineer may result in rejection of concrete placed without observation.
- C. Place concrete in accordance with ACI 301.
- D. Place pumped concrete in accordance with ACI 304.2R. Line coating mix to initiate pumping shall not be used in pour but shall be wasted.
- E. Ensure reinforcement and embedded items are not disturbed during concrete placement.
- F. Concrete with excessive honeycomb or embedded debris shall be rejected and replaced at no cost to OWNER.

- G. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures and mechanical injury.
- H. Placing During Hot Weather:
  - 1. Place concrete during hot weather conditions in accordance with ACI 305R.
- I. Placing During Cold Weather:
  - 1. Place concrete during cold weather conditions in accordance with ACI 306.1.
- J. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

### 3.4 FLOOR SLABS

- A. Floor slabs shall have a troweled finish.

### 3.5 REPAIR OF VERTICAL SURFACE DEFECTS

- A. Upon stripping of forms, vertical surfaces shall be inspected for defects caused by surface air voids, honeycombing, form tie holes, peeling, and fins.
- B. Surface air voids shall be repaired with a unit packaged mixture of sand and cement mixed on job site with water and a unit of acrylic. Mixture shall be brushed uniformly on to surface and into voids. Where surface is to be exposed, surface finish of repair shall match adjacent surface.
- C. Honeycombed and other defective concrete shall be removed down to sound concrete and patched to match adjacent surfaces.

### 3.6 FINISHING OF FORMED SURFACES

- A. After removal of forms and repair of defects, surfaces of concrete shall be given finishes specified below.
- B. Rough Form Finish: Surface left with texture imparted by forms; form facing material not specified; tie holes and defects shall be patched; fins exceeding 1/4-inch shall be chipped or rubbed off.
- C. Tops of walls or buttresses, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces shall be struck smooth after concrete is placed and shall be floated to a texture reasonably consistent with that of formed surface.
- D. Final finish on formed surfaces shall continue uniformly across unformed surfaces.

### 3.7 TOLERANCES

- A. All tolerances for concrete work shall be in accordance with ACI 117.

3.8 FIELD QUALITY CONTROL

- A. Testing and analysis of concrete shall be performed under provisions of Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation.
- B. Contractor will cast test cylinders and perform slump and air entrainment tests in accordance with ACI 301.
- C. Two (2) concrete test cylinders shall be cast from each increment of 100 cubic yards of each class of concrete placed each day or from each placement of each class if less than 100 cubic yards.
- D. During hot or cold weather, as defined in Section 1.6, one additional test cylinder shall be cast from each increment of 100 cubic yards of each class of concrete placed each day or from each pour of each class if less than 100 cubic yards and be cured on site under same conditions as concrete it represents.
- E. One slump test will be taken for each set of tests cylinders cast and whenever consistency of concrete appears to vary.
- F. No water may be added to the concrete at the site unless pre-approved in writing by the Engineer for that specific mix. If pre-approved, the mix ticket must state how much water may be added.

**END OF SECTION**

**SECTION 03 31 71**  
**CONCRETE REHABILITATION**

**PART 1 GENERAL**

1.1 SUMMARY

- A. Section Includes:
  - 1. Concrete Rehabilitation.
  - 2. Admixtures.
  - 3. Curing and Treatment Requirements.
  - 4. Formwork, shoring, bracing, and anchorage.
  - 5. Concrete reinforcement and accessories.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.

1.2 REFERENCES

- A. Incorporated Guides and References
  - 1. American Concrete Institute (ACI):
    - a. ACI 304R – Guide for Measuring, Mixing, Transporting and Placing Concrete.
    - b. ACI 304.2R - Placing Concrete by Pumping Methods.
    - c. ACI 305R - Hot Weather Concreting.
    - d. ACI 309R – Guide for the Consolidation of Concrete.
    - e. ACI 347 – Guide to Formwork for Concrete.
    - f. ACI SP-66 – ACI Detailing Manual.
  
- B. Specifications
  - 1. American Concrete Institute (ACI):
    - a. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials.
    - b. ACI 301 - Specifications for Structural Concrete.
    - c. ACI 306.1 – Specification for Cold Weather Concreting.
    - d. ACI 308.1 – Specification for Curing Concrete.
    - e. ACI 315 - Details and Detailing of Concrete Reinforcement.
    - f. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.
  - 2. ASTM International (ASTM):
    - a. ASTM A82 - Specification for Steel Wire, Plain, for Concrete Reinforcement.
    - b. ASTM A615 – Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

- c. ASTM A775 – Specification for Epoxy-Coated Steel Reinforcing Bars.
- d. ASTM C33 – Specification for Concrete Aggregates.
- e. ASTM C94 – Specification for Ready-Mixed Concrete.
- f. ASTM C109 – Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens).
- g. ASTM C150 – Specification for Portland Cement.
- h. ASTM C156 – Standard Test Method for Water Retention by Concrete Curing Materials.
- i. ASTM C171 – Specification for Sheet Materials for Curing Concrete.
- j. ASTM C260 – Specification for Air-Entraining Admixtures for Concrete.
- k. ASTM C309 – Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- l. ASTM C494 – Specification for Chemical Admixtures for Concrete.
- m. ASTM C618 – Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for use in Concrete.
- n. ASTM C882 – Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete By Slant Shear.
- o. ASTM C989 – Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
- p. ASTM C1042 – 99 – Standard Test Method for Bond Strength of Latex Systems Used With Concrete By Slant Shear.
- q. ASTM C1059 – Specification for Latex Agents for Bonding Fresh to Hardened Concrete.
- r. ASTM C1602 - Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.

### 1.3 SUBMITTALS

- A. Submit repair method, repair material, and proposed mix design to Engineer not later than 10 days after Notice to Proceed or 15 days prior to the first concrete placement, whichever comes first.
- B. Submit shop drawings of reinforcing steel under provisions of Division 01 – Basic Requirements: Submittal Procedures.
  - 1. Initial submittal of reinforcement shop drawings shall be complete. No partial submittals will be accepted.
  - 2. Indicate reinforcement sizes, spacings, locations and quantities of reinforcing steel, bending and cutting schedules, splicing, supporting and spacing devices.
- C. Material Certificates: For each of the following, signed by the manufacturers:
  - 1. Bonding agent.
  - 2. Cementitious materials.
  - 3. Admixtures.
  - 4. Curing compounds.
  - 5. Bonding agents.

#### 1.4 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301, 305R, and 306.1.

#### 1.5 REGULATORY REQUIREMENTS

- A. Conform to requirements of local, state and federal rules and regulations applicable to Work and Project location.

#### 1.6 ENVIRONMENTAL REQUIREMENTS

- A. Cold Weather Concreting
  - 1. Placement and curing of concrete where (1) average daily temperature for three consecutive days is less than 40 degrees F, and (2) air temperature is not greater than 50 degrees F for more than one-half of a 24-hour period from midnight to midnight shall be in accordance with ACI 306.1.
- B. Hot Weather Concreting
  - 1. Placement and curing of concrete subject to a combination of (1) rising air temperature (generally greater than 75 degrees F) and (2) wind and low relative humidity shall be in accordance with ACI 305R.
  - 2. Contractor shall provide plan for minimizing exposure of concrete to adverse conditions due to combinations of high air temperature, direct sunlight, drying winds, and high concrete temperature.
  - 3. Protect concrete from rapid temperature drop.
  - 4. Pre-wet subgrade and forms.

### **PART 2 PRODUCTS**

#### 2.1 FORM MATERIALS

- A. Plywood Forms: Douglas Fir or Spruce-Pine-Fir species: Sound, undamaged sheets with clean true edges, exterior glue, facing material to provide finish specified.
- B. Preformed Steel Wall Forms: Minimum 16 gage thick, matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and surface appearance.

#### 2.2 REINFORCING STEEL

- A. Reinforcing Steel: ASTM A615, 60 ksi yield grade carbon steel deformed bars; epoxy coated in accordance with ASTM A775, finish.
- B. Reinforcement Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire fabric, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete.

## 2.3 CONCRETE MATERIALS

- A. Cementitious Materials
  - 1. Portland Cement: ASTM C150, gray color, Type I except as specified below.
  - 2. Fly Ash: ASTM C618, Class F.
  - 3. Ground Granulated Blast Furnace Slag: ASTM C989, Grade 100 or 120.
- B. Fine and Coarse Aggregates: ASTM C33.
- C. Water: ASTM C1602, clean and not detrimental to concrete.

## 2.4 ADMIXTURES

- A. Admixtures to be used in the concrete mixture shall be submitted to the Engineer for approval as part of the mixture design.
- B. Chemical admixtures shall be in accordance with ASTM C494.
- C. Admixtures shall be used in accordance with manufacturer's written recommendations.
- D. Admixtures containing chlorides, sulfides, or nitrides are not permitted.
- E. Admixtures permitted shall be supplied by a single manufacturer for project.
- F. Air Entrainment Admixture: ASTM C260.
  - 1. Manufacturers:
    - a. Axim Italcementi Group.
    - b. The Euclid Chemical Company.
    - c. BASF Admixtures, Inc.
    - d. Grace Construction Products.
    - e. Substitutions: As approved by Engineer.

## 2.5 ACCESSORIES

- A. Non-Shrink Grout: Premixed compound with non-metallic aggregate, cement, water reducing and plasticizing agents; capable of minimum compressive strength of 2400 psi.
- B. Form Release Agent: Colorless material which will not stain concrete, absorb moisture or impair natural bonding or color characteristics of coating, intended for use on concrete.
  - 1. Manufacturers:
    - a. Symons Corporation - Type: Magic Kote.
    - b. W. R. Meadows - Type: Duogard.
    - c. BASF Building Systems – Castoff.
    - d. Dayton Superior - Type: Clean Strip Ultra (J-3).
    - e. Substitutions: As approved by Engineer.

## 2.6 REPAIR MORTARS

- A. Design mortar mixes to produce material having a compressive strength of 4,000 psi at 28 days.
- B. Polymer or epoxy modified repair mortar shall be capable of submerged use.
- C. Repair mortars shall be capable of application to expected surface temperatures.

## 2.7 CURING AND TREATMENT MATERIALS

- A. Water: Potable and clean.
- B. Curing Compound: ASTM C309, Type I, free of oil, wax, or grease.
  - 1. Manufacturers:
    - a. W. R. Meadows – Sealtight – Type: 1100-Clear.
    - b. Dayton Superior – Type: Day-Chem Rez Cure (J-11-W).
    - c. Symons Corporation - Type: Resi-Chem Clear.
    - d. Substitutions: As approved by Engineer.
- C. Curing and Sealing Compound: ASTM C309; Type I free of oil, wax, or grease.
  - 1. Manufacturers:
    - a. W. R. Meadows – Sealtight; Type: Vocomp-20.
    - b. Dayton Superior; Type: Safe Cure & Seal (J-18).
    - c. Symons Corporation - Type: Cure & Seal 309WB.
    - d. BASF Building Systems, Inc.: Kure-N-Seal WB.
    - e. Substitutions: As approved by Engineer.
- D. Curing Compound (Exterior Use Only): ASTM C309; Type II white pigmented.
  - 1. Manufacturers:
    - a. W. R. Meadows - Type: 1200-White Series.
    - b. Dayton Superior - Type: Day Chem White Pigmented Cure (J-8).
    - c. Symons Corporation - Type: Resi-Chem White.
    - d. Substitutions: As approved by Engineer.

## 2.8 CONCRETE MIXTURE

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture of field test data, or both, according to ACI 301.
- B. Mix concrete in accordance with ASTM C94.
- C. Concrete mix designs shall be designed by Contractor and submitted in accordance with Division 01 – Basic Requirements: Submittal Procedures and included as part of cost of this Work.
- D. Mix designs shall be prepared by a qualified agency. Six (6) copies of mix designs shall be submitted for Engineer's review prior to placing any concrete.



- E. Mix design shall indicate brands, types, and quantities of admixtures included, compressive strength, slump, sieve analysis for fine and coarse aggregate, quantities of all ingredients, type and brand of cement, source of aggregate, whether fine aggregate is natural or manufactured.
- F. Design of mix shall assure placing and finishing characteristics that meet Project requirements. Concrete placed underwater shall contain an anti-washout admixture.
- G. Mix designs contained in the Schedule of Mixes (below) may be modified and submitted to Engineer for approval, by use of mid or high range water reducing admixtures to control slumps required for pumping of concrete. Strength, placing and finishing requirements shall be maintained.
- H. Initial and final set times of concrete mix designs shall be coordinated between the contractor and concrete supplier.

## 2.9 SCHEDULE OF MIXES

- A. Concrete Repairs:
  - 1. Compressive Strength (28 Days): 4000 psi.
  - 2. Maximum Aggregate Size: 3/4 - inch.
  - 3. Air Entrainment: A minimum of 6 percent air content is required with acceptable range of air content is plus or minus 1.5 percent.
- B. Concrete Piers.
  - 1. Compressive Strength (28 Days): 4000 psi.
  - 2. Maximum Aggregate Size: 1-1/2 inch.
  - 3. Air Entrainment: A minimum of 6 percent air content is required with acceptable range of air content is plus or minus 1.5 percent.

## PART 3 EXECUTION

### 3.1 PREPARATION – CONCRETE REMOVAL

- A. Remove all unsound concrete from repair areas to a minimum of 6 inches deep.
- B. Sawcut perimeter of patch to a minimum of 1 inch.
- C. Notify Engineer if reinforcing has lost more than 10 percent of their original area. Supplemental reinforcing will be required.

### 3.2 PREPARATION OF SURFACES

- A. Thoroughly sandblast exposed fractured concrete surface and exposed reinforcing bars to remove all laitance concrete cream or contaminants that will decrease bond.
- B. Thoroughly clean and wet surface prior to applying bonding agent.

- C. Use bonding agent recommended by cementitious patching concrete manufacturer or in accordance with ACI.
- D. Do not place bonding agent on frozen surfaces.

### 3.3 PREPARATION FOR NEW CONCRETE

- A. Drill holes in existing concrete, insert steel dowels and pack with non-shrink grout where new concrete is doweled to existing concrete work.
- B. Prior to placement of new concrete clean with steel brush and apply bonding agent in accordance with manufacturer's instructions.

### 3.4 FORMWORK

- A. 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 concrete structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits stated below.
- C. Verify lines, levels, and measurement before proceeding with formwork.
- D. Earth forms are not permitted.
- E. Align form joints.
- F. Coordinate work of other Sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.

### 3.5 REINFORCEMENT

- A. Place, support, and secure reinforcement against displacement.
- B. Locate reinforcing splices as shown on Drawings.

### 3.6 PLACING CONCRETE

- A. Notify Engineer a minimum of 48 hours prior to commencement of concreting operations.
- B. Failure to notify Engineer may result in rejection of concrete placed without observation.
- C. Place concrete in accordance with ACI 301.
- D. Place pumped concrete in accordance with ACI 304.2R. Line coating mix to initiate pumping shall not be used in pour but shall be wasted.
- E. Ensure reinforcement and embedded items are not disturbed during concrete placement.

- F. Concrete with excessive honeycomb or embedded debris shall be rejected and replaced at no cost to OWNER.
- G. Application of surface retarders and sawcutting of joints shall be planned in advance.
- H. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures and mechanical injury.
- I. Placing During Hot Weather:
  - 1. Place concrete during hot weather conditions in accordance with ACI 305R.
- J. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

### 3.7 CURING AND TREATMENT

- A. Curing shall begin promptly to prevent drying of concrete. Curing shall continue for 7 days after placing.
- B. Curing methods shall not be changed until after the third day, and then only with written approval of the Engineer.
- C. Do not allow concrete to cool rapidly.
- D. Provide a moist cure for a full 7 days through the use of burlap or curing paper kept continuously moist. Material shall completely cover the concrete surface and shall be weighted down to prevent shifting due to wind or other factors.

### 3.8 FINISHING OF FORMED SURFACES

- A. After removal of forms and repair of defects, surfaces of concrete shall be given finishes specified below.
- B. When finish is to match a sample furnished to Contractor, sample finish shall be reproduced on an area at least 100 square feet in size in an inconspicuous location designated by Engineer prior to application in the specified area. Application of finish shall not be made until approved by Engineer.
- C. Rough Form Finish: Surface left with texture imparted by forms; form facing material not specified; tie holes and defects shall be patched; fins exceeding 1/4-inch shall be chipped or rubbed off.
- D. Tops of walls or buttresses, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces shall be struck smooth after concrete is placed and shall be floated to a texture reasonably consistent with that of formed surface.
- E. Final finish on formed surfaces shall continue uniformly across unformed surfaces.

### 3.9 APPLICATION - CEMENTITIOUS MORTAR

- A. Apply coating of bonding agent to damp concrete surfaces. Provide full surface coverage.
- B. Apply cementitious mortar by steel trowel or form in to minimum thickness of 6 inches. Tamp into place filling voids at spalled areas. Work mix into honeycomb.
- C. Cure cementitious mortar for four (4) days.
- D. Heat patches as required by manufacturer.

### 3.10 REPAIR OF VERTICAL SURFACE DEFECTS

- A. Upon stripping of forms, vertical surfaces shall be inspected for defects caused by surface air voids, honeycombing, form tie holes, peeling, and fins.
- B. Surface air voids shall be repaired with a unit packaged mixture of sand and cement mixed on job site with water and a unit of acrylic. Mixture shall be brushed uniformly on to surface and into voids. Where surface is to be exposed, surface finish of repair shall match adjacent surface.
- C. Honeycombed and other defective concrete shall be removed down to sound concrete and patched to match adjacent surfaces.

### 3.11 FINISHING OF CONCRETE SURFACES

- A. Final finish on concrete repair surfaces shall be flush across existing formed surfaces.
- B. Surface finish on vertical formed surfaces shall be rough formed finish.
- C. Surface finish on horizontal surfaces shall be struck smooth and floated.

### 3.12 TOLERANCES

- A. All tolerances for concrete work shall be in accordance with ACI 117.

### 3.13 FIELD QUALITY CONTROL

- A. Contractor will cast test cylinders and perform slump and air entrainment tests in accordance with ACI 301.
- B. Three concrete test cylinders shall be cast from each increment of 100 cubic yards of each class of concrete placed each day or from each placement of each class if less than 100 cubic yards.
- C. During hot or cold weather, as defined in Section 1.6, one additional test cylinder shall be cast from each increment of 100 cubic yards of each class of concrete placed each day or from each pour of each class if less than 100 cubic yards and be cured on site under same conditions as concrete it represents.

- D. One slump test will be taken for each set of tests cylinders cast and whenever consistency of concrete appears to vary.
- E. No water may be added to the concrete at the site unless pre-approved in writing by the Engineer for that specific mix. If pre-approved, the mix ticket must state how much water may be added.

**END OF SECTION**

## SECTION 03 45 04

### PLANT-PRECAST ARCHITECTURAL CONCRETE BUILDING

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Architectural precast concrete for mechanical building:
    - a. Roof.
    - b. Doors and vents.
    - c. Perimeter joint seals.
    - d. Intermediate joint seals.
    - e. Grouting under panels.
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  - 2. Section 03 31 00 - Structural Concrete: Building pad frame.

##### 1.2 REFERENCES

- A. American Concrete Institute (ACI):
  - 1. ACI 301 - Specifications for Structural Concrete.
  - 2. ACI 318 - Building Code Requirements for Structural Concrete.
- B. American Society for Testing and Material (ASTM International):
  - 1. ASTM A36 - Standard Specification for Carbon Structural Steel.
  - 2. ASTM A185 - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
  - 3. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
  - 4. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  - 5. ASTM A416 - Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete.
  - 6. ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
  - 7. ASTM A666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
  - 8. ASTM A767 - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
  - 9. ASTM A775 - Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
  - 10. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
  - 11. ASTM C33 - Standard Specification for Concrete Aggregates.
  - 12. ASTM C143 - Standard Test Method for Slump of Hydraulic Cement Concrete.

13. ASTM C150 - Standard Specification for Portland Cement.
  14. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
  15. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
- C. American Welding Society (AWS):
1. AWS D1.1 - Structural Welding Code - Steel.
  2. AWS D1.4 - Structural Welding Code - Reinforcing Steel.
- D. Precast/Prestressed Concrete Institute (PCI):
1. PCI MNL-117 - Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products.
  2. PCI MNL-120 - PCI Design Handbook - Precast and Prestressed Concrete.
  3. PCI MNL-122 - Architectural Precast Concrete.
  4. PCI MNL-123 - Design and Typical Details of Connections for Precast and Prestressed Concrete.

### 1.3 DESIGN REQUIREMENTS

- A. Contractor to provide precast concrete building to be placed on poured in place foundation pad.
- B. Design units to withstand design loads as calculated in accordance with IBC-2006 code, and erection forces. Calculate structural properties of units in accordance with ACI 318.
- C. Design units to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
- D. Design component connections to accommodate building movement and thermal movement. Provide adjustment to accommodate misalignment of structure without unit distortion or damage.

### 1.4 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittals Procedures.
- B. Shop Drawings: Indicate layout, unit locations, configuration, unit identification marks, reinforcement, connection details, support items, location of lifting devices, dimensions, openings, and relationship to adjacent materials. Submit erection drawings.
- C. Shop Drawings shall also be submitted and reviewed by the Engineer prior to any work related to precast concrete commencing on site.
- D. Design Data: Submit design data reports indicating calculations for loadings and stresses of fabricated, designed framing and connections, sealed by Engineer registered in the State of Wisconsin.
- E. Samples: Submit product data illustrating surface finish, color and texture.

## 1.5 CLOSEOUT SUBMITTALS

- A. Division 01 - Basic Requirements: Contract Closeout Procedures.
- B. Operation and Maintenance Data: Procedures for Project closeout submittals. Indicate surface cleaning instructions.

## 1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with PCI MNL-120, PCI MNL-122, PCI MNL-123, and ACI 318.
- B. Welding: AWS D1.1 and AWS D1.4.

## 1.7 QUALIFICATIONS

- A. Fabricator: Company specializing in performing Work of this section with minimum five years documented experience.
- B. Precast Manufacturer and Erectors: Qualified in accordance with PCI MNL-117 Group A1 - Architectural Concrete.
- C. Design units under direct supervision of Professional Structural Engineer experienced in design of this Work and licensed in State of Wisconsin.
- D. Welder: Qualified within previous 12 months in accordance with AWS D1.1 and AWS D1.4.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Division 01 - Basic Requirements: Transportation, Handling, Storage and Protection.
- B. Handle precast units to position, consistent with their shape and design. Lift and support only from support points.
- C. Blocking and Lateral Support During Transport and Storage: Clean, non-staining, without causing harm to exposed surfaces. Provide temporary lateral support to prevent bowing and warping.
- D. Protect units to prevent staining, chipping, or spalling of concrete.
- E. Mark units with date of production in location not visible to view when in final position in structure.

## **PART 2 PRODUCTS**

### 2.1 MATERIALS

- A. Cement: ASTM C150, Type I - Normal Portland type; white color for facing mix.



- B. Concrete Materials: ASTM C33; water and sand.
- C. Reinforcing Steel: ASTM A615, deformed steel bars, ASTM A416, pre-stressing strand; plastic sheathed, unfinished, strength and size commensurate with precast unit design.
- D. Air Entrainment Admixture: ASTM C260.
- E. Admixtures: Air entrainment.
- F. Surface Finish: Brick pattern or Owner-approved alternate conforming to sample in office of Engineer.
- G. Pigment Coloring Agent: Light tan or as specified by Owner color resistant to alkalis.
- H. Grout: Non-shrink, Normal, minimum 7,000 psi, 28 day strength.

## 2.2 SUPPORT DEVICES

- A. Connecting and Support Devices: ASTM A36 weldable steel.
- B. Bolts, Nuts, and Washers: ASTM A325, high strength steel.
- C. Primer: Zinc rich type.

## 2.3 ACCESSORIES

- A. Sealant: Polyurethane.

## 2.4 MIX

- A. Concrete: Minimum 5,000 psi, 28 day strength, air entrained to 5 to 7 percent [in accordance with ACI 301].

## 2.5 FABRICATION

- A. Fabricate in conformance with PCI MNL-117.
- B. Maintain plant records and quality control program during production of precast units. Make records available upon request.
- C. Use rigid molds, constructed to maintain precast unit uniform in shape, size, and finish.
- D. Maintain consistent quality during manufacture.
- E. Fabricate connecting devices, plates, angles, items fit to steel framing members, inserts, bolts, and accessories. Fabricate to permit initial placement and final attachment.
- F. Weld steel fabrications in accordance with AWS D1.1. Weld reinforcing steel in accordance with AWS D1.4. Do not tack weld reinforcing.

- G. Embed reinforcing steel, anchors, inserts plates, angles, and other cast-in items.
- H. Install vent and door in place while fabricating precast units. Protect assembly from damage.
- I. Locate hoisting devices to permit removal after erection.
- J. Cure units to develop concrete quality, and to minimize appearance blemishes including non-uniformity, staining, or surface cracking.
- K. Minor patching in plant is acceptable, providing structural adequacy and appearance of units is not impaired.

## 2.6 FINISH - SUPPORT DEVICES

- A. Clean surfaces of rust, scale, grease, and foreign matter.
- B. Prime paint in one coat, except surfaces in direct contact with concrete or requiring field welding.

## 2.7 FABRICATION TOLERANCES

- A. Conform to PCI MNL-117.
- B. Maximum Out of Square: 1/8 inch in 10 feet, non-cumulative.
- C. Variation From Dimensions Indicated on Shop Drawings: Plus or minus 1/8 inch.
- D. Maximum Misalignment of Anchors, Inserts, Openings: 1/8 inch.
- E. Maximum Bowing of Units: Length of bow/ 360.

## **PART 3 EXECUTION**

### 3.1 EXAMINATION

- A. Division 01 - Basic Requirements: Coordination.
- B. Verify building structure, anchors, devices, and openings are ready to receive work of this Section.

### 3.2 PREPARATION

- A. Provide for erection procedures and induced loads during erection. Maintain temporary bracing in place until final support is provided.

### 3.3 ERECTION

- A. Erect units without damage to shape or finish. Replace or repair damaged panels.
- B. Erect units level and plumb within allowable tolerances.

- C. Align and maintain uniform horizontal and vertical joints as erection progresses.
- D. When units require adjustment beyond design or tolerance criteria, discontinue affected work; advise Engineer.
- E. Fasten units in place. Perform welding in accordance with AWS D1.1.
- F. Touch-up field welds and scratched or damaged galvanized surfaces.
- G. Weld reinforcing steel in accordance with AWS D1.4. Do not tack weld reinforcing.
- H. Set vertical units dry, without grout, attaining joint dimension with lead or plastic spacers. Pack grout to base of unit.
- I. Exposed Joint Dimension: 1/2 inch.
- J. Seal perimeter and intermediate joints with polyurethane type sealant.

#### 3.4 ERECTION TOLERANCES

- A. Maximum Variation from Plane of Location: 1/4 inch in 10 feet.
- B. Maximum Offset from Indicated Alignment Between Two Connecting Units: 1/8 inch.
- C. Joint Tolerance: Plus or minus 1/8 inch.

#### 3.5 ADJUSTING

- A. Division 01 - Basic Requirements: Adjusting.
- B. Adjust units so joint dimensions are within tolerances.

#### 3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Division 01 - Basic Requirements: Protection of Installed Work.
- B. Use non-combustible shields during welding operations to protect adjacent Work.

**END OF SECTION**

## SECTION 05 12 00

### STRUCTURAL STEEL FRAMING

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
1. Fabrication, transportation, delivery, and erection of structural steel.
  2. Structural steel, framing members, support members, struts, bracing, purlins, welds, and fasteners.
  3. Base plates, anchor rods, bearing plates, weld plates, and anchors.
  4. Inserts for steel work.
  5. Non-shrink grout under base plates.
  6. Cutting, fitting, removal, and revision to existing structural framing and connections in order to fit new work to existing.
- B. Related Sections:
1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  2. Section 05 50 00 - Metal Fabrications: Steel fabrications affecting structural steel work.
  3. Section 09 96 00 - High Performance Coatings: Finish painting.

##### 1.2 REFERENCES

- A. ASTM International (American Society for Testing and Materials)
1. ASTM A36 - Structural Steel.
  2. ASTM A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  3. ASTM A108 - Steel Bars, Carbon, Cold-Finished, Standard Quality.
  4. ASTM A123 - Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products.
  5. ASTM A153 - Zinc Coating (Hot Dip) on Iron and Steel Hardware.
  6. ASTM A307 - Carbon Steel Bolts and Studs, 60000 PSI Tensile Strength.
  7. ASTM A325 - Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  8. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
  9. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
  10. ASTM A992 - Steel for Structural Shapes For Use in Building Framing.
  11. ASTM F1554 - Anchor Rods, Steel, 36, 55, and 105 ksi Yield Strength.
- B. American Welding Society (AWS).
1. AWS A2.0 - Standard Welding Symbols.
  2. AWS D1.1 - Structural Welding Code.

- C. American Institute of Steel Construction, Inc (AISC).
  - 1. AISC – Steel Construction Manual, Current Edition.
  - 2. AISC - Code of Standard Practice for Steel Buildings and Bridges.
  - 3. AISC - Specification for Architectural Exposed Structural Steel.
- D. Research Council on Structural Connections (RCSC)
  - 1. RCSC - Specification for Structural Joints Using ASTM A325 or A490 Bolts.
- E. The Society for Protective Coatings (SSPC)
  - 1. Volume 1 – Good Painting Practices, Current Edition.
  - 2. Volume 2 – Systems and Specifications.

### 1.3 SUBMITTALS

- A. Division 01- Basic Requirements: Submittal Procedures.
- B. Shop and Erection Drawings:
  - 1. Indicate profiles, sizes, spacing, and locations of structural members, openings, attachments, and fasteners.
- C. Show all connections.
  - 1. Indicate welded connections with AWS A2.0 welding symbols. Indicate net weld lengths.
  - 2. Indicate cleaning and painting specifications.
  - 3. Assume responsibility for dimensional errors.
  - 4. Field verify dimensions affected by existing construction prior to submitting Shop Drawings and so note verified dimensions on shop drawings.
  - 5. Field verify existing anchor bolt placements and modify base plates to accommodate field conditions.
  - 6. Fabricator shall check shop drawings before Submittal.
- D. Welders Certificates: Submit under provisions of Division 01 – Basic Requirements: Manufacturers’ Certificates, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

### 1.4 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC -Specifications and the AISC Code of Standard Practice for Steel Buildings and Bridges.
- B. Perform Work identified on Drawing as architecturally exposed in accordance with AISC Specification for Architectural Exposed Structural Steel.

### 1.5 QUALIFICATIONS

- A. Fabricator: Company specializing in performing the work of this Section with minimum five years documented experience.

- B. Erector: Company specializing in performing the work of this Section with minimum five years documented experience.

#### 1.6 FIELD MEASUREMENTS

- A. Verify that field measurements are as shown on Drawings and shop drawings.

### **PART 2 PRODUCTS**

#### 2.1 MATERIALS AND EQUIPMENT

- A. Structural Steel W-Shape and WT-Shape Members: ASTM A992, Fy = 50 ksi.
- B. Structural Steel Angles, Plates, Channels and Other Rolled Members: ASTM A36, Fy = 36 ksi.
- C. Rectangular or Square (HSS) Hollow Structural Sections: ASTM A500, Grade B, Fy = 46 ksi.
- D. Round (HSS) Hollow Structural Sections: ASTM A500, Grade B, Fy = 42 ksi.
- E. Steel Pipe: ASTM A53, Grade B, Fy = 35 ksi.
- F. Bolts, Nuts, and Washers: ASTM A325 High-Strength Bolts, Type 1 – Medium Carbon, Carbon Boron or Medium Carbon Alloy Steel finish; with ASTM A563 heavy hex nuts and ASTM F436 washers, head markings on bolts, fully traceable;
- G. Threaded Anchor Bolts (Anchor Rods): ASTM F1554, Class 2A threads; Grade 55 – Weldable; headless with ASTM A563 heavy hex nuts, and ASTM F436, Type 1 washers.
- H. Non-threaded Anchor Bolts (Anchor Rods): ASTM F1554; Grade 55 – Weldable.
- I. Welding Electrodes: E70XX and shall comply with AWS D1.1; type required for materials being welded.
- J. Non-Shrink Grout: Pre-mixed compound with non-metallic aggregate, cement, water reducing and plasticizing agents; capable of minimum compressive strength of 4,000 psi.
- K. Shop Primer: Interior steel receiving no additional Coatings: Universal Metal Primer for Structural Steel.
- L. Shop Primer: Exposed Interior and Exterior Steel Receiving Additional Coatings: Primer shall be Universal Metal Primer for Structural Steel compatible with subsequent finish coats specified in Division 09 - Finishes.
- M. Drilled anchors shall be HY 150 as manufactured by Hilti or approved equal.

## 2.2 FABRICATION

- A. Fabricate items of structural steel in accordance with AISC specifications, and as shown on approved shop drawings.
- B. Field connections are to be bolted unless welded, or other types of connections are indicated.
- C. Bolted connections shall be made with ASTM A325 high strength bolts, unless otherwise noted.
- D. Connections shall support a minimum of one half of the maximum total factored uniform load capacity shown in the AISC LRFD tables for factored loads on beams for the given shape, span, and steel specified, unless otherwise noted.
- E. Connections shall be made with standard double angles unless otherwise shown.
- F. Install high strength threaded fasteners in accordance with RCSC - "Specifications for Structural Joints Using ASTM A325 or A490 bolts".
- G. Welding shall comply with AISC and AWS Codes for procedures, appearance, quality of welds, and for methods used in correcting welding work.
- H. All welds shall be made by AWS pre-qualified welders, certified for welds made.
- I. Minimum size of fillet welds shall be as specified in TABLE J2.4 of AISC Manual of Steel Construction.
- J. Provide holes required for securing other work to structural steel framing and for passage of other work through steel members, as shown on approved shop drawings.
- K. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.
- L. Verify or supplement dimensions shown on Drawings by field measurements to assure fit of new work.
- M. Jointed members shall be sealed with continuous welds unless otherwise noted.

## 2.3 FINISH

- A. Prepare interior structural component surfaces for general work in accordance with SSPC - SP1 and SP3 as a minimum.
- B. Prepare structural component surfaces of exterior steel in accordance with SSPC - SP1 and SP6 as a minimum.
- C. Coated surfaces, interior or exterior, shall be prepared in accordance with coating manufacturer's SSPC requirements if more stringent than listed above.

- D. Shop Primed Structural Steel Members: Minimum one coat for interior steel, minimum two coats for exterior steel. Prime coats shall be a minimum of 2.4 mils dry thickness unless manufacturer has more stringent requirements.
- E. Do not prime surfaces that will be fireproofed, in contact with concrete. Do not prime surfaces that will be field welded unless coated with a weldable primer.
- F. Leave structural steel members unprimed that are scheduled to be galvanized.
- G. Galvanize structural steel members to ASTM A123.
- H. Provide minimum 2.0 oz/sq ft, (3.4 mils) galvanized coating for members 3/16-inch to 1/4-inch thick, and 2.3 oz/sq ft, (3.9 mils) for members greater than or equal to 1/4-inch.

### **PART 3 EXECUTION**

#### **3.1 PREPARATION**

- A. Verify that field conditions are acceptable and are ready to receive work in accordance with Drawings and shop drawings.
- B. Verify anchors and anchor rods have been preset into connection work in accordance with Drawings and shop drawings.
- C. Beginning of installation and erection means that existing conditions have been checked and found acceptable.
- D. Cost of corrections shall be borne by this Section if variances are not identified prior to start of installation.

#### **3.2 ERECTION**

- A. Erect structural steel in accordance with AISC Specifications.
- B. Store steel on site on substantial shores or blocking to keep free of ground and to prevent bending, buckling, or twisting.
- C. Prevent water collection on members.
- D. Provide for erection loads, wind, and dead loads, and provide sufficient temporary bracing to maintain structure in safe, plumb, and true alignment until completion of erection and installation of permanent bracing.
- E. Do no final bolting or welding until structure has been properly aligned and plumbed.
- F. Do not field cut or alter structural members without prior approval of Professional Engineer of Record.



- G. Field weld components indicated on Drawings and shop drawings.
- H. All bolted joints may be installed as Snug Tightened joints as specified and permitted in the RCSC - Specification, unless otherwise noted.
- I. Clean and prime welds, bolt and rivet heads, abrasions of prime coat, and surfaces not previously shop primed or galvanized, except surfaces to be in contact with concrete after erection.
- J. Grout solid under base plates, bearing plates, and leveling plates in accordance with AISC - Code of Standard Practice for Steel Buildings and Bridges.
- K. Contact surfaces of field connections shall be free from dust, oil, loose scale, burrs, pits, and other defects that prevent solid seating of parts.
- L. Clean all surfaces of dirt, mud, oil, or grease that would impair bonding of fireproofing or concrete.
- M. Reaming is not allowed if reaming weakens or makes it impossible to fill holes or adjust accurately after being reamed.

### 3.3 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: 1/8 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/8 inch.

**END OF SECTION**

**SECTION 05 50 00**  
**METAL FABRICATIONS**

**PART 1 GENERAL**

1.1 SUMMARY

- A. Section includes shop fabricated metal items.
  - 1. Structural supports for miscellaneous attachments.
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  - 2. Section 35 20 17 – Hydraulic System for Miter Gates.

1.2 REFERENCES

- A. ASTM International:
  - 1. ASTM A36 - Standard Specification for Carbon Structural Steel.
  - 2. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - 3. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - 4. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - 5. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  - 6. ASTM A354 - Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners.
  - 7. ASTM A479 - Standard Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels.
  - 8. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
  - 9. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
  - 10. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
  - 11. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
  - 12. ASTM F436 - Standard Specification for Hardened Steel Washers.
  - 13. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
- B. American Welding Society:
  - 1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
  - 2. AWS D1.1 - Structural Welding Code - Steel.

3. AWS D1.6 - Structural Welding Code - Stainless Steel.
- C. The Society for Protective Coatings:
1. SSPC - Steel Structures Painting Manual.
  2. SSPC SP 1 - Solvent Cleaning.
  3. SSPC SP 10 - Near-White Blast Cleaning.
  4. SSPC Paint 15 - Steel Joist Shop Paint.
  5. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).

### 1.3 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal requirements.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.
- C. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Division 01 – Basic Requirements: Transportation, Handling, Storage and Protection.
- B. Accept metal fabrications on site in labeled shipments. Inspect for damage.
- C. Protect metal fabrications from damage by exposure to weather.

### 1.5 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on shop drawings.

## **PART 2 PRODUCTS**

### 2.1 MATERIALS - STEEL

- A. Steel Sections: ASTM A36.
- B. Steel Plate: ASTM A36.
- C. Hollow Structural Sections: ASTM A500, Grade B.
- D. Steel Pipe: ASTM A53, Grade B.
- E. Bolts: ASTM A325; Type 1.
  1. Finish: Hot dipped galvanized.

- F. Nuts: ASTM A563 heavy hex type.
  - 1. Finish: Hot dipped galvanized.
- G. Washers: ASTM F436; Type 1.
  - 1. Finish: Hot dipped galvanized.
- H. Welding Materials: AWS D1.1; type required for materials being welded.
- I. Shop Primer: SSPC Paint 15, Type 1, red oxide.
- J. Touch-Up Primer: Match shop primer.
- K. Touch-Up Primer for Galvanized Surfaces: SSPC Paint 20 Type I Inorganic or Type II Organic.

## 2.2 STRUCTURAL SUPPORTS

- A. Structural Supports for Hydraulic Controls: Steel sections, shape and size as indicated on Drawings; galvanized finish 2.0 oz./sq. ft.

## 2.3 ANCHOR BOLTS

- A. Anchor Rods: ASTM F1554; Grade 55, weldable.
  - 1. Shape: Straight.
  - 2. Furnish with nut and washer; unfinished.

## 2.4 FABRICATION

- A. Fabricate items with joints tightly fitted and secured.
- B. Continuously seal joined members by continuous welds.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

## 2.5 FACTORY APPLIED FINISHES - STEEL

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Do not prime surfaces in direct contact with concrete or where field welding is required.

- C. Prime paint items with two coats except where galvanizing is specified.
- D. Galvanizing: ASTM A123; minimum 2.0 oz/sq ft coating thickness; galvanize after fabrication.
- E. Galvanizing for Fasteners, Connectors, and Anchors:
  - 1. Hot-Dipped Galvanizing: ASTM A153.
  - 2. Mechanical Galvanizing: ASTM B695; Class 50 minimum.

## 2.6 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.

## **PART 3 EXECUTION**

### 3.1 EXAMINATION

- A. Division 01 – Basic Requirements: Coordination.
- B. Verify field conditions are acceptable and are ready to receive Work.

### 3.2 PREPARATION

- A. Verify supports are acceptable to hydraulic controls supplier.

### 3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Make provisions for erection stresses. Install temporary bracing to maintain alignment, until permanent bracing and attachments are installed.
- C. Perform field welding in accordance with AWS D1.1.
- D. Obtain approval of Architect/Engineer prior to site cutting or making adjustments not scheduled.
- E. After erection, touch up welds, abrasions, and damaged finishes with prime paint or galvanizing repair paint to match shop finishes.

### 3.4 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: 1/8 inch.
- B. Maximum Offset From Alignment: 1/8 inch.

C. Maximum Out-of-Position: 1/8 inch.

3.5 FIELD QUALITY CONTROL

A. Welding: Inspect welds in accordance with AWS D1.1.

**END OF SECTION**

**SECTION 05 50 13**  
**METAL FISHING PLATFORMS**

**PART 1 GENERAL**

1.1 SUMMARY

- A. Section Includes:
  - 1. Steel platforms and landings.
  - 2. Integral railing and handrailing.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01- Basic Requirements shall govern all work under this Section.
  - 2. Section 03 31 00 - Structural Concrete: Foundations for service platforms.
  - 3. Section 05 12 00 - Structural Steel Framing: Framing supporting service platforms.
  - 4. Section 05 50 00 - Metal Fabrications: Miscellaneous supports.

1.2 REFERENCES

- A. American Institute of Timber Construction:
  - 1. AITC 109 - Standard for Preservative Treatment of Structural Glued Laminated Timber.
  
- B. American Institute of Steel Construction:
  - 1. AISC Code of Standard Practice for Steel Buildings and Bridges.
  - 2. AISC Load and Resistance Factor Design (LRFD) Specification for Structural Steel Buildings.
  - 3. AISC Specification for the Design of Steel Hollow Structural Sections.
  - 4. AISC Specification for Structural Steel Buildings Allowable Stress Design, and Plastic Design.
  
- C. American Society of Civil Engineers:
  - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
  
- D. American Welding Society:
  - 1. AWS D1.1 - Structural Welding Code - Steel.
  
- E. American Wood Preservers Association (AWPA):
  - 1. AWPA U1 – Use Category System: User Specification for Treated Wood.
  - 2. AWPA C20 - Structural Lumber Fire Retardant Treatment by Pressure Process.
  
- F. ASTM International:
  - 1. ASTM A36 - Standard Specification for Carbon Structural Steel.
  - 2. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

3. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
4. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
5. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes.
6. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
7. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
8. ASTM A354 - Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners.
9. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
10. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
11. ASTM A992 - Standard Specification for Structural Steel Shapes.
12. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
13. ASTM F436 - Standard Specification for Hardened Steel Washers.

G. Federal Specifications:

1. DOD-D-21035A – Galvanizing Repair.

H. National Association of Architectural Metal Manufacturers:

1. NAAMM AMP 521 - Pipe Railing Systems Manual.

I. National Forest Products Association (NFPA - Lumber):

1. NFPA - Lumber Grading Rules.

J. National Ornamental & Miscellaneous Metals Association:

1. NOMMA Guideline 1 - Joint Finishes.

K. Research Council on Structural Connections:

1. RCSC - Specification for Structural Joints Using ASTM A325 or A490 Bolts.

L. The Society for Protective Coatings:

1. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).
2. SSPC SP 3 - Power Tool Cleaning.

M. Southern Pine Inspection Bureau (SPIB):

1. SPIB - Lumber Grading Rules.

### 1.3 SUBMITTALS

A. Division 01 – Basic Requirements: Submittal Procedures.

B. Shop Drawings:

1. Indicate platform, railing, layout, clearances, and fit to other foundations.



2. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
  3. Show and identify field measurements.
- C. Product Data: Submit data for grating.
- D. Welders Certificates: Certify welders and welding procedures employed on the Work, verifying AWS qualification within previous 12 months.

#### 1.4 QUALITY ASSURANCE

- A. Fabricate platforms, handrails, railings, and ladders in accordance with the following:
1. NAAMM AMP 510, Class Service.
  2. NAAMM AMP 521.
  3. AISC Code of Standard Practice for Steel Buildings and Bridges.
  4. AISC Specification for Structural Steel Buildings Allowable Stress Design, and Plastic Design.
  5. RCSC Specification for Structural Joints Using ASTM A325 or CFAVF12 Bolts.

#### 1.5 QUALIFICATIONS

- A. Fabricator: Company specializing in manufacturing products specified in this section with minimum five years experience.
- B. Erector: Company specializing in performing work of this section with minimum five years experience.
- C. Welders and Welding Procedures: AWS D.1 qualified within previous 12 months for employed weld types.

#### 1.6 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

#### 1.7 COORDINATION

- A. Division 01 – Basic Requirements: Coordination.
- B. Coordinate work with the following:
1. Section 03 31 00 – Structural Concrete for foundations supporting platforms.

### **PART 2 PRODUCTS**

#### 2.1 STEEL MATERIALS

- A. Structural W-Shapes: ASTM A992.
- B. Structural T-Shapes: Cut from structural W-shapes.

- C. Channels and Angles: ASTM A36.
- D. Round Hollow Structural Sections: ASTM A500, Grade B.
- E. Square and Rectangular Hollow Structural Sections: ASTM A500, Grade B.
- F. Structural Pipe: ASTM A53, Grade B.
- G. Structural Plates: ASTM A36.

## 2.2 WOOD DECKING

- A. Decking: 5/4 Pressure-Treated Southern Pine Wood.

## 2.3 FASTENERS, CONNECTORS, AND ANCHORS

- A. High Strength Bolts: ASTM A325; Type 1.
  - 1. Finish: Hot dipped galvanized.
- B. Nuts: ASTM A563 heavy hex type.
  - 1. Finish: Hot dipped galvanized.
- C. Washers: ASTM F436; Type 1, circular.
  - 1. Finish: Hot dipped galvanized.

## 2.4 WELDING MATERIALS

- A. Steel Welding Materials: AWS D1.1; type required for materials being welded.

## 2.5 ACCESSORIES

- A. Touch-Up Primer for Galvanized Surfaces: DOD-D-21035A – Galvanizing Repair.

## 2.6 FABRICATION - GENERAL

- A. Fit and shop assemble in largest practical sections, for delivery to site and field bolted assembly.
- B. Fabricate components with joints tightly fitted and secured.
- C. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- E. Accurately form components required for anchorage of platforms, landings, railings, and handrails to each other and to foundations.

- F. Weld Finishing: NOMMA Guideline 1.
  - 1. Railings, Handrails, and Ladders: Joint Finish 3, partially dressed weld with spatter removed.
  - 2. Other Components: Joint Finish 4, good quality undressed weld with minimal spatter.

## 2.7 PLATFORM AND LANDING FABRICATION

- A. Framing: Structural steel shapes as indicated on Drawings.
- B. Traffic Surface: Metal bar grating bolted to framing.
- C. Openings: Cut opening for penetrations through grating, band exposed edges, and toe plates at opening perimeter.

## 2.8 RAILING AND HANDRAILS FABRICATION

- A. Posts and Rails: 1-1/2 inch diameter pipe, welded joints.
- B. Guard Top Rail: 42 inches above traffic surface to top of rail or as indicated on Drawings.
- C. Intermediate Rails: Spaced for maximum 21 inch clear opening between rail and toe plate.
- D. Attachment: Bolted to stringers and platform perimeter framing.

## 2.9 SHOP FINISHING

- A. Galvanizing for Steel Members: ASTM A123; minimum 1.2 oz/sq ft coating thickness; galvanize after fabrication.
- B. Galvanizing for Fasteners, Connectors, and Anchors:
  - 1. Hot-Dipped Galvanizing: ASTM A153.
  - 2. Mechanical Galvanizing: ASTM B695; Class 50 minimum.

## 2.10 SOURCE QUALITY CONTROL

- A. Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation.
- B. Bolted Connections: Inspect in accordance with AISC specifications.
  - 1. Visually inspect all bolted structural steel connections.
- C. Welding:
  - 1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
  - 2. Visually inspect all structural steel welds.
- D. Correct defective bolted connections and welds.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify foundations and bearing surfaces are at correct elevation.
- B. Verify anchors rods are set in correct locations and arrangements with correct exposure for platform structure attachment.
- C. Verify structural frame supporting platform is installed and braced for additional loads.
- D. Verify equipment installation is sufficiently complete to permit installation of service platform without interfering with equipment installation.

### **3.2 PREPARATION**

- A. Furnish templates for installation of anchor rods embedded in concrete and masonry foundations.

### **3.3 INSTALLATION**

- A. Install components plumb and level, accurately fitted, free from distortion or defects.
- B. Allow for erection loads, and for sufficient temporary bracing to maintain platform safe, plumb, and in alignment until completion of erection and installation of permanent bracing.
- C. Make field connections with threaded fasteners.
- D. Fasten metal bar grating to platform framing using clips recessed below traffic surface.
- E. Do not field cut or alter structural members without approval of Engineer.
- F. After erection, touch up abrasions to match shop finishes.
- G. Field finish components as specified in Section 09 90 00.

### **3.4 FIELD QUALITY CONTROL**

- A. Division 01 – Basic Requirements: Quality Assurance / Quality control of Installation.
- B. Bolted Connections: Inspect in accordance with AISC specifications.
  - 1. Visually inspect all bolted structural steel connections.
- C. Correct defective bolted connections.

**END OF SECTION**

## SECTION 09 96 00

### HIGH-PERFORMANCE COATINGS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section includes high performance coatings and special preparation of surfaces.
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.

##### 1.2 REFERENCES

- A. Military Standardization Documents:
  - 1. MIL C-22750 - Coatings: Epoxy Polyamide.
  - 2. MIL-PRF-4556F.
- B. SSPC: The Society for Protective Coatings:
  - 1. SSPC - Steel Structures Painting Manual.
  - 2. SSPC SP 3 - Power Tool Cleaning.
  - 3. SSPC SP 6 - Commercial Blast Cleaning.

##### 1.3 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal Procedures.
- B. Product Data: Submit data indicating coating materials and performance ratings.
- C. Submit two samples illustrating colors available for selection.
- D. Manufacturer's Installation Instructions: Submit special procedures and perimeter conditions requiring special attention.

##### 1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Applicator: Company specializing in performing Work of this section with minimum three years documented experience.

##### 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation.

- B. Install coating in accordance with manufacturer's temperature and humidity requirements.
- C. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of coating.
- D. Restrict traffic from area where coating is being applied or is curing.

## **PART 2 PRODUCTS**

### **2.1 HIGH PERFORMANCE COATINGS**

- A. Manufacturers:
  - 1. Carboline Company.
  - 2. PPG High Performance Coatings.
  - 3. Sherwin-Williams.
  - 4. Tnemec Co., Inc.
  - 5. Substitutions: In accordance with Division 01 – Basic Requirements: Substitutions.

### **2.2 COMPONENTS**

- A. Coatings - General: Furnish complete multi-coat systems formulated and recommended by manufacturer for applications indicated, in thicknesses indicated; number of coats specified does not include primer or filler coat.
  - 1. Maximum VOC content: As required by applicable regulations.
- B. Epoxy Coating: Two coats, 2-part polyamide epoxy, MIL C-22750, semi-gloss finish.
  - 1. Dry film thickness, per coat: 3-5 mils, minimum.
  - 2. Comply with performance requirements specified above for moderate exposure.
  - 3. Comply with performance requirements of MIL C-22750.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Division 01 – Basic Requirements: Coordination.
- B. Verify substrate surfaces are ready to receive work as instructed by coating manufacturer. Obtain and follow manufacturer's instructions for examination and testing of substrates.

### **3.2 PREPARATION**

- A. Clean surfaces of loose foreign matter.
- B. Remove finish hardware, fixture covers, and bushings.
- C. Ferrous Metal:
  - 1. Remove loose rust, loose mill scale, and other foreign substances using power tools according to SSPC-SP 3 for embedded steel items and by blasting according to

SSPC-SP 6 or -SP 7 for shop painted items.

- D. Protect adjacent surfaces and materials not receiving coating from overspray; mask when necessary to provide adequate protection. Repair damage.

### 3.3 INSTALLATION

- A. Apply primer to all surfaces, unless specifically not required by coating manufacturer.
- B. Apply coatings to thicknesses specified.
- C. Apply in uniform thickness coats, without runs, drips, pinholes, brush marks, or variations in color, texture, or finish. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

**END OF SECTION**

## SECTION 26 00 00

### BASIC ELECTRICAL REQUIREMENTS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
1. General Electrical Requirements.
  2. Work Included in Contract.
  3. Definitions.
  4. Dimensions and Equipment Location.
  5. Owner Supplied Products.
  6. Work by Owner.
  7. Pre-Installation Meetings.
  8. Demonstration and Training Meetings.
  9. Product Data.
  10. Shop Drawings.
  11. Test Reports.
  12. Manufacturer's Certificates.
  13. Manufacturer's Instructions.
  14. Manufacturer's Field Reports.
  15. Quality Assurance and Control of Installation.
  16. Temporary Facilities and Controls.
  17. Delivery, Storage, and Handling Requirements.
  18. Product Options.
  19. Product Substitution Procedures.
  20. Final Cleaning and Painting.
  21. Starting of Systems.
  22. Demonstration and Instructions.
  23. Project Record Documents.
  24. Extra Material and Spare Parts.
  25. Operation and Maintenance Manuals.
  26. Warranties.
  27. Identification.
  28. Pre-bid Survey.

##### 1.2 GENERAL ELECTRICAL REQUIREMENTS

- A. Mention of any article, operation or method requires that Contractor shall provide same and perform each operation in complete accordance with conditions stated.
- B. Contractor shall provide all material, labor, equipment and transportation as necessary to complete project in compliance with Construction Documents.



- C. In general, this work includes everything essential for a complete electrical system in operating order as shown on drawings and indicated in specifications.
- D. Work shall be installed in accordance with National, State, and Local codes, ordinances, laws, and regulations. Comply with all applicable OSHA regulations.
- E. Materials shall have a UL or ETL label where a UL or ETL standard or testing requirement exists.
- F. All work shall be installed in accordance with all State and Local Inspection Authorities having jurisdiction together with recommendations of manufacturer whose equipment is to be supplied and installed under this Contract.
- G. Before submitting a bid, each bidder shall examine all specifications and drawings relating to their work and shall become fully informed as to extent and character of work required and its relation to other work within project area.
- H. Contractor, in conjunction with Engineer's representative, shall establish exact locations of all materials and equipment to be installed.
- I. Consideration shall be given to construction features, equipment of other trades and requirements of equipment proper.
- J. All materials shall be suitably stored and protected prior to installation and all work shall be protected after installation, during construction and prior to acceptance.
- K. Contractor shall furnish all scaffolding, rigging, hoisting and services necessary for delivery, erection and installation of all equipment and apparatus required to be installed by Contractor.
- L. All such equipment shall be removed by Contractor upon completion of project.
- M. Refer to Division 01 – Basic Requirements for temporary electrical service.

### 1.3 WORK INCLUDED IN CONTRACT

- A. Contractor shall provide auxiliary contacts, buttons, and switches on starters as required.
- B. Contractor shall provide power wiring (120 V or greater) to control panels, motor starters, variable frequency drives, motors, electric actuators, electric devices and smoke detectors.

### 1.4 DEFINITIONS

- A. Exposed: Exposed to view in any room, corridor or stairway.
- B. Code: National, State and Local Electrical codes including OSHA requirements.
- C. Signal Voltage: NEC class 1, 2, or 3 remote control, signaling, or power limited circuits.

- D. Low Voltage: 50 to 600 volts.
- E. Medium Voltage: 601 to 35,000 volts.
- F. High Voltage: 35,001 volts and greater.
- G. Electrical Ductbank: Assembly consisting of electrical conduits encased in concrete.

#### 1.5 DIMENSIONS AND EQUIPMENT LOCATION

- A. Drawings depicting electric work are diagrammatic and show, in their approximate location, symbols representing electrical equipment and devices.
- B. Exact locations of such equipment and devices shall be established in field in accordance with instructions from Engineer as established by manufacturer's installation drawings and details.
  - 1. Contractor shall refer to shop drawings and submittal drawings for all equipment requiring electrical connections to verify rough-in and connection locations.
  - 2. Unless specifically stated, no measurement of an electric drawing derived by scaling shall be used as a dimension to work by.
  - 3. Dimensions noted on electric drawings are subject to measurements of adjacent and previously completed work.
  - 4. All measurements shall be performed prior to actual installation of equipment.

#### 1.6 OWNER SUPPLIED PRODUCTS

- A. Owner shall provide new exterior lighting fixture.

#### 1.7 WORK BY OWNER

- A. Owner shall supply and install new light pole.

#### 1.8 PRE-INSTALLATION MEETINGS

- A. When required in individual specification sections, convene pre-installation meeting at Project site prior to commencing work of specific section.
- B. Require attendance of parties directly affecting, or affected by, Work of specific section.
- C. Notify Engineer four (4) days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
  - 1. Review conditions of installation, preparation and installation procedures.
  - 2. Review coordination with related work.
- E. Record minutes and distribute copies within two (2) days after meeting to participants, with two (2) copies to Engineer, and those affected by decisions made.

## 1.9 DEMONSTRATION AND TRAINING MEETING

- A. Contractor shall schedule and administer demonstration and training sessions for Owner for each portion of equipment and products that are required to have training in proper operation and maintenance.
- B. Contractor shall schedule representatives of the equipment manufacturer to attend demonstration and training sessions to provide additional information as necessary.

## 1.10 PRODUCT DATA

- A. Product Data: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Construction Documents.
- B. Provide copies and distribute in accordance with Submittal Procedures article in Division 01 – Basic Requirements – Submittal Procedures and for record documents purposes described in Division 01 – Basic Requirements.
- C. Submit number of copies Contractor requires, plus three (3) copies Engineer will retain.
- D. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- E. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- F. After review distribute in accordance with Submittal Procedures article in Division 01 – Basic Requirements - Submittal Procedures and provide copies for record documents described in Division 01 – Basic Requirements.

## 1.11 SHOP DRAWINGS

- A. Shop Drawings: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Construction Documents.
- B. Produce copies and distribute in accordance with Submittal Procedures article in Division 01 – Basic Requirements – Submittal Procedures and for record documents purposes described in Division 01 – Basic Requirements.
- C. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- D. Shop drawings shall be submitted in advance of construction and installation so as to not cause delay in other Contractor's work.

- E. Data submitted for Engineer's review shall be numbered consecutively, shall be noted to correlate with electrical drawings and shall bear:
  - 1. Name and location of project.
  - 2. Name of Contractor.
  - 3. Date of submittal.
  - 4. Date of drawings and date of each correction and revision.
  - 5. If more than one type of lighting fixture (or other material) is on submitted sheet, proposed equipment shall be conspicuously checked with red pen by Electrical Contractor.
- F. Shop drawings for different systems and equipment shall, be bound separately by specification section and not bound by manufacturer.
- G. Submittals which contain different specification section systems bound together shall be returned not reviewed and returned to Contractor for re-submittal.
- H. Lighting Fixture shop drawings shall consist of single submittal with all project light fixtures included. Submittals grouped by manufacturer shall not be accepted. Contractor shall be responsible for coordinating drawings from his various suppliers in order to comply with this requirement.
- I. Contractor shall examine shop drawings and equipment brochures prior to submission.
- J. Contractor shall verify that materials and equipment depicted will properly fit into construction.
- K. Contractor shall also review all previously completed work related to installation of equipment depicted to insure that it has been properly installed.
- L. No materials or equipment subject to prior review by Engineer shall be fabricated or installed by Contractor, without approval.
- M. Engineer's review of shop drawings shall not relieve Contractor of responsibility for deviations from requirements of drawings and specifications, unless prior approval for such deviations has been granted.
- N. Submit number of opaque reproductions Contractor requires, plus three (3) copies Engineer will retain.
- O. After review, Contractor shall reproduce and distribute (3) three copies to Engineer, maintain copies required for Record Documents described in Division 01 – Basic Requirements: Submittal Procedures.

#### 1.12 TEST REPORTS

- A. Operation of equipment and electrical systems does not constitute an acceptance of work by Owner.

- B. Final acceptance is to be made after Contractor has adjusted their equipment and demonstrated that it meets or exceeds requirements of drawings and specifications.
- C. After work is completed and prior to acceptance, Contractor shall conduct following tests, tabulate data, date, sign and submit to Engineer:
  - 1. Standard megger insulation test on each feeder.
  - 2. Ground resistance test.
  - 3. Clamp ammeter test on each feeder conductor with all utilization equipment energized.
    - a. Load current in each phase conductor of feeder or portion thereof supplying panel shall not differ from average connected load currents in feeder conductors by more than 7-1/2 percent.
    - b. If load current does differ by more than 7-1/2 percent, Contractor shall change phase loading to same or receive written approval from Engineer that this is not required due to nature of load.
- D. Upon completion of installation, Contractor shall furnish certificates of approval from authorities having jurisdiction.
- E. Contractor shall demonstrate that all work is complete and is in specified operating condition, with raceway and conduit system properly grounded, wiring free from grounds, shorts, and entire installation is free from any physical defects.
- F. In presence of Engineer and Owner, Contractor shall demonstrate proper operation of all systems.
- G. Perform other testing as specifically directed in other sections of specifications for specific equipment.

#### 1.13 MANUFACTURER'S CERTIFICATES

- A. When specified in individual specification sections, submit certification by manufacturer, installation/ application subcontractor, or Contractor to Engineer, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Engineer.

#### 1.14 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Engineer for delivery to Owner in quantities specified for Product Data.

- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

#### 1.15 MANUFACTURER'S FIELD REPORTS

- A. Submit reports for Engineer's benefit as contract administrator or for Owner.
- B. Submit report in duplicate within 30 days of observation to Engineer for information.
- C. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Construction Documents.

#### 1.16 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce Work of specified quality.
- B. Comply fully with manufacturer's instructions, including each step in sequence.
- C. Should manufacturer's instructions conflict with Construction Documents, request clarification from Engineer/Architect before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons qualified to produce workmanship of specified quality.
- F. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

#### 1.17 TEMPORARY FACILITIES AND CONTROLS

- A. Reference Division 01 – Basic Requirements: Contractor Use of Premises for temporary facilities and control requirements.

#### 1.18 PRODUCT DELIVERY, STORAGE AND HANDLING REQUIREMENTS

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

- D. Store and protect products in accordance with manufacturer's instructions.
- E. Store with seals and labels intact and legible.
- F. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- G. For exterior storage of fabricated products, place on sloped supports above ground.
- H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- I. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- J. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

#### 1.19 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and meeting specifications; no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit request for substitution for any manufacturer not named in accordance with following article.
- D. Materials and equipment required shall be of new manufacture.
- E. Items specified shall be of latest type or model produced by manufacturer specified. If model number is obsolete, substitute current manufacturer's product.

#### 1.20 PRODUCT SUBSTITUTION PROCEDURES

- A. Substitutions may be considered when a product becomes unavailable through no fault of Contractor.
- B. Document each request with complete data substantiating compliance of proposed Substitution with Construction Documents.
- C. A request constitutes a representation that Contractor:
  1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
  2. Will provide same warranty for Substitution as for specified product.
  3. Will coordinate installation and make changes to other Work that may be required

- for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.
  5. Will reimburse Owner and Engineer/Architect for review or redesign services associated with re-approval by authorities having jurisdiction.
- D. Substitutions will not be considered when they are indicated or implied on shop drawings or product data submittals, without separate written request, or when acceptance will require revision to Construction Documents.
- E. Substitution Submittal Procedure:
1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
  2. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.
  3. Lighting Fixtures: Request for substitutions shall include photometric test reports performed by an independent testing laboratory.
  4. Contractor shall provide samples of proposed equipment for Engineer's review, if requested by Engineer.
  5. Contractor shall furnish any other information or materials as requested by Engineer to establish equality.
  6. Engineer will notify Contractor in writing of decision to accept or reject request.
- F. Contractor's submitting equipment for approval as an equal, shall include in their bid all incidental costs that may result from use of approved equipment.
- G. Such costs shall include, but not be limited to, additional costs that may be incurred by other contractors whose scope of work is affected by use of "equal" products.
- H. Electrical Contractor shall be responsible for those costs even if they do not become evident until after bidding.
- I. Only one request for substitution will be considered for each product.
- J. When substitution is not accepted, provide specified product.
- 1.21 FINAL CLEANING AND PAINTING
- A. Rubbish resulting from work shall be removed and disposed of on a daily basis in such manner as to be acceptable to Architect.
  - B. Contractor shall clean all exposed iron work, interior and exterior of cabinets and pull boxes, etc., and remove rubbish and debris resulting from work.
  - C. Where painted surfaces of equipment have been damaged or rusted during construction, Contractor shall paint same to match final.



- D. Clean other equipment as indicated in other sections of specification for specific equipment.

#### 1.22 STARTING OF SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Engineer and Owner seven (7) days prior to start-up of each item.
- C. Verify each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable manufacturer's representative in accordance with manufacturer's instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

#### 1.23 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

#### 1.24 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of following electrical record documents; record actual revisions to the Work:
  - 1. Locations of all buried conduit or similar items. Include buried depth.
  - 2. Field changes of dimension or detail.
  - 3. Changes made by field order or change order.
  - 4. Details not on original contract drawings.
  - 5. Changes to circuit numbers.
  - 6. Junction box locations and conduit runs, with trade sizes indicated, for all lighting, power, and electrical systems installed.
  - 7. Record documents include:
    - a. Drawings.
    - b. Specifications.
    - c. Addenda.
    - d. Change Orders and other modifications to the Contract.
    - e. Reviewed Shop Drawings, Product Data, and Samples.
    - f. Manufacturer's instruction for assembly, installation, and adjusting.

- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including following:
  - 1. Manufacturer's name and product model and serial number.
  - 2. Product substitutions or alternates utilized.
  - 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
  - 1. Measured depths of foundations in relation to finish first floor datum.
  - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
  - 4. Field changes of dimension and detail.
  - 5. Details not on original Contract drawings.
- G. Submit documents to Engineer for review.

#### 1.25 EXTRA MATERIAL AND SPARE PARTS

- A. Furnish spare parts, maintenance, and extra products in quantities specified in individual specification sections.
- B. Deliver to Project site and place in location as directed by Owner; obtain receipt prior to final payment.

#### 1.26 OPERATION AND MAINTENANCE MANUALS

- A. Electrical Contractor shall assemble and submit to Architect for subsequent submission to Owner, three complete sets of a Manual of Operation and Maintenance for each of electrical and communications systems.
- B. Each manual shall consist of a 3-ring binder volume instructing Owner's personnel in operation and maintenance of system in question.
- C. All information shall be bound and secured in manual.
- D. Manual shall cover all phases of operation of equipment and shall be illustrated with photographs, drawings, and wiring diagrams.
- E. Manuals shall accurately describe operation, construction and adjustable features of complete

system and its component parts.

- F. Manual shall be complete with an equipment parts listing to facilitate ordering of spare and replacement parts.
- G. Each manual shall contain two sets of final shop drawings depicting equipment as installed.

#### 1.27 WARRANTIES

- A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten (10) days after completion of applicable item of work.
- B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form, contain full information, and are notarized.
- D. Co-execute submittals when required.
- E. Include Table of Contents and assemble in three D side ring, heavy duty binder with durable plastic cover.
- F. Time of Submittals:
  - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten (10) days after acceptance.
  - 2. Make other submittals within ten (10) days after Date of Substantial Completion, prior to final Application for Payment.
  - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten (10) days after acceptance, listing date of acceptance as beginning of warranty or bond period.

#### 1.28 IDENTIFICATION

- A. Entrance door to primary electrical room shall have porcelain enameled sign lettered "DANGER HIGH VOLTAGE". This same sign shall also be placed on primary switch.
- B. Each distribution and lighting panel shall be equipped with typewritten directory describing loads served. Directory shall be contained in steel frame mounted on inside face of panel's door and shall be covered with sheet of clear plastic.
- C. Switchboards, transformers, switchgear, telephone backboards, transfer switches, panels and cabinets shall be provided with 1/8-inch minimum thickness 5 ply lamecoid plastic nameplates indicating usage, plan designation and voltage where applicable. In Equipment and Mechanical Rooms, this identification may be on exterior of unit, in other areas identification shall be inside door or cover. Nameplates shall be black with white engraved lettering. Lettering shall be 1/2-inch high minimum. Fasten nameplates with escutcheon pins.

- D. Junction and pullboxes smaller than 12 inch x 12 inch shall be identified by using permanent marker on coverplate indicating originating panelboard and circuit(s) or system served.
- E. Junction and pull boxes with dimensions 12 inch x 12 inch and larger shall be stenciled or provided with permanent labels as follows:
1. Lighting and power feeders and branch circuits - 120, 208, 277, 480. Add "EM" for emergency circuits, ex. 120EM, etc.
  2. Medium voltage feeders - 5KV, 15KV, etc. as applicable for system voltage.
  3. Clock - CLK.
  4. Voice/Data communications - V/D COM.
  5. Fire Alarm - FA.
  6. Signal voltage lighting controls - LVLC.
  7. Area of rescue assistance system - RA.
  8. Master Antenna Television System - MATV.
  9. Nurse call system - NC.
  10. Building paging system - PA.
  11. Electronic Card Key Access System - CA.
- F. Branch wiring shall be color coded per industry standards.
- G. If Owner does not have a pre-established color code, use following colors unless otherwise required by code:
1. 120/208 volt systems.
    - a. A-phase: solid black.
    - b. B-phase: solid red.
    - c. C-phase: solid blue.
    - d. Different colors shall be used to identify switched legs.
    - e. Neutral conductor: solid white.
    - f. Provide additional markings for neutral conductors in the same raceway as required by code.
  2. 480/277 volt systems
    - a. A-phase: Solid brown.
    - b. B-phase: solid orange.
    - c. C-phase: solid yellow.
    - d. Different colors shall be used to identify switched legs.
    - e. Neutral conductor: solid gray.
    - f. Provide additional markings for neutral conductors in the same raceway as required by code.
- H. Where wires of different systems junction in common box, each cable shall be grouped with its own system and identified using tags or identification strips.
- I. For three phase systems, each phase shall be identified at all terminals using code markers.
- J. Cover plates for control stations controlling remote equipment shall be engraved to identify device being controlled.

- K. Motor starters, remote control stations, etc., shall be identified with engraved lamecoid nameplates fastened to equipment with escutcheon pins. Nameplates shall be 1/8 -inch 5 ply lamecoid with 1/4-inch white letters on a black background. Adhesive cloth labels, similar to those manufactured by Brady Label Co., may be used on motor switches and controls only, indicating number, designation, size and usage of motor.
- L. On inside of coverplates for light switches, occupancy sensors, receptacles, and special purpose outlets, provide a permanent label identifying panel and circuit number feeding device. Adhesive plastic tape will be permitted for this use.
- M. On light fixtures at wiring entrance point, provide permanent label identifying panel and circuit number feeding fixture. Adhesive plastic tape will be permitted for this use.
- N. Refer to individual specification sections for more specific or additional identification requirements.

#### 1.29 PREBID SURVEY

- A. Before submitting their bid, Contractor shall tour project site and review following items:
  - 1. Exact configuration of areas requiring demolition, temporary power, relocating, etc.
  - 2. Site conditions such as material storage, staging areas, parking, etc.
  - 3. Problems with work sequence.
- B. Any conditions found that are not shown on drawings or stated within project manual that may affect scope of work shall be reported to Engineer.

### **PART 2 PRODUCTS**

#### 2.1 FIRESTOPPING

- A. Firestopping materials shall include, but not be limited to, mortars, sealants and caulks, putties, collars, intumescent wrap strips mastics, and firestop pillows. Materials and methods used shall be recognized by an independent testing agency and shall have flame and temperature ratings assigned by specific agency.
- B. Materials using solvents or those requiring hazardous waste disposal shall not be used.
- C. Firestop assemblies shall meet fire test and hose stream test requirements of independent testing agency;
  - 1. Acceptable Manufacturers:
    - a. 3M Corporation.
    - b. Rectorseal Corporation.

#### 2.2 SLEEVES

- A. Sleeves: ASTM A53, Schedule 40 galvanized steel pipe.

### 2.3 ACCESS PANELS

- A. Access panels required by code or otherwise to electrical service equipment shall be supplied and installed by Electrical Contractor.

## **PART 3 EXECUTION**

### 3.1 FIRESTOPPING

- A. Openings in fire rated construction and annular spaces around conduits, cable trays, and other penetrating items shall be protected in accordance with NEC article 300-21 and in accordance with Wisconsin Administrative Code, Department of Commerce Chapter 51.049. Fire rating of protective seal shall be at least that of floor or wall into which it is installed, so that original fire rating of construction is maintained.
- B. Wall or floor penetration openings shall be as small as possible.
- C. Openings and annular spaces required by code to be protected, shall be protected.
- D. Installation of materials and assemblies shall be in strict accordance with manufacturer's instructions.

### 3.2 SLEEVES

- A. Where conduits, cables trays, or other electrical raceways must pass through floors or walls that are to be constructed of poured in place concrete, contractor shall provide sleeves in formwork prior to concrete pour. It shall be Electrical Contractor's responsibility to provide all sleeves for his work unless specifically indicated otherwise on drawings. Prior to installing sleeves, contractor shall prepare drawings indicating locations, quantities, sizes, and spacings of all sleeves anticipated. Drawings shall be forwarded to structural engineer for approval.
- B. Floor sleeves shall extend minimum of 2 inches above finished floor.

**END OF SECTION**

## SECTION 26 05 01

### MINOR ELECTRICAL DEMOLITION AND ALTERATIONS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Removal of existing electrical equipment, wiring, and conduit in areas to be remodeled.
  - 2. Removal of designated construction; dismantling, cutting and alterations for completion of Work.
  - 3. Disposal of materials.
  - 4. Storage of removed materials.
  - 5. Identification of utilities.
  - 6. Salvaged items.
  - 7. Protection of items to remain as indicated on Drawings.
  - 8. Relocate existing equipment to accommodate construction.
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  - 2. Section 26 00 00 – Basic Electrical Requirements.

##### 1.2 CLOSEOUT SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal Procedures: Procedures for closeout submittals.
- B. Division 01 – Basic Requirements: Record Drawings and Specifications: Record actual locations of capped utilities, conduits and equipment abandoned in place.

##### 1.3 QUALITY ASSURANCE

- A. Contractor shall notify the Engineer of any existing code violations observed during the course of performing his work. The Engineer will decide if corrective action needs to be taken. Corrective actions that change the scope of the work will be considered a change order and will be processed accordingly.

##### 1.4 SCHEDULING

- A. Division 01 – Basic Requirements: Coordination: Requirements for scheduling.
- B. Existing buildings shall remain in service during construction.
- C. Prior to demolition or alteration of structures, the following shall be accomplished:
  - 1. Owner release of such structure.

2. Disconnection of electrical power to equipment and circuits removed or affected by demolition work.
3. Electrical services rerouted or shut off outside area of demolition.
4. Coordinate sequencing with Owner and other Contractors.
5. Survey and record condition of existing facilities to remain in place that may be affected by demolition operations.

#### 1.5 COORDINATION

- A. Conduct demolition to minimize interference with adjacent and occupied building areas.
- B. Coordinate demolition work with Owner.
- C. Coordinate and sequence demolition so as not to cause shutdown of operation of surrounding areas.
- D. Shut-down Periods:
  1. Arrange timing of shut-down periods of in service panels with Owner. Do not shut down any utility without prior written approval.
  2. Keep shut-down period to minimum or use intermittent period as directed by Owner.
  3. Maintain life-safety systems in full operation in occupied facilities.
- E. Identify salvage items in cooperation with Owner. Owner may keep any equipment in demolition areas. Contractor shall deliver equipment owner wants salvaged to area in building designated by owner. Contractor shall remove all materials in demolished area not salvaged from site. Contractor shall obtain release of all materials before disposition.
- F. After demolition operations are completed, survey conditions and restore existing facilities to their pre-demolition condition.

#### **PART 2 PRODUCTS**

Not Used

#### **PART 3 EXECUTION**

##### 3.1 EXAMINATION

- A. Verify of existing conditions before starting work.
- B. Verify wiring and equipment indicated to be demolished serve only abandoned facilities.
- C. Verify termination points for demolished services.

##### 3.2 PREPARATION

- A. Erect, and maintain temporary safeguards, including warning signs and lights, barricades, and similar measures, for protection of public, Owner, Contractor's employees, and existing



improvements to remain.

- B. Temporary egress signage and emergency lighting.

### 3.3 DEMOLITION

- A. Remove exposed abandoned conduit. Cut conduit flush with walls and floors.
- B. Remove conduit, wire, boxes, and fastening devices to avoid any interference with new installation.
- C. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- D. Disconnect or shut off service to areas where electrical work is to be removed. Remove electrical fixtures, equipment, and related switches, outlets, conduit and wiring which are not part of final project.
- E. Install temporary wiring and connections to maintain existing systems in service during construction.
- F. Perform work on energized equipment or circuits with experienced and trained personnel.
- G. Remove, relocate, and extend existing installations to accommodate new construction.
- H. Repair adjacent construction and finishes damaged during demolition and extension work.
- I. Remove exposed abandoned grounding and bonding components, fasteners and supports, and electrical identification components. Cut embedded support elements flush with walls and floors.
- J. Clean and repair existing equipment to remain.
- K. Protect and retain power to existing active equipment remaining.
- L. Electrical equipment in conflict with construction shall be removed or relocated as indicated on drawings, as directed, or required.

### 3.4 MODIFICATIONS

- A. Feeders, branch circuits, and other system wiring which are to remain in service but which are presently routed through areas being demolished shall be rerouted around demolition area.
- B. Where existing branch circuits are to be extended or modified, existing conduit may be reused at Contractor's discretion. Existing wiring may be spliced and used to extent that it was not removed. Any existing conductors removed shall not be re-pulled and then reused.

### 3.5 EXISTING PANELBOARDS

- A. Ring out circuits in existing panel affected by the Work. Where additional circuits are needed, reuse circuits available for reuse. Install new breakers.
- B. Tag unused circuits as spare.
- C. Where existing circuits are indicated to be reused, use sensing measuring devices to verify circuits feeding Project area or are not in use.
- D. Remove existing wire no longer in use from panel to equipment.
- E. Provide new updated directories where more than three circuits have been modified or rewired.

### 3.6 SALVAGE ITEMS

- A. Remove and protect items requested by Owner to be salvaged and transport to location on site designated by Owner.

### 3.7 REUSABLE ELECTRICAL EQUIPMENT

- A. Carefully remove equipment, materials, or fixtures which are to be reused. Only items specifically identified as be reused shall be reused.
- B. Disconnect, remove, or relocate existing electrical material and equipment interfering with new installation.
- C. Relocate existing lighting fixtures as indicated on Drawings. Clean fixtures and re-lamp. Test fixture to see if it is in good working condition before installation at new location.

### 3.8 CLEANING

- A. Provide under provisions of Division 01 - Basic Requirements: Final Cleaning.
- B. Remove demolished materials as work progresses. Legally dispose materials.
- C. Keep workplace neat.

### 3.9 DISPOSAL

- A. Contractor shall tour demolition areas with Owner to determine status of all equipment to be removed during demolition.
- B. All equipment that is to be salvaged for reuse by the Owner shall be removed by Contractor and transported to an Owner designated storage area on site.

- C. Raceway, boxes and supporting devices shall become property of Contractor and shall be removed from site and disposed of by the Contractor.
- D. Removed equipment shall be disposed of by Contractor unless specifically otherwise indicated on drawings or requested by Owner. Contractor shall provide transport for disposal.

### 3.10 LIGHTING FIXTURE BALLAST DISPOSAL

- A. Contractor shall inspect all ballasts in all light fixtures removed as part of this project and take actions described below.
- B. All ballasts labeled as "NON PCB'S" or "NO PCB'S" shall be handled as described in other sections of these specifications which describe demolition or salvage materials handling. If PCB content is not stated on ballast label, ballast shall be handled as a PCB ballast.
- C. All PCB ballasts shall have wires clipped off and ballasts placed in US DOT approved type 17C or type 17H barrels and placed in storage in a location within building as designated by Owner. Contractor shall provide to Owner, in typewritten form, a total count of these ballasts and where they are stored.
- D. These ballasts are not to be removed from work site by Contractor.
- E. Contractor shall label and mark PCB storage barrels with EPA approved PCB labels and shall mark storage area with signs, marks, and lines to meet regulations of Wisconsin Code NR 157.
- F. Contractor shall provide approved PCB absorbent materials to be stored immediately adjacent to barrel storage area. Do not place loose absorbent material in barrels.
- G. When ballast demolition is completed and all PCB ballasts are placed in barrels ready to be picked up for disposal, Contractor shall notify Owner in writing so Owner can make arrangements for pick up and disposal of PCB ballasts.

### 3.11 LIGHTING FIXTURE LAMP DISPOSAL

- A. Contractor shall be responsible for proper removal and recycling of all existing fixture lamps being removed from service in accordance with EPA and State of Wisconsin DNR requirements. Lamps shall not be disposed of in any way except as described herein.
- B. Contractor shall be responsible for arranging for recycling of lamps by a licensed waste lamp and bulb recycler. Cost for recycling of removed lamps shall be included in Contractor's bid.
- C. Contractor shall carefully package removed lamps to prevent breakage. Contractor shall store waste lamps in a secure area, either in container that lamps are shipped in or in other ways so as to eliminate breakage. Both lamp storage area and individual containers should be labeled as hazardous waste. Store lamps in covered containers to prevent lamps from being broken as a result of other debris being placed on top of them.

3.12 ALTERATIONS

- A. Contractor shall be responsible for coordination of other trades to facilitate installation in existing building.
- B. Work shall include, but is not limited to, cutting, patching, refinishing and all work necessary and required to leave existing building in a condition acceptable to engineer.

3.13 PROTECTION OF FINISHED WORK

- A. Furnish under provisions of Division 01 - Basic Requirements: Protection of Installed Work.

**END OF SECTION**

## SECTION 26 05 03

### WIRING CONNECTIONS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Electrical Connections to Equipment.
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  - 2. Section 26 00 00 – Basic Electrical Requirements.
  - 3. Section 26 05 19 - Building Wire and Cable.
  - 4. Section 26 05 33 - Raceway and Boxes.

##### 1.2 REFERENCES

- A. National Electrical Manufacturers Association (NEMA):
  - 1. NEMA WD 1 - General Requirements for Wiring Devices.
  - 2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

##### 1.3 COORDINATION

- A. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
- B. Determine connection locations and requirements.
- C. Sequence rough-in of electrical connections to coordinate with installation of equipment.
- D. Sequence electrical connections to coordinate with start-up of equipment.

#### PART 2 PRODUCTS

##### 2.1 CORD AND PLUGS

- A. Attachment Plug Construction: Conform to NEMA WD 1.
- B. Configuration: NEMA WD 6; match receptacle configuration at outlet furnished for equipment.
- C. Cord Construction: Type SO multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
- D. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit over-current protection.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify equipment is ready for electrical connection, for wiring, and to be energized.

### **3.2 EXISTING WORK**

- A. Remove exposed abandoned equipment wiring connections, including abandoned connections above accessible ceiling finishes.
- B. Disconnect abandoned utilization equipment and remove wiring connections. Remove abandoned components when connected raceway is abandoned and removed. Install blank cover for abandoned boxes and enclosures not removed.
- C. Extend existing equipment connections using materials and methods as specified.

### **3.3 INSTALLATION**

- A. Make electrical connections.
- B. Make conduit connections to equipment using flexible conduit. Use liquid-tight flexible conduit with watertight connectors in damp or wet locations.
- C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
- D. Install receptacle outlet to accommodate connection with attachment plug.
- E. Install cord and cap for field-supplied attachment plug.
- F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
- G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
- H. Install terminal block jumpers to complete equipment wiring requirements.
- I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

### **3.4 ADJUSTING**

- A. Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation: Field inspecting, testing, adjusting, and balancing.

- B. Cooperate with utilization equipment installers and field service personnel during checkout and starting of equipment to allow testing and balancing and other startup operations. Provide personnel to operate electrical system and checkout wiring connection components and configurations.

**END OF SECTION**

## SECTION 26 05 19

### BUILDING WIRE AND CABLE

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Building Wire.
  - 2. Building Cable.
  - 3. Wiring Connectors.
  - 4. Connections.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  - 2. Section 26 00 00 – Basic Electrical Requirements.

##### 1.2 REFERENCES

- A. International Electrical Testing Association (NETA):
  - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
  
- B. National Fire Protection Association (NFPA):
  - 1. NFPA 70 - National Electrical Code (NEC).

##### 1.3 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years.

##### 1.4 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on Drawings.

##### 1.5 COORDINATION

- A. Division 01 - Basic Requirements: Coordination: Requirements for coordination.
  
- B. When wire and cable destination is indicated and routing is not shown, determine routing and lengths required.
  
- C. Wire and cable routing indicated is approximate unless dimensioned. Include wire and cable lengths within 10 feet of length shown.



## **PART 2 PRODUCTS**

### **2.1 BUILDING WIRE**

- A. Product Description: Single conductor insulated wire.
- B. Conductor: Copper only.
- C. Insulation Voltage Rating: 600 volts, rated 75 degrees C unless otherwise noted.
- D. In mechanical rooms, light fixtures, and others high temperature applications, insulation shall be rated 90 degrees C. or greater.
- E. Provide following wiring types:
  - 1. Concealed or exposed dry interior locations: Use only building wire Type THHN/THWN or XHHW insulation in raceway.
  - 2. Above Accessible Ceilings: Use only building wire Type THHN/THWN or XHHW insulation in raceway.
  - 3. Wet or Damp Interior Locations: Use only building wire Type XHHW-2 insulation in raceway.
  - 4. Exterior Locations: Use only building wire Type XHHW-2 insulation in raceway.
  - 5. Underground Locations: Use only building wire Type XHHW-2 or USE insulation, in raceway.
- F. Solid or Stranded conductor for 10 AWG and smaller. Conductor 8 AWG and larger shall be stranded.
- G. Conductor not smaller than 12 AWG for power and lighting circuits.
- H. Conductor not smaller than 14 AWG for control circuits.
- I. All wires shall be new, delivered to the site in unbroken cartons and shall be less than one year old out of manufacturer's stock.

### **2.2 WIRING CONNECTORS**

- A. Conductors No. 10 AWG and Smaller: Scotch 3M - Scotch-lok compression type solderless connectors with plastic cover.
- B. Joints, Taps, and Splices in Conductors No. 8 AWG and Larger: Solderless compression type connectors, tool and die applied, of a type that will not loosen under vibration or normal strains. Burndy "Hy-Dent" type or equivalent.
- C. Rubber insulating electrical tape: Scotch 3M model 23, 30-mil tape.
- D. Split bolt connectors are not acceptable.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Install in accordance with manufacturer's written instructions and in accordance with recognized industry practices.
- B. Run wire and cable in conduit, unless otherwise indicated on drawings.
- C. Do not draw conductors into conduits until building is enclosed and watertight and until work that may cause conductor damage has been completed.
- D. Voltage drop for branch circuits and feeder circuit combined shall not exceed requirements of NEC Article 215.
- E. Examine areas and conditions under which conductors are to be installed and notify Engineer in writing of conditions detrimental to proper and timely completion of work.
- F. Do not proceed with work until unsatisfactory conditions have been corrected.

### **3.2 JOINTS, TAPS AND SPLICES**

- A. Each tap, joint, or splice in conductors No. 8 AWG and larger shall be taped with two half-lap layers of vinyl plastic electrical tape and a finish wrap of color coding tape, where required by code.
- B. Cable splices shall be made only in distribution and junction boxes.

### **3.3 PREPARATION**

- A. Completely and thoroughly swab raceway before installing wire.

### **3.4 EXISTING WORK**

- A. Remove exposed abandoned wire and cable including abandoned wire and cable above accessible ceiling finishes.
- B. Patch surfaces where removed cables pass through building finishes.
- C. Disconnect abandoned circuits and remove circuit wire and cable.
- D. Remove abandoned boxes when wire and cable servicing boxes is abandoned and removed.
- E. Install blank cover for abandoned boxes not removed.
- F. Provide access to existing wiring connections remaining active and requiring access. Modify installation or install access panel.
- G. Extend existing circuits using materials and methods as specified.

- H. For additions to existing buildings, existing conductor color coding schemes shall be followed unless in conflict with codes. If no logical color coding scheme exists, color coding indicated above shall be followed.

### 3.5 INSTALLATION

- A. Route wire and cable to meet project conditions.
- B. Conductors shall not be installed at temperatures below manufacturer's minimum installation temperature.
- C. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- D. Identify each conductor with its panel and circuit number or other designation indicated.
- E. Special Techniques - Building Wire in Raceway:
  - 1. Pull conductors into raceway at same time.
  - 2. Install building wire 4 AWG and larger with pulling equipment.
- F. Special Techniques - Wiring Connections:
  - 1. Clean conductor surfaces before installing lugs and connectors.
  - 2. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
  - 3. Tape uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.
  - 4. Install solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
  - 5. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
  - 6. When 10 AWG and smaller stranded conductors are used install crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under screws.

### 3.6 BRANCH CIRCUIT CONDUCTORS

- A. Install branch circuits and switched circuits as required to comply with circuiting, switching, and control functions shown on drawings.
- B. Conductors shall be size 12 AWG minimum, unless otherwise noted, for branch circuit wiring, including motor circuits.
- C. Size 120V branch circuits for length of run on following basis:
  - 1. 0 to 75 ft. run from panelboard to first outlet: No. 12 AWG minimum.
  - 2. 75 to 125 ft. run: increase one wire size, No. 12 AWG becomes No. 10 AWG.
  - 3. 126 to 200 ft run: increase two wire sizes, No. 12 AWG becomes No. 8 AWG.
  - 4. 201 and above: wiring to be sized for 3 percent maximum voltage drop.

- D. Provide individual neutral conductors for branch circuits serving isolated ground receptacles and computer equipment. No common neutrals for these circuits.
- E. Route branch circuits and switch legs as dictated by construction, these specifications, or instruction from Engineer.
- F. Size conduit, outlet boxes, and other raceway system components in accordance with NEC requirements as minimum.
- G. Circuit numbers as shown on drawings are for Contractor to plan their wiring and for estimating purposes and are not necessarily exact circuit numbers to be used in specific panel for particular load.
- H. Exact circuit numbers for each load are to be selected by Contractor at their option.
- I. Balanced load on panelboard bus will be determining factor in arrangement of circuits. Panelboards average load shall not differ from phase to phase by plus or minus 7.5 percent.
- J. Motor and equipment branch wiring.
  - 1. Furnish and install motor circuits in accordance with schedules on drawings and code requirements, from source of supply to associated motor starter, and from starter to motor terminal box, including necessary and required intermediate connections.
  - 2. Conductor and conduit size for motor branch circuits, if shown on drawings, are sized for motor requirement only.
  - 3. Control wiring is not included in conduit sizes shown on drawings.
  - 4. Motors shall have proper conductor sizes as per NEC requirements and nameplate ratings.
  - 5. Contractor shall be responsible for verification of ratings of motors and installing proper branch circuits.
  - 6. Obtain manufacturer's wiring diagrams and shop drawings for equipment requiring electrical connections.
  - 7. Check drawings and specifications of other divisions of work for equipment and work, which shall be included in order to provide a complete electrical installation.
  - 8. Motor connections shall be made by compression type connectors using proper tools and fittings to assure good electrical continuity and low resistance joint.

### 3.7 FEEDER INSTALLATION

- A. Install in accordance with manufacturer's written instructions, and in accordance with recognized industry practices.
- B. Extend feeders at full capacity from origin to termination.
- C. Feeder conduits shall contain only those conductors constituting a single feeder circuit.
- D. Where feeder conductors are run in parallel, conductors shall be of same length, same material, circular-mil area, insulation type, and terminated in same manner.

- E. Where parallel feeder conductors run in separate raceways, each raceway shall have same physical characteristics.
- F. Feeders shall follow most accessible routes, concealed in construction in finished areas, exposed to minimum temperature gradient and to minimum temperature fluctuation.
- G. Confine feeders to insulated portions of building, unless otherwise specified.
- H. Trapped feeder runs without facilities for continuous drainage are not acceptable.
- I. Feeder conduits shall not be routed in conduit floor slabs or below basement or grade level floor slabs.
- J. Feeder conductors in switchboards, panelboards, pullboxes, gutters, and other open wiring spaces shall be bundled by feeder using plastic tie wraps at intervals not greater than 3 feet on center.

### 3.8 FIXTURE WIRES

- A. Use conductor with insulation suitable for current, voltage, and temperature to which conductor will be subjected.
- B. Provide minimum No. 12 wire size for conductors supplying power to a single fixture. 600V insulation minimum.
- C. Insulation suitable for operation at 90 degrees C. minimum for lighting fixtures with integral ballast, mogul base sockets, quartz lamps, or otherwise where subject to excessive temperatures.
- D. Fixture wiring shall be continuous wiring system to lampholder or to ballast and from ballast to lampholder.

### 3.9 WIRE COLOR

- A. General
  - 1. For wire sizes 10 AWG and smaller, install wire colors in accordance with following:
    - a. Black and red for single phase circuits at 120/240 volts.
    - b. Black, red, and blue for circuits at 120/208 volts single or three phase.
    - c. Brown, orange, and yellow for circuits at 277/480 volts single or three phase.
  - 2. For wire sizes 8 AWG and larger, identify wire with colored tape at terminals, splices and boxes. Colors are as follows:
    - a. Black and red for single phase circuits at 120/240 volts.
    - b. Black, red, and blue for circuits at 120/208 volts single or three phase.
    - c. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.

- B. Neutral Conductors: White. When two or more neutrals are located in one conduit, individually identify each with proper circuit number.
- C. Branch Circuit Conductors: Install three or four wire home runs with each phase uniquely color coded.
- D. Feeder Circuit Conductors: Uniquely color code each phase.
- E. Ground Conductors:
  - 1. For 6 AWG and smaller: Green.
  - 2. For 4 AWG and larger: Identify with green tape at both ends and visible points including junction boxes.

### 3.10 FIELD QUALITY CONTROL

- A. Division 01 - Basic Requirements: Quality Assurance / Quality Control of Installation: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.3.1.

**END OF SECTION**

## SECTION 26 05 26

### GROUNDING AND BONDING

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Rod electrodes.
  - 2. Wire.
  - 3. Grounding well components.
  - 4. Mechanical connectors.
  - 5. Exothermic connections.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  - 2. Section 26 00 00 – Basic Electrical Requirements.
  - 3. Section 26 05 19 - Building Wire and Cable.

##### 1.2 REFERENCES

- A. Institute of Electrical and Electronics Engineers (IEEE):
  - 1. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
  - 2. IEEE 1100 - Recommended Practice for Powering and Grounding Electronic Equipment.
  
- B. International Electrical Testing Association (NETA):
  - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
  
- C. National Fire Protection Association (NFPA):
  - 1. NFPA 70 - National Electrical Code.
  - 2. NFPA 99 - Standard for Health Care Facilities.

##### 1.3 SYSTEM DESCRIPTION

- A. Grounding systems use the following elements as grounding electrodes:
  - 1. Metal underground water pipe.
  - 2. Metal building frame.
  - 3. Concrete-encased electrode.
  - 4. Ground ring.
  - 5. Rod electrode.

#### 1.4 DESIGN REQUIREMENTS

- A. Provide all material, labor and incidentals necessary for the completion of this section of the work.

#### 1.5 PERFORMANCE REQUIREMENTS

- A. Grounding System Resistance: 5 ohms maximum.

#### 1.6 QUALITY ASSURANCE

- A. Provide grounding materials conforming to requirements of NEC, IEEE 142, and UL labeled.
- B. Perform Work in accordance with National Electric Code and state and local code requirements.

#### 1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and protect products under provisions of Division 01 – Basic Requirements: Transportation, Handling, Storage and Protection and product requirements.
- B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
- C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.
- D. Do not deliver items to project before time of installation. Limit shipment of bulk and multiple-use materials to quantities needed for immediate installation.

#### 1.9 COORDINATION

- A. Coordinate complete grounding and bonding of building reinforcing steel prior to concrete placement.

### **PART 2 PRODUCTS**

#### 2.1 ROD ELECTRODES

- A. Manufacturers:
  - 1. Galvan Industries/Erico Inc.
  - 2. LTV/Copperweld, Inc.
  - 3. Eritech/Erico, Inc.
  - 4. Lyncole XIT Grounding.



5. Harger Lightning and Grounding.
6. Substitutions: In accordance with Division 01 – Basic Requirements: Substitutions.

B. Product Description:

1. Material: Copper-clad steel.
2. Diameter: 3/4 inch.
3. Length: 10 feet.

- C. Connector: Connector shall be exothermic welded connection unless otherwise noted. Provide U-bolt clamp in ground test wells and where indicated on drawings.

2.2 WIRE

- A. Material: Stranded copper. Provide tin plated copper where exposed to corrosive environment.
- B. Connection to Electrodes: 2/0 AWG, minimum size.
- C. Grounding Electrode Conductor: Copper conductor, bare.
- D. Bonding Conductor: Copper conductor, bare.

2.3 GROUNDING WELL COMPONENTS

- A. Well Pipe: 8 inches NPS (DN200) by 24 inches long fiberglass pipe with belled end.
- B. Well Cover: Fiberglass with legend "GROUND" embossed on cover.

2.4 MECHANICAL CONNECTORS

A. Manufacturers:

1. Erico, Inc.
2. ILSCO Corporation.
3. O-Z Gedney Co.
4. Thomas & Betts, Electrical.
5. Burndy Electric.
6. Substitutions: In accordance with Division 01 – Basic Requirements: Substitutions.

- B. Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for particular installation.

2.5 EXOTHERMIC CONNECTIONS

A. Manufacturers:

1. Thermoweld.
2. Cadweld, Erico, Inc.
3. Harger Lightning Protection.
4. Exothermic Welding Co.

5. Thomas & Betts, Electrical.
  6. Substitutions: In accordance with Division 01 – Basic Requirements: Substitutions.
- B. Product Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Verify of existing conditions before starting work.
- B. Verify final backfill and compaction has been completed before driving rod electrodes.

#### **3.2 PREPARATION**

- A. Remove paint, rust, mill oils, and other surface contaminants at connection points.

#### **3.3 EXISTING WORK**

- A. Modify existing grounding system to maintain continuity to accommodate renovations.
- B. Extend existing grounding system using materials and methods as specified.

#### **3.4 INSTALLATION**

- A. Install in accordance with IEEE 142.
- B. Install rod electrodes near location of electric service entrance unless otherwise shown on drawings. Install additional rod electrodes, if required, to achieve specified resistance to ground.
- C. Install interconnecting wire 2 feet below finish grade.
- D. Install grounding and bonding conductors concealed from view.
- E. Install grounding well pipe with cover at rod locations as indicated on Drawings. Install well pipe top flush with finished grade.
- F. Bond together metal siding not attached to grounded structure; bond to ground.
- G. Bond together reinforcing steel and metal accessories in pool and fountain structures.
- H. Install ground grid under access floors as indicated on Drawings. Construct grid of 4 AWG bare copper wire installed on 24 inch centers both ways. Bond each access floor pedestal to grid.

- I. Bond together each metallic raceway, pipe, duct and other metal object entering space under access floors. Bond to underfloor ground grid. Install 2 AWG bare copper bonding conductor.
- J. Bond to lightning protection system. Refer to Division 26.
- K. Install continuous grounding using underground cold water system, driven ground rods, and building steel as grounding electrode.
- L. Ground electrical systems and equipment as required by code, utility, local ordinances, and to requirements herein.
- M. Install separate code rated grounding conductors to special equipment and activity areas as required by code.
- N. Bond all metallic piping systems and service equipment as required by NEC.
- O. Permanently attach grounding conductors prior to energizing equipment.
- P. Drive ground rods to a depth 4-inches below finished grade.
- Q. Grounding electrode conductor shall be continuous without splice from nearest building grounding electrode. Ground to service equipment. Install bonding jumper around water meter. Attach non-ferrous metal tag to warn against removal. Make connections to ground electrodes with approved molded exothermic weld process.

### 3.5 EQUIPMENT GROUND

- A. Bond metallic conduits, supports, cabinets, and other equipment so ground will be electrically continuous from service to outlet boxes.
- B. Permanently ground entire light and power system in accordance with NEC, including service equipment, distribution panels, lighting panelboards, switch and starter enclosures, motor frames, grounding type receptacles, and other exposed non-current carrying metal parts of electrical equipment.
- C. Accomplish grounding of electrical system by using insulated grounding conductor installed with feeders and branch circuit conductors in conduits.
- D. Size grounding conductors in accordance with NEC.
- E. Install from grounding bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes or metal enclosures of service equipment.
- F. Install grounding conductor in nonmetallic and flexible conduit to complete equipment ground continuity.

- G. Ground wire shall be bonded at equipment and at first junction box of conduit system on line side of flexible conduit to the system.
- H. Install grounding conductors to permit shortest and most direct path from equipment to ground.
- I. When grounding conductor runs through metallic conduit, bond to conduit at entrance and exit with a bolted clamp.
- J. Ground neutral at service only.
- K. Install a separate equipment grounding conductor in each conduit containing feeder conductors.
- L. Install a green equipment grounding conductor in all conduits serving branch circuits.
- M. Green ground bar in panels, where required to be similar to neutral bar, except tinted green and bonded to panel tub.
- N. Connections shall be accessible for inspection and checking.
- O. No insulation shall be installed over ground connections.
- P. Ground connection surfaces shall be cleaned and all connections shall be made so that it is impossible to move them.
- Q. Attach grounds permanently before permanent building service is energized.
- R. Ground metal lighting poles. Install a ground lug on inside wall of pole directly across from handhole.
- S. Install grounding and bonding in patient care areas to meet requirements of NFPA 99.

### 3.6 FIELD QUALITY CONTROL

- A. Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Grounding and Bonding: Perform inspections and tests listed in NETA ATS, Section 7.13. Make final grounding system measurements two days after latest rainfall.
- D. Perform ground resistance testing in accordance with IEEE 142. Contractor shall make ground resistance measurements. Measure in normally dry conditions, not less than 48 hours after rainfall.
- E. Perform leakage current tests in accordance with NFPA 99.

- F. Perform continuity testing in accordance with IEEE 142.
- G. When improper grounding is found on receptacles, check receptacles in entire project and correct. Perform retest.

**END OF SECTION**

## SECTION 26 05 33

### RACEWAY AND BOXES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Conduit.
  - 2. Tubing.
  - 3. Raceways.
  - 4. Wireways.
  - 5. Outlet Boxes.
  - 6. Pull Boxes.
  - 7. Junction Boxes.
  - 8. Handholes.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  - 2. Section 26 00 00 – Basic Electrical Requirements.

##### 1.2 REFERENCES

- A. American National Standards Institute (ANSI):
  - 1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
  - 2. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.
  - 3. ANSI C80.5 - Aluminum Rigid Conduit - (ARC).
  
- B. National Electrical Manufacturers Association (NEMA):
  - 1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
  - 2. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
  - 3. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
  - 4. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
  - 5. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
  - 6. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
  - 7. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

##### 1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and protect products under provisions of Division 01 – Basic Requirements: Transportation, Handling, Storage and Protection and product requirements.

- B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- C. Protect PVC conduit from sunlight.

#### 1.4 COORDINATION

- A. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.

### **PART 2 PRODUCTS**

#### 2.1 DESIGN REQUIREMENTS

- A. Minimum Raceway Size: 3/4 inch unless otherwise specified.

#### 2.2 METAL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Intermediate Metal Conduit (IMC): Rigid steel.
- C. Fittings and Conduit Bodies: NEMA FB 1; Fittings for metal raceways shall be steel or malleable iron and shall be zinc galvanized, or cadmium plated. Do not use aluminum or die cast fittings.

#### 2.3 PVC COATED METAL CONDUIT

- A. Product Description: NEMA RN 1; rigid steel conduit with external PVC coating, 40 mil thick.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit, PVC gasketed for mating surfaces

#### 2.4 FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction.
- B. Fittings: NEMA FB 1. Threaded, grounding type, insulated throat, two screw clamp type with locknuts, externally secured.
- C. Minimum size 1/2 inch with the exception that 3/8 inch diameter may be used in lengths not to exceed 6 foot, to serve individual lighting fixtures installed in a suspended accessible ceiling system.

#### 2.5 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction with PVC sunlight resistant jacket.

- B. Fittings: NEMA FB 1. Liquid tight, suitable for grounding, suitable for wet locations, tapered threaded hub, non-metallic materials.

## 2.6 ELECTRICAL METALLIC TUBING (EMT)

- A. Product Description: ANSI C80.3; galvanized tubing.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel or malleable iron, compression, threaded, insulated throat, gland compression type, rain and concrete tight type.

## 2.7 NONMETALLIC CONDUIT

- A. Product Description: NEMA TC 2; Schedule 40 or 80 PVC, UL listed, and as required by NEC. Sunlight resistant.
- B. Rated for 90 degrees C. cable.
- C. Fittings and Conduit Bodies: NEMA TC 3, schedule 40 or 80, to match conduit.
- D. Expansion fittings. PVC material, Carlon series E945 or equivalent.
- E. Expansion straps. PVC material, Carlon series E978 or equivalent.

## 2.8 EXPANSION FITTINGS

- A. Expansion fittings: Copper bonding jumper, Crouse-Hinds Type XJ.
- B. Expansion/deflection fittings: Copper bonding jumper, Crouse-Hinds Type XD.

## 2.9 WIREWAY

- A. Product Description: Oiltight and dust-tight type wireway.
- B. Knockouts: Manufacturer's standard.
- C. Size: Length as indicated on Drawings.
- D. Cover: Hinged cover with full gaskets.
- E. Connector: Flanged.
- F. Fittings: Lay-in type with drip shield.
- G. Finish: Rust inhibiting primer coating with gray enamel finish.

## 2.10 OUTLET BOXES

- A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
  - 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment



supported; furnish 1/2 inch (13 mm) male fixture studs where required.  
2. Concrete Ceiling Boxes: Concrete type.

B. Cast Boxes: NEMA FB 1, Type FD, aluminum. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.

C. Wall Plates for Finished Areas: As specified in Section 26 27 26.

D. Wall Plates for Unfinished Areas: Furnish gasketed cover.

#### 2.11 PULL AND JUNCTION BOXES

A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

B. Surface Mounted Cast Metal Box: NEMA 250, Type 4X; flat-flanged, surface mounted junction box:

1. Material: Cast aluminum.

2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

C. In-Ground Cast Metal Box: NEMA 250, Type 6, outside flanged, recessed cover box for flush mounting:

1. Material: Cast aluminum.

2. Cover: Nonskid cover with neoprene gasket and stainless steel cover screws.

3. Cover Legend: "ELECTRIC".

D. Polymer concrete composite Handholes: Die-molded, polymer concrete composite hand holes:

1. Cable Entrance: Pre-cut 6 inch x 6 inch cable entrance at center bottom of each side.

2. Cover: polymer concrete composite, weatherproof cover with nonskid finish. Secure cover with stainless steel hex bolts.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

#### 3.2 EXISTING WORK

A. Remove exposed abandoned raceway. Cut raceway flush with walls and floors, and patch surfaces.

B. Remove concealed abandoned raceway to its source.

C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.

- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installations using materials and methods as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.
- G. Cutting and patching
  - 1. Provisions for openings, holes, and clearances through walls, floors, ceilings, and partitions shall be made in advance of construction.
  - 2. Provide cutting and patching as necessary for installation of electrical systems, subject to approval of Owner.
  - 3. Contractor shall secure the approval of Owner for all anticipated floor sleeves for installation of electrical conduits in existing buildings, prior to starting any such work.
  - 4. Contractor shall locate embedded conduits before core drilling in existing floors. Ground detector systems will be acceptable.
  - 5. Patching of holes and openings resulting from work of this branch shall be responsibility of this Contractor. All painting of patched surfaces shall match existing paint color.

### 3.3 RESTRICTIONS

- A. Split, crushed, or scarred conduit is not acceptable.
- B. Welded conduit is not acceptable.
- C. Do not route conduit over boiler, under boiler or in slabs below boiler, incinerator, or other high temperature equipment.
- D. PVC conduit may not be used in the interior of building except at following locations.
  - 1. PVC conduit may be used for grounding conductors.
  - 2. Greenhouses.
  - 3. Pool Equipment Rooms.

### 3.4 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements.
- B. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- C. Underground More than 5 feet outside Foundation Wall: Provide schedule 40 nonmetallic conduit, unless otherwise noted on drawings.

- D. Provide cast metal boxes in pavement or sidewalks and nonmetallic handhole in grass areas, unless otherwise noted.
- E. Underground Within 5 feet from Foundation Wall: Provide rigid steel conduit.
- F. In or Under Slab on Grade: Provide schedule 40 nonmetallic conduit.
- G. Outdoor Locations, Above Grade: Provide rigid steel conduit, unless otherwise noted. Provide cast metal outlet, pull, and junction boxes.
- H. In Slab Above Grade: Feeder conduit shall not be installed in slab. Provide schedule 40 nonmetallic conduit with EMT elbow so any conduit above slab shall be metallic.
- I. Wet and Damp Locations: Provide rigid steel conduit. Provide cast metal junction and pull boxes. Provide flush mounting outlet box in finished areas.
- J. Concealed Dry Locations: Provide rigid steel, intermediate metal conduit or electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.
- K. Exposed Dry Locations: Provide rigid steel, intermediate metal conduit or electrical metallic tubing, unless otherwise noted. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.
- L. Provide separate conduit system for each of the following systems:
  1. 208 volt normal power wiring systems.
  2. 208 volt code required emergency power wiring systems (load side of transfer switch).
  3. 208 volt optional emergency power wiring systems (load side of transfer switch).
  4. Medium voltage wiring systems.
  5. Low voltage lighting control systems.
  6. Lightning Protection Systems
  7. Voice/data communications raceway systems.
  8. Low voltage control wiring.

### 3.5 INSTALLATION

- A. Install Work in accordance with State and Municipality standards.
- B. All conduits containing service entrance conductors shall be rigid metal conduits.
- C. Ground and bond raceway and boxes in accordance with Section 26 05 26.
- D. Fasten raceway and box supports to structure and finishes.
- E. Arrange raceway and boxes to maintain headroom and present neat appearance.

### 3.6 INSTALLATION - RACEWAY

- A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.
- B. Arrange raceway supports to prevent misalignment during wiring installation.
- C. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- D. Group related raceway; support using conduit rack; provide space on each for 25 percent additional raceways.
- E. Secure conduits in place with malleable corrosion-proof alloy straps or hangers. Conduit straps used in corrosive areas shall be PVC coated.
- F. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports.
- G. Do not attach raceway to ceiling support wires or other piping systems.
- H. Route exposed raceway parallel and perpendicular to walls.
- I. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
- J. Route conduit under slab from point-to-point.
- K. Conduits routed within concrete construction such as poured walls, floor slabs, topping slabs, shall comply with following requirements.
  - 1. Conduits shall be parallel to each other, spaced on center to center distance of at least three times conduit trade diameter, and provided with a minimum of 2 inches of concrete.
  - 2. Contractor shall note that precast planks below topping slabs may camber. Topping slab thickness will be less at high point of camber.
  - 3. Conduits larger than 1-1/4 inch inside diameter shall not be installed in floor slabs. Conduits over 3/4 inch ID shall not be installed in topping slabs.
  - 4. Conduits embedded in a structural frame slab shall comply with applicable provisions of American Concrete Institute (ACI), Standard 318. Refer to structural drawings for locations of structural frames.
  - 5. Conduits used for feeders shall not be embedded in concrete floor slabs or concrete topping slabs.
  - 6. Conduits in poured concrete construction shall not cross other conduits or other piping.
  - 7. Unless specifically indicated on electrical drawings, conduits installed in poured concrete construction shall be approved by Structural Engineer prior to conduit installation.

8. Contractor will be required to submit drawings showing conduit sizes and routings to Structural Engineer for their review. Approval may not be given prior to bidding. Contractors who base their bid on assumption that conduits will be allowed in concrete construction do so at their own risk. No changes will be made to contract if, during construction, Structural Engineer prohibits installation of conduit in concrete construction.
  9. In areas constructed of precast concrete conduits may be run in cores of planks.
- L. Maintain clearance between raceway and piping for maintenance purposes.
  - M. Maintain 12-inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
  - N. Where conduits must cross or follow the same path as water, steam or other fluid piping, run electrical conduits above such piping wherever possible.
  - O. Cut conduit square using saw or pipe cutter; de-burr cut ends.
  - P. Bring conduit to shoulder of fittings; fasten securely.
  - Q. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
  - R. Install conduit hubs to fasten conduit to cast boxes in damp and wet locations.
  - S. Install no more than equivalent of three 90 degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install hydraulic one-shot bender to fabricate or factory elbows for bends in metal conduit larger than 2-inch size.
  - T. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
  - U. Provide a watertight conduit system where installed in wet locations such as underground, or where embedded in concrete.
  - V. Install fittings to accommodate expansion and deflection where raceway crosses seismic, control and expansion joints.
  - W. Install suitable pull string or cord in each empty raceway except sleeves and nipples.
  - X. Install suitable caps to protect installed conduit against entrance of dirt and moisture.
  - Y. Close ends and unused openings in wireway.
  - Z. Conduit runs that extend through areas of different temperature or atmospheric conditions or that are partly indoors and partly outdoors shall be sealed, drained, and installed in a manner that will prevent drainage of condensed or entrapped moisture into cabinets, motors, or

equipment enclosures.

- AA. Conduit connections at motors, transformers, and other equipment that vibrates.
  - 1. Flexible metal conduit between 18 inches and 36 inches long for conduit connections at equipment that vibrates.
  - 2. Liquid-tight flexible metal conduit where flexible connections are required and where conduit will be exposed to moisture, dirt, fumes, oil, corrosive atmosphere, etc. Provide with connectors to assure a liquid-tight, permanently grounded connection. Locate so it is least subject to physical abuse. Corrosive areas are identified on floor plan.
  - 3. Use double locknuts and insulated bushings with threads fully engaged.
- BB. Direct buried underground conduit.
  - 1. Exterior underground direct buried conduits shall be buried at a depth of not less than 30 inches below grade.
  - 2. Provide conduits or ducts terminating below grade with means to prevent entry of dirt or moisture.
  - 3. Underground conduits shall slope 1/8 inch per foot for proper drainage. Conduits shall drain toward manholes and junction boxes, not the electrical equipment.

### 3.7 INSTALLATION - BOXES

- A. Install wall mounted boxes at elevations to accommodate mounting heights as indicated on Drawings.
- B. Adjust box location up to 10 feet prior to rough-in to accommodate intended purpose.
- C. Orient boxes to accommodate wiring devices oriented as specified in Section 26 27 26.
- D. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- E. In Accessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- F. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- G. Do not install flush mounting box back-to-back in walls; install with minimum 6 inches separation. Install with minimum 24 inches separation in acoustic rated walls.
- H. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- I. Install stamped steel bridges to fasten flush mounting outlet box between studs.
- J. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

- K. Install adjustable steel channel fasteners for hung ceiling outlet box.
- L. Do not fasten boxes to ceiling support wires or other piping systems.
- M. Support boxes independently of conduit.
- N. Install gang box where more than one device is mounted together. Do not use sectional box.
- O. Install gang box with plaster ring for single device outlets.

### 3.8 INTERFACE WITH OTHER PRODUCTS

- A. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation specified in Division 07.
- B. Locate outlet boxes to allow luminaires positioned as indicated on Drawings.
- C. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

### 3.9 ADJUSTING

- A. Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation: Field inspecting, testing, adjusting, and balancing.
- B. Adjust flush-mounting outlets to make front flush with finished wall material.
- C. Install knockout closures in unused openings in boxes.

### 3.10 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Clean exposed surfaces and restore finish.

**END OF SECTION**

## SECTION 26 07 00

### ELECTRICAL UTILITY SERVICES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Coordination and arrangements with Electric Utility Company for permanent electric service; payment of Electric Utility Company charges for service; service provisions; and utility metering equipment.
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern Work under this Section.
  - 2. Division 03 - Concrete: Concrete pads.

##### 1.2 REFERENCES

- A. Local Electric Utility's Installation and Service Manual.
- B. Local Electric Utility's Service Rules and Regulations.

##### 1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with Electric Utility Company's written requirements.
- B. Maintain one copy of each document on site.

#### PART 2 PRODUCTS

##### 2.1 ELECTRICAL SYSTEM DESCRIPTION

- A. Electric Utility Company Contact: Mr. Joe Pimaggio, Alliant Energies at 608-845-1103.
- B. System Characteristics: 208Y/120 volts, three phase, four-wire, 60 Hertz.
- C. Service Entrance: Underground.

##### 2.2 UTILITY METERS

- A. Furnished by Electric Utility Company.

##### 2.3 UTILITY METER BASE

- A. Furnished by Contractor to meet Electric Utility company requirements.



2.4 METERING TRANSFORMER CABINET

- A. Furnished by Contractor to meet Electric Utility company requirements.

2.5 TRANSFORMER PAD

- A. Provide transformer pad to meet requirements of Electric Utility Company.

**PART 3 EXECUTION**

3.1 EXAMINATION

- A. Verify service equipment is ready to be connected and energized.

3.2 EXISTING WORK

- A. Remove exposed abandoned service entrance raceway and conductors. Cut raceway flush with walls and floors, and patch surfaces.
- B. Disconnect abandoned service equipment and remove.
- C. Maintain access to existing service equipment, boxes, metering equipment, and other installations remaining active and requiring access. Modify installation or provide access panel.
- D. Extend existing service installations using materials and methods compatible with existing electrical installations, as specified.
- E. Clean and repair existing service equipment to remain or to be reinstalled.
- F. Outages:
  - 1. Contractor shall be cognizant of importance of maintaining continuous operation of building electrical systems.
  - 2. Demolition work shall therefore be conducted in such a manner that outages of any portion of these systems will be of short duration, infrequent, at convenience of Owner and scheduled in advance.
  - 3. If critical circuits or feeders are affected by demolition, Contractor shall provide necessary temporary wiring as required to maintain normal operation.
  - 4. Work that is done to existing service and distribution will require careful coordination and planning to minimize outages. Contractor shall confer with Owner, Construction Manager and Electric Utility.

3.3 PREPARATION

- A. Confirmation of Electric Service. Consult with Electric Utility to verify service information specified herein and shown on Drawings before submitting bid.

- B. Contractor shall meet with Electric Utility prior to rough in to review and coordinate installation of electrical service and verify existing conditions and any special requirements.
- C. Metering: Consult with Electric Utility regarding service entrance requirements and metering equipment.
- D. Install metering equipment and empty conduit for metering conductors to meet standards and requirements of Electric Utility.
- E. Electric Utility Charges. Include in Base Bid Electric Utility charges for electrical service.
- F. Service installation shall comply with latest applicable standards of utility and National Electric Code. Refer to current electrical service installation manuals.

#### 3.4 INSTALLATION

- A. Underground Service Provisions:
  - 1. Contractor shall provide:
    - a. Install service entrance conduits to building service entrance equipment.
  - 2. Utility Company will connect service lateral conductors to service entrance conductors.
- B. Install cast-in-place concrete pad for Electric Utility Company transformer, in accordance with Section 03 31 00 – Structural Concrete.

**END OF SECTION**

## SECTION 26 24 16

### PANELBOARDS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Distribution Circuit Panelboards.
  - 2. Branch Circuit Panelboards.
  - 3. Electronic Grade Branch Circuit Panelboards.
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  - 2. Section 26 00 00 – Basic Electrical Requirements.
  - 3. Section 26 05 26 - Grounding and Bonding.

##### 1.2 REFERENCES

- A. Institute of Electrical and Electronic Engineers (IEEE):
  - 1. IEEE C62.41 – Recommended Practice on Surge Voltages in Low Voltage AC Power Circuits.
- B. National Electrical Manufacturers Association (NEMA):
  - 1. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.
  - 2. NEMA FU 1 – Low Voltage Cartridge Fuses.
  - 3. NEMA ICS 2 – Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
  - 4. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
  - 5. NEMA KS 1 – Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
  - 6. NEMA PB 1 - Panelboards.
  - 7. NEMA PB 1.1 - General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less.
- C. International Electrical Testing Association (NETA):
  - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- D. National Fire Protection Association (NFPA):
  - 1. NFPA 70 - National Electrical Code.
- E. Underwriters Laboratories Inc. (UL):
  - 1. UL 67 - Safety for Panelboards.
  - 2. UL 1283 – Electromagnetic Interference Filters.
  - 3. UL 1449 – Transient Voltage Surge Suppressors.

### 1.3 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal Procedures.
- B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker arrangement and sizes.
- C. Product Data: Submit catalog data showing specified features of standard products.

### 1.4 CLOSEOUT SUBMITTALS

- A. Division 01 – Basic Requirements: Contract Closeout Procedures for closeout submittals.
- B. Project Record Documents: Record actual locations of panelboards and record actual circuiting arrangements.
- C. Operation and Maintenance Data: Submit spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

### 1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years experience.

### 1.6 MAINTENANCE MATERIALS

- A. Division 01 – Basic Requirements: Spare Parts and Maintenance Materials.
- B. Furnish two of each panelboard key. Panelboards shall be keyed alike.

### 1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Do not store panelboards exposed to weather.
- B. Protect panelboards against damage from work of other trades.

## **PART 2 PRODUCTS**

### 2.1 DISTRIBUTION PANELBOARDS

- A. Manufacturers:
  - 1. Square D, I-line Series.
  - 2. GE Electrical.
  - 3. Siemens.
  - 4. Cutler-Hammer.
  - 5. Substitutions: In accordance with Division 01 - Basic Requirements: Substitutions.
- B. Product Description: NEMA PB 1, circuit breaker type panelboard.

- C. Panelboard Bus: Copper, current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard. Bus shall be rated per panelboard schedule, 100 amp minimum.
- D. Minimum integrated short circuit rating: 10,000 amperes rms symmetrical for 240 or 208 volt panelboards; 14,000 amperes rms symmetrical for 480 volt panelboards, unless otherwise indicated on Drawings. Panels shall be fully rated, series rating is not acceptable.
- E. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type, circuit breakers with integral thermal and instantaneous magnetic trip handle for all poles. No handle ties of any sort will be approved. Provide circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.
- F. Circuit Breaker Accessories: Trip units as indicated on Drawings.
- G. Enclosure: NEMA PB 1, Type 1 indoors, 3R outdoor and damp or wet locations, maximum 9.5 inches deep, 42 inches wide, cabinet box.
- H. Provide cabinet front with hinged door with flush lock. Front cover shall allow access to wiring gutters without removal of panel trim. Hinged trim shall be held in place with screw fasteners. Finish in manufacturer's standard gray enamel.
- I. Where indicated on drawings, provide TVSS unit mounted integral to panel. TVSS unit shall meet Section 26 35 53 requirements.

## 2.2 BRANCH CIRCUIT PANELBOARDS

- A. Manufacturers:
  1. Square D, NQOD or NF Series.
  2. GE Electrical.
  3. Siemens.
  4. Cutler-Hammer.
  5. Substitutions: In accordance with Division 01 - Basic Requirements: Substitutions.
- B. Product Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.
- C. Panelboard Bus: Copper, current carrying components, ratings as indicated on Drawings, 100 amp minimum. Furnish copper ground bus in each panelboard.
- D. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical for 208 volt or 240 volt panelboards; 14,000 amperes rms symmetrical for 480 volt panelboards, unless otherwise indicated on Drawings. Panels shall be fully rated, series rating is not acceptable.
- E. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles; no handle ties of any sort will be approved. Type HACR for air conditioning equipment circuits, HID rated for high intensity discharge

lighting systems, or as indicated on Drawings.

- F. Provide metal directory holders with clear plastic covers.
- G. Do not use tandem circuit breakers.
- H. Enclosure: NEMA PB 1, Type 1 indoors, Type 3R outdoors and damp or wet locations.
- I. Cabinet Box: 6 inches deep, 20 inches (508 mm) wide.
- J. Furnish wiring gutters in accordance with NEC.
- K. Top or bottom feed as required.
- L. Furnish with branch breaker positions and nominal current rating as indicated on Drawings.
- M. Fronts:
  - 1. Dead front safety type.
  - 2. Door shall be built into panel front cover trim which allows access to breakers as well as to trim screw fasteners. Front cover construction with concealed trim screws and door hinges. Breaker access door shall have the following features:
    - a. Concealed piano hinge.
    - b. Flush stainless steel cylinder tumbler type lock with spring loaded door pulls.
    - c. Locks keyed alike.
    - d. Code gauge steel with rust inhibiting primer and baked enamel finish.
- N. Circuit Directory:
  - 1. Suitable for complete descriptions.
  - 2. Clear plastic cover.
  - 3. Typewritten card, describing the loads served.
  - 4. Provide steel frame holder on inside cover of door to hold directory. Directory shall be covered with a sheet of clear plastic.

### **PART 3 EXECUTION**

#### **3.1 EXISTING WORK**

- A. Maintain access to existing panelboard remaining active and requiring access. Modify installation or provide access panel.
- B. Clean and repair existing panelboards to remain or to be reinstalled.

#### **3.2 INSTALLATION**

- A. Install in accordance with manufacturer's written instruction, applicable requirements of NEC, NECA's "Standard of Installation," NEMA PB1.1, and in accordance with recognized industry practices.

- B. Install flush or surface mounted as specified on drawings and schedules.
- C. Support panel cabinets independently to structure with no weight bearing on conduits.
- D. Install recessed panelboards to allow cover to be drawn tight against wall to provide neat appearance.
- E. Install surface mounted panelboard interior so there is no gap between the panelboard back-box and cover.
- F. Adjacent panel cabinets shall be of same size and mounted in horizontal alignment.
- G. Attach nameplates. Nameplates for panels in public areas shall be attached to the inside face of the cover. Nameplates for panels in equipment rooms and other non-public areas shall be attached to the outside face of the cover.
- H. Install panelboards plumb.
- I. Height: 6 feet to top of panelboard; install panelboards taller than 6 feet with bottom no more than 4 inches above floor.
- J. Install filler plates for unused spaces in panelboards.
- K. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes to balance phase loads.
- L. Install spare conduits out of each recessed panelboard to accessible location: (2) 1 inch to above ceiling, (2) 1 inch to floor below. Identify each as SPARE.
- M. Ground and bond panelboard enclosure according to Section 26 05 26. Connect equipment ground bars of panels in accordance with NFPA 70.

### 3.3 FIELD QUALITY CONTROL

- A. Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation: Field inspecting, testing, adjusting, and balancing.

### 3.4 INSPECTION

- A. Examine area to receive new panelboards to assure adequate clearance for installation.
- B. Start work only after unsatisfactory conditions are corrected.
- C. Inspect and test in accordance with NETA ATS, except Section 4.
- D. Perform circuit breaker inspections and tests listed in NETA ATS, Section 7.6.

3.5 ADJUSTING

- A. Adjust doors and operating mechanisms for free mechanical movement.
- B. Tighten lugs and bus connections.
- C. Clean interior of panelboard.
- D. Sand, prime and paint scratched or marred surfaces to match original finish.
- E. Measure steady state load currents at each panelboard feeder; rearrange circuits in panelboard to balance phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.

**END OF SECTION**



## **SECTION 26 27 26**

### **WIRING DEVICES**

#### **PART 1 GENERAL**

##### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Wall Switches.
  - 2. Wall Dimmers.
  - 3. Receptacles.
  - 4. Multi-Outlet Assembly.
  - 5. Occupancy Sensors.
  - 6. Device Plates.
  - 7. Decorative Box Covers.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  - 2. Section 26 05 33 - Raceway and Boxes.

##### **1.2 REFERENCES**

- A. National Electrical Manufacturers Association (NEMA):
  - 1. NEMA WD 1 - General Requirements for Wiring Devices.
  - 2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

##### **1.3 QUALIFICATIONS**

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

#### **PART 2 PRODUCTS**

##### **2.1 GENERAL**

- A. Provide all wiring device types from a single manufacturer.
  - 1. Use of a manufacturer's name and model or catalog number is for purpose of establishing standard of quality and general configuration desired.
  - 2. Substitutions: In accordance with Division 01 - Basic Requirements: Substitutions.
  
- B. Devices and Cover Plate Colors:
  - 1. Coordinate device and cover plate color with final wall finish; verify color with Engineer/Architect before ordering.
  - 2. Unless noted otherwise, receptacles and light switches controlling emergency or critical loads shall be red in color.

3. Adjustments in device or cover plate color shall be made in the field without additional compensation.

C. Unless otherwise indicated acceptable manufacturers are:

1. Hubbell.
2. Leviton.
3. Arrow-Hart, Inc.
4. Pass & Seymour.
5. Substitutions: As approved by Engineer.

## 2.2 WALL SWITCHES

A. Switches:

1. Single Pole Switch: 20 amps, 120-277 volt, specification grade, back or side wired equal to Hubbell cat. No. HBL1221.
2. Double Pole Switch: 20 amp, 120-277 volt, specification grade, back or side wired equal to Hubbell cat. No. HBL1222.
3. Pilot Light (lighted) - Single Pole Switch: 20 amp, 120-277 volt, specification grade, clear polycarbonate toggle, back or side wired equal to Hubbell cat. No. HBL1221ILC.

## 2.3 RECEPTACLES

A. General:

1. Receptacles shall be flush mounted.
2. Receptacles shall have full grounding straps and be suitable for side or side and back wiring.
3. Receptacles shall be Hubbell Nos. listed below or equal by approved manufacturer.
4. Unless noted otherwise, receptacles shall be 125 volt, 2 pole, 3 wire grounding.

B. Receptacles

1. Single Convenience Receptacle Where a single receptacle is wired to a dedicated 20 ampere: heavy duty, specification grade, 20 amp, 125 volt, NEMA 5-20R Hubbell cat. No. HBL5361.
2. General use Duplex Convenience Receptacle: heavy duty, specification grade, 15 amp, 125 volt, NEMA 5-15R Hubbell cat. No. HBL5262.
3. Duplex Receptacle Where a single duplex receptacle is wired to a dedicated 20 ampere: heavy duty, specification grade, 20 amp, 125 volt, NEMA 5-20R Hubbell cat. No. 5362.
4. Weather-Resistant: Corrosion resistant heavy duty, specification grade, 20 amp duplex, 125 volt, NEMA 5-20R, HBL53CM62 (Color – Yellow)
5. GFCI Receptacle: heavy duty, specification grade, self-testing, 20 amp, 125 volt, NEMA 5-20R, UL 2006 compliant, Hubbell cat. No. GFST20.
6. Weather-Resistant GFCI: Extra heavy duty grade, 20 amp duplex, 125 volt, NEMA 5-20R, UL 2006 compliant, Hubbell cat. No. GFR5362.

- C. Weatherproof Cover Plate: Gasketed die cast metal plate with hinged and gasketed device covers. Cover shall allow cords to be plugged in and cover closed. Provide Intermatic WP1010MC for single duplex receptacles or WP1030MC for double (quad) duplex receptacles.
- D. Receptacles fed from emergency circuits shall be red.

#### 2.4 WALL PLATES

- A. Provide wall plates for wiring devices, with ganging and cutouts as indicated and with metal screws for securing plates to devices, screw heads colored to match finish of plate.
- B. Device plates for surface mounted 4 inch square boxes; 1/2-inch raised galvanized steel covers.
- C. Do not use jumbo cover Plates.
- D. Weatherproof Cover Plate: Gasketed die cast metal plate with hinged and gasketed device covers. Cover shall allow cords to be plugged in and cover closed. Provide Intermatic WP1010MC for single duplex receptacles or WP1030MC for double (quad) duplex receptacles.
- E. Plates for devices fed from emergency circuits shall be red.

### **PART 3 EXECUTION**

#### 3.1 EXAMINATION

- A. Verify outlet boxes are installed at proper height.
- B. Verify wall openings are neatly cut and completely covered by wall plates.
- C. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

#### 3.2 PREPARATION

- A. Clean debris from outlet boxes.

#### 3.3 EXISTING WORK

- A. Disconnect and remove abandoned wiring devices.
- B. Modify installation to maintain access to existing wiring devices to remain active.
- C. Clean and repair existing wiring devices to remain or to be reinstalled.

### 3.4 INSTALLATION

- A. Switches controlling equipment operation of which is not evident from switch position shall include pilot light in conjunction with proper switch.
- B. Each switch shall be complete with engraved plate to identify equipment being controlled. Provide black letters on clear background, 1/8-inch high, minimum.
- C. Do not install devices until after wall finishes have been completely applied.
- D. Any outlets installed prior to walls being finished and used for construction power shall be replaced at time of substantial completion.
- E. Install devices and wall plates plumb and level.
- F. Install switches with OFF position down.
- G. Install receptacles with grounding pole on top.
- H. Connect wiring device grounding terminal to outlet box with bonding jumper and branch circuit equipment grounding conductor.
- I. Route continuous green equipment grounding conductor with branch circuit conductors serving isolated ground receptacles. Terminate equipment ground on isolated ground bus in panelboards.
- J. Install emergency switches, which occur adjacent to normal light switches in separate boxes to maintain systems isolation in accordance with the NEC.
- K. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
- L. Connect wiring devices by wrapping solid conductor around screw terminal. Install stranded conductor for branch circuits 10 AWG and smaller.
- M. When stranded conductors are used in lieu of solid, use crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under device screws.
- N. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
- O. Do not use terminals on wiring devices (hot or neutral) for feed-through connections, looped or otherwise make circuit connections via wire connectors and pigtails.
- P. Provide a layer of electrical tape around perimeter sides of each wiring device so that terminations are insulated.
- Q. Where GFI protected receptacles are indicated on Drawings, each receptacle indicated shall be a GFI receptacle. Standard receptacles protected with an upstream GFI receptacle shall not be approved.

- R. Multiple or Special Switch Stations:
  - 1. Grouped local switches under common cover plate as scheduled or noted on the drawings. Provide pilot lights on all circuits remote from general area or exterior to building. Eight-gang plate maximum - where two plates are required, same shall be equal in size and located one above the other. Switch plates shall include an engraved, Bakelite nameplate to identify function of each switch. Nameplate shall be screwed in place.

### 3.5 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations of outlet boxes provided under Section 26 05 33 – Raceway and Boxes to obtain mounting heights as indicated on Drawings.
- B. Coordinate installation of wiring devices with floor box service fittings.

### 3.6 FIELD QUALITY CONTROL

- A. Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation: Field inspecting, testing, adjusting, and balancing.
- B. Inspect each wiring device for defects.
- C. Operate each wall switch with circuit energized and verify proper operation.
- D. Verify each receptacle device is energized.
- E. Test each receptacle device for proper polarity.
- F. Test each GFCI receptacle device for proper operation.
- G. If a device fails to properly operate, replace at no extra charge to Owner.

### 3.7 ADJUSTING

- A. Devices and face plates on a common wall with common mounting heights shall be level and square to each other. Adjustments required after installation shall be made without additional compensation.
- B. Mark conductors with panel and circuit number serving device, at device.
- C. Mark panel and circuit number serving device on backside of device plate with a permanent marking system that does not show through front of plate.

### 3.8 CLEANING

- A. Clean exposed surfaces to remove splatters and restore finish.

**END OF SECTION**

## SECTION 26 28 19

### ENCLOSED SWITCHES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Fusible and Non-fusible switches.
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  - 2. Section 26 00 00 – Basic Electrical Requirements.

##### 1.2 REFERENCES

- A. National Electrical Manufacturers Association (NEMA):
  - 1. NEMA FU 1 - Low Voltage Cartridge Fuses.
  - 2. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
- B. International Electrical Testing Association (NETA):
  - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

##### 1.3 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal Procedures.
- B. Product Data: Submit switch ratings and enclosure dimensions.

##### 1.4 CLOSEOUT SUBMITTALS

- A. Division 01 – Basic Requirements: Contract Closeout Procedures: Procedures for closeout submittals.
- B. Project Record Documents: Record actual locations of enclosed switches and ratings of installed fuses.

##### 1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years experience.

## **PART 2 PRODUCTS**

### **2.1 FUSIBLE SWITCH ASSEMBLIES**

- A. Manufacturers:
  - 1. Square D.
  - 2. Cutler Hammer/Westinghouse.
  - 3. Siemens.
  - 4. General Electric.
  - 5. Substitutions: In accordance with Division 01 - Basic Requirements: Substitutions.
- B. Product Description: NEMA KS 1, Type HD with externally operable handle interlocked to prevent opening front cover with switch in ON position, enclosed load interrupter knife switch. Provide means to temporarily override interlock and allow door to be opened with switch on.
- C. Fuse clips: Designed to accommodate NEMA FU 1, Class R fuses.
- D. Enclosure: NEMA KS 1, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel.
  - 1. Interior Dry Locations: Type 1.
  - 2. Exterior Locations: Type 3R.
  - 3. Wet Locations: Type 4.
- E. Service Entrance: Switches identified for use as service equipment are to be labeled for this application. Furnish solid neutral assembly and equipment ground bar.
- F. Furnish switches with entirely copper current carrying parts.
- G. Provide ANSI/UL Class RK1, dual element, time delay, 600 volt fuses in disconnect switches, sized as shown on drawings.
- H. Quick make and break operator mechanism.
- I. Handle attached to box, not cover.
- J. Handle position indication, ON in up position and OFF in down position.
- K. Padlock provisions for up to three padlocks in OFF position.
- L. UL listed lugs for type and size of wire specified.
- M. Spring reinforced fuse clips for Type R fuses.
- N. Provisions for insulated or grounded neutral.

## 2.2 NONFUSIBLE SWITCH ASSEMBLIES

- A. Manufacturers:
  - 1. Square D.
  - 2. Cutler Hammer/Westinghouse.
  - 3. Siemens.
  - 4. General Electric.
  - 5. Substitutions: In accordance with Division 01 - Basic Requirements: Substitutions.
- B. Product Description: NEMA KS 1, Type HD with externally operable handle interlocked to prevent opening front cover with switch in ON position enclosed load interrupter knife switch. Provide means to temporarily override interlock and allow door to be opened with switch on.
- C. Enclosure: NEMA KS 1, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel.
  - 1. Interior Dry Locations: Type 1.
  - 2. Exterior Locations: Type 3R.
  - 3. Wet Locations: Type 4.
- D. Service Entrance: Switches identified for use as service equipment are to be labeled for this application. Furnish solid neutral assembly and equipment ground bar.
- E. Furnish switches with entirely copper current carrying parts.
- F. Quick make and break operator mechanism.
- G. Handle attached to box, not cover.
- H. Handle position indication, ON in up position and OFF in down position.
- I. Padlock provisions for up to three padlocks in OFF position.
- J. UL listed lugs for type and size of wire specified.
- K. Provisions for insulated or grounded neutral.

## 2.3 SWITCH RATINGS

- A. Switch Rating: Horsepower rated for AC or DC as indicated on Drawings.
- B. Short Circuit Current Rating: UL listed for 200,000 rms symmetrical amperes when used with or protected by Class R fuses (30-600 ampere switches employing appropriate fuse rejection schemes).



## **PART 3 EXECUTION**

### **3.1 EXISTING WORK**

- A. Disconnect and remove abandoned enclosed switches.
- B. Maintain access to existing enclosed switches and other installations remaining active and requiring access. Modify installation or provide access panel.
- C. Clean and repair existing enclosed switches to remain or to be reinstalled.

### **3.2 INSTALLATION**

- A. Provide disconnect switches for loads as required by code. Review HVAC and Plumbing specifications to determine what equipment is furnished with disconnect switches.
- B. Install all disconnect switches whether furnished under this contract.
- C. Electrical Contractor shall determine need for a disconnect switch requirements for each specific load.
- D. Contractor shall include in their bid all disconnect switches required whether indicated on the drawings or not.
- E. Install enclosed switches plumb.
- F. Height: 5 feet to operating handle.
- G. Install fuses for fusible disconnect switches.
- H. Apply adhesive tag on inside door of each fused switch indicating NEMA fuse class and size installed.
- I. Install in accordance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation," and in accordance with recognized industry practices.
- J. Locate disconnect switches as shown on drawings or as required by NEC.
- K. Install on equipment support where feasible, or anchor firmly to wall or structural surface.
- L. Provide control circuit interlock as required by NEC.

### **3.3 ADJUSTMENT**

- A. Adjust covers and operating mechanism for free mechanical movement.
- B. Verify overcurrent protection to provide proper operation and compliance with NEC.

- C. Tighten wire and cable connections.
- D. Clean interior of enclosure.
- E. Touch up scratched or marred surfaces to match original finish.

3.4 FIELD QUALITY CONTROL

- A. Division 01 - Basic Requirements: Quality Assurance / Quality Control of Installation: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.5.

**END OF SECTION**

**SECTION 26 51 00**  
**INTERIOR LIGHTING**

**PART 1 GENERAL**

1.1 SUMMARY

- A. Section Includes:
  - 1. Interior Luminaires.
  - 2. Interior Lamps.
  - 3. Ballasts.
  - 4. Accessories.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  - 2. Section 26 00 00 – Basic Electrical Requirements.

1.2 REFERENCES

- A. American National Standards Institute (ANSI):
  - 1. ANSI C82.1 - Electric Lamp Ballast-Line Frequency Fluorescent Lamp Ballast.
  - 2. ANSI C82.4 - Ballasts-for High-Intensity-Discharge and Low-Pressure Sodium Lamps (Multiple-Supply Type).

1.3 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal Procedures.
  
- B. Shop Drawings:
  - 1. Include outline drawings, catalog cut sheets, lamp and ballast data, support points, weights, accessory information, and performance data for each luminaire type.
  - 2. For all luminaries with paint color or finish options, include single color original of manufacturers color or finish choices for Architects review.
  
- C. Product Data: Submit dimensions, ratings, and performance data.
  
- D. Record Drawings: For installations utilizing remotely mounted low voltage transformers, Electrical Contractor shall provide set of record drawings indicating location of installed transformers to facilitate future maintenance.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

## **PART 2 PRODUCTS**

### **2.1 GENERAL – INTERIOR LIGHTING**

- A. Furnish all labor, materials, tools, equipment, and services for all interior lighting, as indicated, in accordance with provisions of Construction Documents.
- B. Completely coordinate with work of all other trades.
- C. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for sound, secure and complete installation.

### **2.2 INTERIOR LUMINAIRES**

- A. Subject to compliance with requirements, fixtures that may be incorporated into work include products specified in lighting fixture schedule on Drawings, and equals listed in accompanying notes.
- B. Basic catalog number only is indicated in lighting fixture schedule. Electrical Contractor shall furnish complete lighting fixtures in quantities, and row lengths as shown on Drawings, including plaster frames, ends, or caps, couplings, connectors, suspension assemblies, mounting brackets and all auxiliary accessories as required.
- C. Reference schedule for description of fixture nomenclature and associated ceiling type and suspension system.
- D. Housing:
  - 1. Shall be free from burrs, sharp corners and edges.
  - 2. Shall be steel, unless noted otherwise, formed and supported to prevent warping and sagging.
  - 3. Provide spring loaded latches for all troffers.
- E. Mounting Accessories:
  - 1. Recessed fixtures:
    - a. Provide trim type and accessories required for installation in ceiling types specified shown on reflected ceiling plan.
    - b. Fixtures mounted in sloped ceilings shall be provided with sloped ceiling adapters and appropriate trim rings and other accessories as required.
  - 2. Surface mounted fixtures: Provide ceiling spacers as required for fixtures not labeled as suitable for direct mounting to a low density ceiling.
  - 3. Suspended fixtures:
    - a. Provide swivel canopy to accommodate any sloped ceilings shown on plans.
    - b. Provide pendant or cable length required to suspend luminaires at indicated height.
    - c. Swivel hangers in mechanical equipment areas shall be shock absorbing type.

- F. Finishes:
1. Painted finishes shall be polyester powder painted enamel finish, and painted after fabrication unless noted otherwise.
  2. Polished, brushed or other metal finishes shall be finished with clear coat to inhibit finish deterioration and corrosion.
  3. Finish types and colors shall be verified with Architect/Engineer prior to ordering.
- G. Louvers, Reflectors, Lenses:
1. Louvers and reflectors shall be semi-specular, low iridescent, clear alzak, unless noted otherwise.
  2. Parabolic louver depth shall have minimum actual dimension of 3 inches, unless noted otherwise.
  3. Acrylic lenses shall be pattern 12 prismatic, overall 0.125 inch minimum thickness.

### 2.3 FLUORESCENT BALLASTS

- A. Manufacturers:
1. Advance Transformer.
  2. Universal.
  3. Osram/Sylvania.
  4. Substitutions: As approved by Engineer.
- B. Product Description: Electronic ballast, Program Start, suitable for lamps specified, with universal input voltage that will accept any line voltage between 120-277 volts, unless noted as 480 volt on drawings.
- C. Fluorescent ballasts shall be electronic type, unless noted otherwise, and shall meet the following standards:
1. UL Listed (Class P) Sound Rating A and CSA certified.
  2. Comply with EMI and RFI limits set by FCC (CFR 47 part 18) or NEMA and not interfere with normal electrical equipment.
  3. Meet applicable standards designated by ANSI.
  4. Be potted or conformal coated in metallic case and not contain PCB's.
  5. Provide normal rated lamp life as stated by lamp manufacturers with rated life at 3 hour burn time for each start.
- D. Compact fluorescent ballasts shall be electronic type, unless noted otherwise, and shall meet the following requirements, in addition to those listed above:
1. Provide with ballast shut-off circuit for protection of ballast at end of lamp life.
- E. Nominal power factor of 0.95 or higher.
- F. Total harmonic distortion of less than 10 percent at 120 or 277 volts.
- G. Ballast factor 0.85 or better.

- H. Frequency of operation shall be 20 khz – 50 khz and units shall operate without visible flicker.
- I. Operating temperature shall not exceed 65 degrees C at any point on case at 40 degree C ambient.
- J. Ballasts shall carry minimum three (3) year warranty covering replacement parts and labor for life of warranty.
- K. Ballasts shall be marked with manufacturer's name, part number, supply voltage, power factor, open circuit voltage, current draw for each lamp type and UL Listing.
- L. Ballasts shall withstand line transients as defined in IEEE 587, Category A.
- M. Fluorescent ballasts, other than electronic type, shall only be used where specifically noted on Drawings, shall be of High Power Type, CBM and ETL Certified, Best Energy Saving Type and Sound Rated where available.
- N. Luminaires located within same room shall be tandem wired, masterslave, or provided with three (3) lamp ballasts in following areas:
  - 1. One (1) lamp or three (3) lamp fluorescent luminaries recess mounted within ten (10) feet center-to-center of each other.
  - 2. One (1) lamp or three (3) lamp fluorescent luminaries pendant or surface mounted within one (1) foot edge-to-edge of each other.

## 2.4 LAMPS

- A. General – Lamps:
  - 1. Lamps shall be provided new.
  - 2. Approved manufacturers;
    - a. Fluorescent:
      - 1) Philips.
      - 2) Osram/Sylvania.
      - 3) General Electric.
      - 4) Substitutions: As approved by Engineer.
- B. Fluorescent:
  - 1. Color temperature: 3,500K unless noted otherwise.
  - 2. Minimum Color Rendering Index (CRI): 85 unless noted otherwise.
  - 3. Non-compact lamps:
    - a. Lamp life: Minimum 20,000 hours average based on three hours per start when used on rapid start circuits.
    - b. Lamps shall be 32 watt, T8, minimum 2,900 lumens initial, rapid start, unless noted otherwise.
    - c. Lamps shall meet EPA TCLP standards for disposal as non-hazardous waste.

## **PART 3 EXECUTION**

### **3.1 EXISTING WORK**

- A. Disconnect and remove abandoned luminaires, lamps, and accessories.
- B. Extend existing interior luminaire installations using materials and methods as specified.
- C. Clean and repair existing interior luminaires to remain or to be reinstalled.

### **3.2 INSTALLATION**

- A. Install suspended luminaires using pendants supported from swivel hangers. Install pendant length required to suspend luminaire at indicated height.
- B. Locate recessed ceiling luminaires as indicated on Drawings. Coordinate all discrepancies between lighting and reflected ceiling plans with architect.
- C. Install surface mounted luminaires plumb and adjust to align with building lines and with each other. Secure to prevent movement.
- D. Install recessed luminaires to permit removal from below.
- E. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating.
- F. Install earthquake clips to secure recessed grid-supported luminaires in place.
- G. Install wall-mounted luminaires at height as indicated on Drawings.
- H. Install accessories furnished with each luminaire.
- I. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.
- J. Install specified lamps in each luminaire.
- K. Electrical Contractor shall check Structural Drawings, General Construction Drawings and Mechanical Drawings to verify construction and type of surface on or in which lighting fixtures are installed.
  - 1. Determine specific ceiling construction including ceiling materials and ceiling suspension system in each area where suspended ceiling is to be provided.
  - 2. Verify suspended ceiling type with ceiling contractor prior to releasing lighting fixtures for delivery.
  - 3. Furnish fixture of type scheduled complete with accessories necessary to make installation accordance with manufacturer's recommendations including plaster frames, couplings and connectors, suspension assemblies mounting brackets and other auxiliary equipment.

- L. Bond fixtures and metal accessories to branch circuit equipment grounding conductor.
- M. Fixture Connections:
  - 1. Surface and wall recessed fixtures shall be connected directly to junction box or solid conduit.
  - 2. Ceiling recessed fixtures shall be connected to flexible metal conduit, originating at solidly supported J-Box.
  - 3. Flexible metal conduit shall be minimum 3/8 inch diameter. Conduit length shall allow movement of fixture for maintenance purposes.
  - 4. Minimum wire size shall be #12 AWG.
- N. Provide box-outs and other accessories around recessed fixtures as required to maintain fire ratings for spacing required from insulation in ceiling space. Final installation shall meet regulatory requirements and manufacturer's recommendations.
- O. Contractor shall verify exit signs are provided and visible along all exit paths shown on Architectural Life Safety Plan.

### 3.3 FIELD QUALITY CONTROL

- A. Operate each luminaire after installation and connection.
- B. Inspect for proper connection and operation.

### 3.4 ADJUSTING

- A. Aim and adjust luminaires as indicated on Drawings and adjust as directed by designated Owner personnel.

### 3.5 CLEANING

- A. Remove dirt and debris from enclosures.
- B. Clean photometric control surfaces as recommended by manufacturer.
- C. Clean finishes and touch up damage.

### 3.6 PROTECTION OF FINISHED WORK

- A. Division 01 - Basic Requirements: Protection of Installed Work.
- B. Relamp luminaires having failed or noticeable dim lamps at Substantial Completion.

**END OF SECTION**



**SECTION 26 56 00**  
**EXTERIOR LIGHTING**

**PART 1 GENERAL**

1.1 SUMMARY

- A. Section Includes
  - 1. Exterior Luminaries.
  - 2. Poles.
  - 3. Accessories.
- B. Related Sections
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  - 2. Section 26 00 00 – Basic Electrical Requirements.

1.2 REFERENCES

- A. American National Standards Institute (ANSI):
  - 1. ANSI C82.1 - Electric Lamp Ballast-Line Frequency Fluorescent Lamp Ballast.
  - 2. ANSI C82.4 - Ballasts-for High-Intensity-Discharge and Low-Pressure Sodium Lamps (Multiple-Supply Type).
  - 3. ANSI O5.1 - Wood Poles, Specifications and Dimensions.

1.3 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal Procedures.
- B. Shop Drawings: Indicate dimensions and components for each luminaire not standard Product of manufacturer.
- C. Product Data: Submit dimensions, ratings, and performance data.
- D. Samples: Submit two color chips 3 x 3 inch in size illustrating luminaire finish color where indicated in luminaire schedule.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and protect products under provisions of Division 01 – Basic Requirements: Transportation, Handling, Storage and Protection.

- B. Store and handle solid wood poles in accordance with ANSI O5.1.

## 1.6 COORDINATION

- A. Furnish bolt templates and pole mounting accessories to installer of pole foundations.

## PART 2 PRODUCTS

### 2.1 LUMINARIES

- A. Product Description: Complete exterior luminaire assemblies, with features, options, and accessories as scheduled.
- B. Substitutions: In accordance with Division 01 - Basic Requirements: Substitutions.

### 2.2 HIGH INTENSITY DISCHARGE (HID) BALLASTS

- A. Manufacturers:
  1. Duro-Test Corp.
  2. General Electric Co.
  3. Philips Electronics North America.
  4. Radiant Lamp Co.
  5. Siemens Corp.
  6. Venture Lighting International Inc.
  7. Substitutions: In accordance with Division 01 - Basic Requirements: Substitutions.
- B. Product Description: ANSI C82.4, metal halide high pressure sodium lamp ballast, suitable for lamp and environmental conditions specified, with voltage to match luminaire voltage.

### 2.3 HID LAMPS

- A. Manufacturers:
  1. Duro-Test Corp.
  2. General Electric Co.
  3. Philips Electronic North America.
  4. RCS Industries North America.
  5. Siemens Corp.
  6. Substitutions: In accordance with Division 01 - Basic Requirements: Substitutions.

### 2.4 METAL POLES

- A. Material and Finish: As indicated on Drawings.
- B. Section Shape and Dimensions: As indicated on Drawings.
- C. Height: As indicated on Drawings.
- D. Base: Nonbreakaway.

- E. Accessories:
  - 1. Handhole.
  - 2. Anchor bolts.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Verify foundations are ready to receive fixtures.

#### **3.2 EXISTING WORK**

- A. Disconnect and remove abandoned exterior luminaries.
- B. Extend existing exterior luminaire installations using materials and methods as specified.
- C. Clean and repair existing exterior luminaries to remain or to be reinstalled.

#### **3.3 INSTALLATION**

- A. Install concrete bases for lighting poles at locations as indicated on Drawings, in accordance with Division 03: Section 03 31 00 – Structural Concrete.
- B. Install poles plumb.
- C. Install lamps in each luminaire.
- D. Bond and ground luminaries, metal accessories, and metal poles in accordance with Section 26 05 26. Install supplementary grounding electrode at each pole.

#### **3.4 FIELD QUALITY CONTROL**

- A. Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation: Field inspecting, testing, adjusting, and balancing.
- B. Operate each luminaire after installation and connection. Inspect for improper connections and operation.
- C. Measure illumination levels to verify conformance with performance requirements.
- D. Take measurements during night sky, without moon or with heavy overcast clouds effectively obscuring moon.

#### **3.5 ADJUSTING**

- A. Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation: Field inspecting, testing, adjusting, and balancing.

- B. Aim and adjust luminaries to provide illumination levels and distribution as indicated on Drawings.

3.6 CLEANING

- A. Division 01 - Basic Requirements: Final cleaning.
- B. Clean photometric control surfaces as recommended by manufacturer.
- C. Clean finishes and touch up damage.

3.7 PROTECTION OF FINISHED WORK

- A. Division 01 - Basic Requirements: Protection of Installed Work: Protecting finished work.
- B. Relamp luminaries having failed lamps at Substantial Completion.

**END OF SECTION**

## SECTION 28 23 03

### VIDEO FLOW MONITORING

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Stationary cameras, control equipment, and accessories.
  - 2. Wiring.
  - 3. Computer software.
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.

##### 1.2 SYSTEM DESCRIPTION

- A. Description: Video flow monitoring at points as indicated on Drawings.
  - 1. One system at Babcock Dam.
  - 2. One system at LaFollette Dam.
- B. Configuration: NTSC, with 1 volt peak-to-peak across 75 ohms.
- C. Design, provide, and install complete camera system including software for camera viewing and control.

##### 1.3 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal Procedures.
- B. Shop Drawings: Provide system wiring diagram.
- C. Product Data:
  - 1. Submit camera specification sheet
  - 2. Power Over Ethernet switch (POE) specification sheet
  - 3. Router specification. sheet.
- D. Software: Provide computer system requirements, installation instructions, and system back-up disk.

##### 1.4 CLOSEOUT SUBMITTALS

- A. Division 01 – Basic Requirements: Contract Closeout Procedures.
- B. Operation and Maintenance Data: Submit instructions for operating system and performing routine trouble shooting procedures.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Conform to manufacturer's standard service conditions during and after installation of components.

1.6 MAINTENANCE SERVICE

- A. Furnish service and maintenance of video surveillance system for one year from Date of Substantial Completion.

**PART 2 PRODUCTS**

2.1 CAMERAS

- A. Product Description: Two (2) Mobotix M 12 D cameras at each location.
  - 1. No substitutions.

2.2 SWITCHING EQUIPMENT

- A. Product Description: Router for exterior electrical box mounting.

2.3 INTERNET CONNECTION

- A. Owner to provide Internet connection to electrical box.

2.4 ELECTRICAL EQUIPMENT CABINET

- A. Product Description: Install in Exterior NEMA 4X electrical box as indicated on Drawings.

**PART 3 EXECUTION**

3.1 INSTALLATION

- A. Ground and bond video flow monitoring equipment.
- B. Wire cameras to electrical cabinet.
- C. Mount equipment and connect to Internet.
- D. Install software on two of Owner's computers (P.C.'s).

3.2 MANUFACTURER'S FIELD SERVICES

- A. Furnish manufacturer's field representative to supervise final wiring connections and system adjustments.

3.3 DEMONSTRATION AND TRAINING

- A. Furnish two (2) hours of instruction to Owner, to be conducted with supplier's representative.

**END OF SECTION**

## SECTION 31 05 13

### SOILS FOR EARTHWORK

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Subsoil materials.
  - 2. Topsoil materials.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern Work under this Section.
  - 2. Section 02 41 13 – Site Demolition.
  - 3. Section 31 05 16 – Aggregates for Earthwork
  - 4. Section 31 22 13 - Rough Grading.
  - 5. Section 31 23 17 – Site Excavation, Backfill, and Compaction.
  - 6. Section 31 25 13 - Erosion Controls: Slope protection and erosion control.
  - 7. Section 32 01 00 – Site Restoration.

##### 1.2 REFERENCES

- A. State of Wisconsin Department of Transportation
  - 1. Standard Specifications for Highway and Structure Construction, Current Edition. (WISDOT)
  
- B. ASTM International (American Society for Testing and Materials)
  - 1. ASTM D2487 - Classification of Soils for Engineering Purposes (Unified Soil Classification System).
  - 2. ASTM D5268 – Topsoil Used for Landscaping Purposes.
  
- C. Erosion Control and Storm Water Management – Chapter 14 of Dane County Ordinances.

##### 1.3 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal Procedures.

##### 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with Wisconsin Department of Transportation standards and Dane County Ordinances.

## **PART 2 PRODUCTS**

### **2.1 SUBSOIL MATERIALS**

- A. Subsoil Type S1:
  - 1. Excavated and re-used material.
  - 2. Graded.
  - 3. Free of lumps larger than 3 inches, rocks larger than 2 inches, debris and organic material.
  
- B. Subsoil Type S2:
  - 1. Imported borrow.
  - 2. Graded.
  - 3. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
  - 4. Imported subsoil and borrow shall be similar in composition when compared to existing site subsoil.
  - 5. Contractor shall provide 10 lb sample of proposed imported borrow material to laboratory for soil classification analysis conforming to ASTM D2487.

### **2.2 TOPSOIL MATERIALS**

- A. Topsoil Type T1:
  - 1. Excavated and reused material.
  - 2. Graded.
  - 3. Soil shall be free of roots, twigs, stones, subsoil, debris, weeds, and foreign matter larger than 1/2 inch.
  - 4. Topsoil shall be evaluated in accordance with ASTM D5268.
  
- B. Topsoil Type T2:
  - 1. Imported borrow.
  - 2. Friable loam.
  - 3. Soil shall be free of roots, twigs, stones, subsoil, debris, weeds, and foreign matter larger than 1/2 inch.
  - 4. Acidity range (pH) of 5.5 to 7.5.
  - 5. Containing minimum of 4 percent and maximum of 25 percent inorganic matter.
  - 6. Limit decaying matter to 5 percent of total content by volume.
  - 7. Topsoil shall be evaluated in accordance with ASTM D5268.

### **2.3 SOURCE QUALITY CONTROL**

- A. Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation: Testing and analysis of soil material.
  
- B. Testing and Analysis of Topsoil Material designated for Landscaping Purposes: Perform in accordance with ASTM D5268.



C. Furnish materials of each type from same source throughout the Work.

**PART 3 EXECUTION**

Not Used

**END OF SECTION**

## SECTION 31 05 16

### AGGREGATES FOR EARTHWORK

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Aggregate materials and designations for structure aggregate base course.
  - 2. Aggregate materials and designations for pavement aggregate base course.
  - 3. Aggregate materials and designations for backfill.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern Work under this Section.
  - 2. Section 02 41 13 – Site Demolition.
  - 3. Section 31 05 13 – Soils for Earthwork.
  - 4. Section 31 22 13 - Rough Grading.
  - 5. Section 31 23 17 – Site Excavation, Backfill, and Compaction.
  - 6. Section 31 25 13 - Erosion Controls: Slope protection and erosion control.
  - 7. Section 32 11 23 - Aggregate Base Course.

##### 1.2 REFERENCES

- A. ASTM International:
  - 1. ASTM C33 – Standard Specification for Concrete Aggregates.
  - 2. ASTM C136 – Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  
- B. State of Wisconsin Department of Transportation:
  - 1. Standard Specifications for Highway and Structure Construction, Current Edition. (WISDOT).
  
- C. Erosion Control and Storm Water Management – Chapter 14 of Dane County Ordinances.

##### 1.3 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal Procedures.
  
- B. Product Data: Submit gradation information for each type of aggregate specified. Gradation results shall be taken within the past (3) months from contract date.
  
- C. Materials Source: Submit name of source of imported materials.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with Wisconsin Department of Transportation standards and Dane County Ordinances.

**PART 2 PRODUCTS**

2.1 AGGREGATE MATERIALS

- A. Aggregate Type A1 (Gravel): Crushed Gravel: free of organic matter and debris; graded in accordance with:
  - 1. WISDOT 3/4-Inch Gradation.
- B. Aggregate Type A2 (Gravel): Crushed Gravel: free of organic matter and debris; graded in accordance with:
  - 1. WISDOT 1-1/4-Inch Gradation.
- C. Aggregate Type A6 (3/8-Inch Stone Chips): Crushed stone; free of clay, shale, organic matter; graded in accordance with the following limits:

<u>Sieve Size</u>	<u>Percent Passing</u>
1/2-inch	100
3/8-inch	90 - 100
No. 8	0 - 15
No. 30	0 - 3

- D. Aggregate Type A8 (Pea Gravel): Fractured, washed, free of clay, shale, organic matter; graded in accordance with the following limits:
  - 1. Minimum Size: 1/4-inch.
  - 2. Maximum Size: 3/8-inch.
- E. Aggregate Type A13 (Sand Fill): Natural river or bank sand; free of silt, clay, or loam, friable or soluble materials, or organic matter; consisting of durable particles ranging in size from fine to coarse in uniform combinations; maximum moisture content shall be 10 percent, graded within following limits:

<u>Sieve Size</u>	<u>Percent Passing</u>
3/8-inch	100
No. 4	95 - 100
No. 8	75 - 90
No. 16	55 - 75
No. 30	30 - 50
No. 50	10 - 25
No. 100	2 - 10
No. 200	0

- F. Aggregate Type A14 (Stone): Crushed Stone; free of clay, shale, organic matter; graded in accordance with ASTM C33, Size No. 2.

## 2.2 SOURCE QUALITY CONTROL

- A. Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation: Testing and analysis of aggregates.
- B. When tests indicate materials do not meet specified requirements, change material or material source and retest.
- C. Furnish materials of each type from same source throughout the Work.

## **PART 3 EXECUTION**

Not Used

**END OF SECTION**

**SECTION 31 22 13**  
**ROUGH GRADING**

**PART 1 GENERAL**

1.1 SUMMARY

- A. Section Includes:
1. Removal of topsoil and subsoil.
  2. Cutting, grading, filling, rough contouring and compacting site for building pads and pavements.
- B. Related Sections:
1. Applicable provisions of Division 01 – Basic Requirements shall govern Work under this Section.
  2. Section 02 41 13 – Site Demolition.
  3. Section 31 05 13 – Soils for Earthwork.
  4. Section 31 05 16 – Aggregates for Earthwork.
  5. Section 31 23 17 – Site Excavation, Backfill, and Compaction.
  6. Section 31 25 13 – Erosion Controls.
  7. Section 32 01 00 – Site Restoration: Restoration of areas disturbed or damaged during construction.

1.2 REFERENCES

- A. State of Wisconsin Department of Transportation.
1. Standard Specifications for Highway and Structure Construction, Current Edition. (WISDOT)
- B. ASTM International (American Society for Testing and Materials)
1. ASTM C136 – Test Method For Sieve Analysis of Fine and Coarse Aggregates.
  2. ASTM D698 – Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort 12,400 ft.-lbf/ft<sup>3</sup>.
  3. ASTM D1557 - Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort 56,000 ft.-lbf/ft<sup>3</sup>.
  4. ASTM D6938 – Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
- C. Erosion Control and Storm Water Management – Chapter 14 of Dane County Ordinances.

1.3 CLOSEOUT SUBMITTALS

- A. Division 01 – Basic Requirements: Contract Closeout Procedures: Requirements for project closeout submittals. Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- A. Topsoil: Type T1 or T2 as specified in Section 31 05 13 – Soils for Earthwork.
- B. Subsoil Fill: Type S1 or S2 as specified in Section 31 05 13 – Soils for Earthwork.
- C. Granular Fill: Type A1 as specified in Section 31 05 16 – Aggregates for Earthwork.

## **PART 3 EXECUTION**

### **3.1 NOTIFICATION**

- A. Contractor, prior to any excavation work, shall notify (1) a designated locating service; (2) all utilities, governmental agencies, entities, known to, or which can reasonably be assumed to have above or below ground pipe, conduit cables, structures, or similar items within limits of project; to locate and mark location of such items.
- B. In accordance with Wisconsin Statute 182.0175, "Damage to Transmission Facilities," Excavator, as defined in 182.0175(1)(bm), shall be solely responsible to provide advance notice to "Diggers Hotline, Inc." (800-242-8511) not less than three working days prior to commencement of any Excavation, as defined in the statute, required to perform work contained in this Project, and further, Excavator shall comply with all other requirements of this Statute relative to Excavation.

### **3.2 EXAMINATION**

- A. Division 01 - Basic Requirements: Coordination: Verification of existing conditions before starting work.
- B. Verify project survey benchmarks and intended elevations are as indicated on Drawings.

### **3.3 PREPARATION**

- A. Identify required lines, levels, contours, and datum.
- B. Stake and flag locations of known utilities.
- C. Locate, identify, and protect utilities, indicated to remain, from damage.
- D. Notify utility company to remove and relocate utilities.
- E. Protect above and below grade utilities indicated to remain.
- F. Protect plant life, lawns, and other features remaining as portion of final landscaping.

- G. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

#### 3.4 TOPSOIL EXCAVATION

- A. Excavate topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.
- B. Do not excavate wet topsoil.
- C. Stockpile in area designated by Owner on site to depth not exceeding 8 feet and protect from erosion.
- D. Protect stockpiled material from erosion. Provide silt fencing or other approved erosion prevention method.
- E. Remove excess topsoil from site.
- F. Excess topsoil to be disposed off site shall become property of Contractor.

#### 3.5 SUBSOIL EXCAVATION

- A. Excavate subsoil from areas to be further excavated, re-landscaped, or re-graded.
- B. Do not excavate wet subsoil or excavate and process wet material to obtain optimum moisture content.
- C. Remove excess subsoil not intended for reuse, from site.
- D. Remove subsoil from site.
- E. Stability: Replace damaged or displaced subsoil as specified for fill.

#### 3.6 FILLING

- A. Install Work in accordance with Wisconsin Department of Transportation Standards.
- B. Fill areas to contours and elevations with unfrozen materials.
- C. Place fill material on continuous layers and compact.
- D. Maintain optimum moisture content of fill materials to attain required compaction density.
- E. Slope grade away from building minimum 2 inches in 10 feet, unless noted otherwise.
- F. Make grade changes gradual. Blend slope into level areas.
- G. Remove surplus fill materials from site.

3.7 TOLERANCES

- A. Top Surface of Subgrade: Plus or minus 1/10-foot from required elevation.

3.8 FIELD QUALITY CONTROL

- A. Division 01 - Basic Requirements: Quality Assurance / Quality Control of Installation: Testing and inspection services.
- B. Testing and Analysis of Fill Material: In accordance with ASTM D698.
- C. Density and Moisture Testing: In accordance with ASTM D6938.
- D. When tests indicate Work does not meet specified requirements, remove Work, replace, and retest.

3.9 SCHEDULES

- A. Granular Fill:
  - 1. Fill Type A1: Maximum 6-inch loose lifts.
  - 2. Compact each lift to minimum 95 percent of modified Proctor density.
- B. Subsoil Fill:
  - 1. Fill Type S1 or S2: Maximum 8-inch loose lifts.
  - 2. Compact each lift to minimum 90 percent of modified Proctor density.
- C. Topsoil Fill:
  - 1. Fill Type T1 or T2: Maximum 8-inch loose lifts.
  - 2. Compact each lift to minimum 80 percent of modified Proctor density.

**END OF SECTION**



## SECTION 31 23 17

### SITE EXCAVATION, BACKFILL, AND COMPACTION

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Section Includes:

1. Verification of subsurface conditions and utilities prior to excavation.
2. Saw cutting of pavements prior to excavation.
3. Excavation for structure foundation.
4. Excavation for slabs-on-grade.
5. Excavation of trenches for hydraulic system.
6. Excavation of trenches for electrical system.
7. Structure backfilling to subgrade elevations.
8. Backfill under slabs-on-grade.
9. Backfill requirements for utility trenches.
10. Backfill for over-excavation corrections.
11. Consolidation and compaction.

###### B. Related Sections:

1. Applicable provisions of Division 01 – Basic Requirements shall govern Work under this Section.
2. Section 31 05 16 – Aggregates for Earthwork: Aggregate backfill materials.
3. Section 31 22 13 - Rough Grading: Topsoil and subsoil removal from site surface.
4. Section 31 25 13 – Erosion Controls.
5. Section 32 01 00 – Site Restoration: Restoration of areas disturbed during construction activities.
6. Section 32 11 23 – Aggregate Base Course: Preparation for aggregate base course.

##### 1.2 REFERENCES

###### A. ASTM International (American Society for Testing and Materials)

1. ASTM C518 - Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
2. ASTM C578 – Specification for Rigid, Cellular Polystyrene Thermal Insulation.
3. ASTM D698 - Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort 12,400 ft.-lbf/ft<sup>3</sup>.
4. ASTM D1557 - Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort 56,000 ft.-lbf/ft<sup>3</sup>.
5. ASTM D1621 - Test Method for Compressive Properties of Rigid Cellular Plastics.
6. ASTM D2842 - Test Method for Water Absorption of Rigid Cellular Plastics.
7. ASTM D6938 – Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

- B. Erosion Control and Storm Water Management – Chapter 14 of Dane County Ordinances.
- C. State of Wisconsin Department of Transportation
  - 1. Standard Specifications for Highway and Structure Construction, Current Edition. (WISDOT)

### 1.3 REGULATORY REQUIREMENTS

- A. Contractor shall comply with all local, state, and federal regulations applicable to Work of this Section.
- B. Contractor shall comply with and be solely responsible for compliance with U.S. Department of Labor OSHA Part 1926 Safety and Health Regulations for Construction for this Work.
- C. Contractor performing Work of this Section shall be solely responsible for identifying, furnishing, installing and maintaining equipment and materials required by state and federal regulations to establish safe working conditions during Work of this Section.

## PART 2 PRODUCTS

### 2.1 BEDDING AND BACKFILL MATERIALS

- A. Pipe Bedding (18 Inches in Diameter and Less): Type A6, as defined in Section 31 05 16 – Aggregates for Earthwork.
- B. Crushed Stone Backfill: Type A1 as defined in Section 31 05 16 – Aggregates for Earthwork.
- C. Site Excavated Material (Spoil) Backfill: Type S1 as defined in Section 31 05 13 – Soils for Earthwork.

### 2.2 INSULATION

- A. Extruded polystyrene board to ASTM C578, Type V, rigid, closed cell type, with integral high density skin.
  - 1. Thermal Resistance: Typical 5 year aged value of R-5 per 1 inch of thickness per ASTM C518.
  - 2. Board Size: 24 x 96 x 2-inch thick. Square edges.
  - 3. Compressive Strength: Minimum 100 psi per ASTM D1621.
  - 4. Water Absorption: 0.7 percent by volume maximum per ASTM D2842.
- B. Insulation shall be Dow Chemical Company STYROFOAM™ Highload 100 or an approved equal.

## PART 3 EXECUTION

### 3.1 NOTIFICATION

- A. Contractor, prior to any excavation work, shall notify (1) a designated locating service; (2) all

utilities, governmental agencies, entities, known to, or which can reasonably be assumed to have above or below ground pipe, conduit cables, structures, or similar items within limits of project; to locate and mark location of such items.

- B. In accordance with Wisconsin Statute 182.0175, "Damage to Transmission Facilities," Excavator, as defined in 182.0175(1)(bm), shall be solely responsible to provide advance notice to "Diggers Hotline, Inc." (800-242-8511) not less than three working days prior to commencement of any Excavation, as defined in the statute, required to perform work contained in this Project, and further, Excavator shall comply with all other requirements of this Statute relative to Excavation.

### 3.2 SITE VERIFICATION

- A. Verify that survey benchmark and intended elevations for Work are as indicated.

### 3.3 FIELD MEASUREMENTS

- A. Verify that survey benchmark and intended elevations for the Work are as shown on Drawings.
- B. Contractor shall employ a Surveyor, registered in the State of Wisconsin to perform all survey work related to primary line and grade for project utilities or walks.
- C. Contractor shall check accuracy of line and grade stakes by means of visual and taping checks and shall be responsible for protection and preservation of such stakes established by Surveyor.
- D. Contractor shall bear sole responsibility for correct transfer of all construction lines and grades from primary line and grade points and for correct alignment and grade of finished structure, based upon primary line and grade established by Surveyor.
- E. Except for those lot corners and survey monuments that fall within trench excavation, Contractor shall be solely responsible for protection and/or replacement of all survey corners that exist throughout work area.
- F. A Registered Land Surveyor shall replace damaged corners at Contractor's expense.

### 3.4 SAWING AND BREAKING PAVEMENT

- A. Saw concrete pavement, slabs or bases to a minimum 1/2 of depth of existing pavement, slab, or base prior to removal.
- B. Saw cut asphalt surface full depth before removal.
- C. Cut pavements evenly along edges of excavation prior to their removal in such a way as to avoid excessive removal or ragged, uneven edges.

- D. A drop weight or other type of machinery for breaking pavement when approved by Engineer may be used when such usage does not become a nuisance or a source of damage to underground or adjacent structures.
- E. Prior to employing a drop weight, Contractor shall verify that there are no nearby underground structures that would be injured by its use.
- F. Contractor shall be solely responsible for any damage caused thereby.
- G. Engineer reserves right to order discontinuance of use of such drop weight at any time.

### 3.5 PREPARATION FOR EXCAVATION

- A. Identify required lines, levels, contours, and datum.
- B. Stake and flag locations of known utilities.
- C. Notify utility company to remove and relocate utilities that interfere with Work or are to be removed.
- D. Protect above and below grade utilities indicated to remain.
- E. Protect plant life, lawns and other features remaining as portion of final landscaping.
- F. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- G. Cut out soft areas of subgrade not capable of in situ compaction. Backfill with Type A6, as specified in Section 31 05 16 – Aggregates for Earthwork, fill and compact to density equal to or greater than requirements for subsequent backfill material.

### 3.6 FIELD QUALITY CONTROL FOR EXCAVATION

- A. Field inspection will be performed under provisions of Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation.
- B. Provide for visual inspection of bearing surfaces.

### 3.7 STRUCTURE EXCAVATION

- A. Underpin adjacent structures that may be damaged by excavation work, including utilities and pipe chases.
- B. Excavate subsoil required to accommodate slabs-on-grade and site structures.
- C. Machine slope banks to angle of repose or less, until shored.
- D. Excavation cut not to interfere with normal 45 degree bearing splay of foundation.

- E. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- F. Hand trim excavation. Remove loose matter.
- G. Remove lumped subsoil, boulders, and rock.
- H. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- I. Correct unauthorized excavation at no extra cost to Owner.
- J. Correct areas over-excavated in error.
- K. Stockpile excavated material in area designated on site and remove excess material not being reused, from site.

### 3.8 TRENCH EXCAVATION

- A. Excavate subsoil required for installation of utility.
- B. Provide pipe laid in open-cut trench with 4-inch minimum clearance between outside face of pipe barrel and face of sheathing or sidewall of trench.
- C. Maximum width of trench at ground surface shall not exceed width of trench at top of pipe by more than 2 feet.
- D. Place excavated material stored along trench excavation a minimum distance back from edge of trench. Determine distance by angle of repose of trench material to prevent surcharging of trench wall material leading to potential shearing of trench wall and collapse of trench.
- E. Store excavated material to be used for trench backfilling so that it will not interfere with other Contractors.
- F. Contractor shall immediately remove and dispose of excavated material which is not to be used as trench backfill, unless directed otherwise by Construction Documents.
- G. Contractor shall maintain all finished excavations free of water during Work.
- H. Hand trim excavation. Remove loose matter.
- I. Remove lumped subsoil, boulders, and rock.
- J. Correct unauthorized excavation and over-excavated areas at no cost to Owner.
- K. Excavate no more trench in advance of completed pipe laying operations than can be completed and backfilled by end of workday.

### 3.9 TRENCH BEDDING

- A. Keep trench bottom free of water prior to placement of bedding and laying of utility.
- B. Place and shape bedding material to pipe, to a minimum depth of three inches under utility and compact to 95 percent modified Proctor density.
- C. Bring bedding and cover material over top of pipe to a minimum compacted depth of 6 inches, compact to specified density.
- D. Where sand is used for cover material, compact sand with portable plate compactor to a depth of twelve inches in two lifts of six inches each for initial cover over pipe.

### 3.10 INSULATION

- A. Insulate slab edges with less than 6 foot of cover with a minimum of one 2-inch thick sheet of extruded polystyrene insulation.
- B. Extend insulation a minimum full height of slab edge.

### 3.11 PROTECTION

- A. Protect excavations by methods required to prevent cave-in or loose soil from falling into excavation.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

### 3.12 EXAMINATION PRIOR TO BACKFILLING

- A. Verify fill material to be reused are acceptable.
- B. Verify foundation perimeter drainage installation has been inspected.

### 3.13 BACKFILLING

- A. Backfill with materials and to contours and elevations shown on Drawings. Generally, compact subgrade to density requirements for subsequent backfill materials.
- B. Place specified backfill in loose lift layers. Use compaction equipment that will achieve desired compaction requirements.
- C. Systematically backfill to allow for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- D. Where sidewall material is loose or unstable, place geotextile cloth material over sidewall prior to backfilling.
- E. Employ a placement method that does not disturb or damage pipe in trench.

- F. Maintain optimum moisture content of backfill materials to attain required compaction density.
- G. Slope grade away from building minimum 2 inches in 10 feet, unless noted otherwise.
- H. Make grade changes gradual. Blend slope into level areas.
- I. Leave fill material stockpile areas completely free of excess fill materials.
- J. Remove surplus backfill materials from site.

### 3.14 MECHANICAL COMPACTION

- A. Mechanically compact backfill by means of a tamping roller, pneumatic tire roller, vibrating roller, or other mechanical tampers. Impact, free-fall, or "stomping" type compaction equipment shall not be allowed.
- B. Flooding or jetting of backfill for compaction purposes shall not be allowed.
- C. Place material for mechanically compacted backfill in lifts, which, prior to compaction, shall not exceed thickness specified below for type of compaction equipment used:
  1. Vibratory equipment including vibratory plate, vibratory smooth-wheel rollers, and vibratory pneumatic-tired rollers: maximum lift thickness two (2) feet.
  2. Rolling equipment, grid, smooth-wheel (non-vibratory), pneumatic-tired (non-vibratory), and segmented wheels: maximum lift thickness one (1) foot.
  3. Hand-directed mechanical tampers: maximum lift thickness of six (6) inches.

### 3.15 TOLERANCES FOR BACKFILL

- A. Top Surface of Backfill: Plus or minus 1 inch from required elevations.

### 3.16 COMPACTION REQUIREMENTS

- A. Granular Material shall be compacted to 95 percent of modified Proctor density.
- B. Excavated Material to be used for backfill shall be compacted to a density equal to adjacent undisturbed trench wall or as specified.

### 3.17 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation.
- B. Testing and analysis of fill material will be performed in accordance with ASTM D698 or D1557 and Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation..

- C. Compaction and moisture testing will be performed in accordance with ASTM D6938 and Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation.
- D. If tests indicate Work does not meet specified requirements, remove Work, replace, and retest at no cost to Owner.

### 3.18 PROTECTION OF FINISHED WORK

- A. Reshape and recompact fills subjected to vehicular traffic.

### 3.19 SCHEDULE OF BACKFILL

- A. Section 31 05 16 – Aggregates for Earthwork defines “A” designated fill materials and Section 31 05 13 – Soils for Earthwork defines “S” designated fill materials.
- B. Fill to Correct Over-Excavation:
  - 1. Lean concrete to minimum compressive strength of 500 psi.
- C. Foundations:
  - 1. Aggregate Type A1 fill. Place materials in continuous loose lifts layers not exceeding 7-inch depth, compacted to 95 percent modified Proctor density.
- D. Exterior Slab-On-Grade:
  - 1. Aggregate Type A1 fill. Place materials in continuous loose lifts layers not exceeding 7-inch depth, compacted to 95 percent modified Proctor density.
- E. Utility Piping - Sand Bedding and Cover:
  - 1. Aggregate Type A11 fill. Place materials in continuous loose lifts layers not exceeding 6-inch depth, compacted to 95 percent modified Proctor density.
- F. Utility Trench – Backfill in Non-paved Areas:
  - 1. Subsoil Type S1 fill, to 4 inches below finish grade. Place materials in continuous loose lifts layers not exceeding 12-inch depth, compacted to 90 percent modified Proctor density.
- G. Fill Under Grass Area.
  - 1. Subsoil Type S1 or S2 fill, to 4 inches below finish grade. Place materials in continuous loose lifts layers not exceeding 8-inch depth, compacted to 90 percent modified Proctor density.

**END OF SECTION**



**SECTION 31 25 13**  
**EROSION CONTROLS**

**PART 1 GENERAL**

1.1 SUMMARY

- A. Section Includes:
1. Equipment and materials for erosion and sediment control to minimize erosion and siltation during construction.
  2. Erosion and sediment control provisions detailed on Drawings and specified herein are minimum requirements for erosion control program.
  3. Contractor to provide additional erosion and sediment control materials and methods required by state or local ordinances, whichever is more stringent.
- B. Related Sections:
1. Applicable provisions of Division 01 - Basic Requirements shall govern Work under this Section.
  2. Section 31 05 13 – Soils for Earthwork: Existing topsoil and subsoil.
  3. Section 31 05 16 – Aggregates for Earthwork: Drainage stone.
  4. Section 31 22 13 - Rough Grading: Rough grading and contouring of project site including stripping of existing site soils.
  5. Section 31 23 17 – Site Excavation, Backfill, and Compaction.
  6. Section 31 37 00 – Riprap and Rock Lining.
  7. Section 32 01 00 – Site Restoration: Seeding, sodding, and plantings.

1.2 REFERENCES

- A. ASTM International (American Society for Testing and Materials)
1. ASTM D3786 – Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method.
  2. ASTM D4355 – Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus.
  3. ASTM D4491 – Test Methods for Water Permeability of Geotextiles by Permittivity.
  4. ASTM D4533 – Test Method for Trapezoid Tearing Strength of Geotextiles.
  5. ASTM D4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles.
  6. ASTM D4751 - Test Method for Determining Apparent Opening Size of a Geotextile.
  7. ASTM D4833 - Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.
- B. Erosion Control and Storm Water Management – Chapter 14 of Dane County Ordinances.
- C. State of Wisconsin Department of Natural Resources (WDNR)
1. Construction Site Erosion & Sediment Control.  
<http://www.dnr.state.wi.us/runoff/stormwater/techstds.htm>

- D. State of Wisconsin Department of Transportation
  - 1. Standard Specifications for Highway and Structure Construction, Current Edition. (WISDOT).
  - 2. Erosion Control Product Acceptability Lists for Multi-Modal Applications. (PAL)

### 1.3 REGULATORY REQUIREMENTS

- A. Comply with WDNR and Dane County Ordinance for construction site erosion control.
- B. Comply with applicable state and federal rules and regulations governing erosion and siltation on construction sites.
- C. Permit
  - 1. Apply for, pay fee, and obtain State stormwater discharge permit.
  - 2. Prepare construction site erosion control plan, Consolidated Permit form, and submit form and current fee to Wisconsin Department of Natural Resources at least 14 working days prior to commencing land disturbing construction activities.
  - 3. At completion of construction activity, file Notice of Termination.

### 1.4 EROSION CONTROL PRINCIPLES

- A. Keep disturbed area small.
- B. Stabilize disturbed areas with mechanical or structural and vegetative methods.
- C. Keep runoff low through use of short slopes, low gradients, and preservation of natural vegetative cover.
- D. Protect disturbed areas from storm water runoff.
- E. Retain sediment within site boundaries.
- F. Implement a thorough maintenance and follow-up program.

## **PART 2 PRODUCTS**

### 2.1 MATERIALS

- A. Sand Bags:
  - 1. Sandbag shall be woven polypropylene, polyethylene, or polyamide fabric, with minimum unit weight 4 oz/sq.yd., Mullen burst strength exceeding 300 psi in conformance with requirements in ASTM D3786, and ultraviolet stability exceeding 70 percent in conformance with requirements in ASTM D4355. Use of burlap is not acceptable.
  - 2. Each sand-filled bag shall have a length of 18 inches, width of 12 inches, thickness of 3 inches, and a mass of approximately 35 lb. Bag dimensions are nominal, and may vary based on locally available materials.

3. Sandbag fill material shall be non-cohesive, permeable material free from clay and deleterious materials. Fill bag approximately half full.

**B. Soil Bags**

1. Bags shall be polypropylene, staple fiber, needle-punched non-woven geotextile of 50-mil thickness. Needle fibers to form a stable network that retains dimensional stability relative to each other. Geotextile shall be resistant to ultraviolet degradation and to biological and chemical environments not normally found in soils.
2. Geotextile shall have the following minimum properties:

Property	Test	Value
Grab Tensile Strength	ASTM D4632	115 lbs
Puncture Strength	ASTM D4833	65 lbs
Mullen Burst	ASTM D3786	210 psi
Trapezoidal Tear	ASTM D4533	50 lbs
Apparent Opening Size	ASTM D4751	70 US Sieve
Water Flow Rate	ASTM D4491	140 gpm

3. Soil bags shall have a filled volume greater than 1 cubic foot and shall be furnished with a tie and a connecting spike
4. Soil bags shall be similar and equal to Envirolok™ as manufactured by Agrecol Corporation or an approved equal.

**C. Erosion Bales:** Tightly compacted bales of grain straw, hay, or other suitable material with approximate dimensions of 14 inches high, 18 inches deep, and 36 inches long, secured by a minimum of two strings.

**D. Silt Fence:**

1. Geotextile Fabric: Textile shall be polyethylene fabric with properties as follows:

<u>Property</u>	<u>Test Method</u>	<u>Value</u>
Grab Tensile Strength	ASTM D4632	120 lb. minimum
Elongation	ASTM D4632	15% x 15% maximum
Mullen Burst Strength	ASTM D3786	260 psi minimum
Puncture	ASTM D4833	60 lb minimum
Trapezoidal Tear	ASTM D4833	60 lb minimum
Apparent Size Opening	ASTM D4751	U.S. 30 sieve
Water Flow Rate	ASTM D4491	10 gal/min/sq.ft. maximum
Ultra violet radiation stability	ASTM D4355	70 percent minimum

2. Fabric with support netting shall be reinforced with an industrial polypropylene netting with 3/4-inch spacing and heavy-duty nylon top support cord or equivalent.
3. Support Posts: Wood or steel construction, minimum length 5 feet, supply staple, cord or other suitable means to attach geotextile to support posts.

E. Riprap and Breaker Run Stone: Riprap and breaker run stone shall conform to the following classifications:

1. Heavy Riprap Rock:

<u>Given Size</u>	<u>Percent Total Weight of Smaller Size Stones</u>
500 lbs.	100
400 lbs.	90
150 lbs.	50
40 lbs.	20

2. Light Riprap Rock:

<u>Given Size</u>	<u>Percent Total Weight of Smaller Size Stones</u>
150 lbs.	100
60 lbs.	80
20 lbs.	20
2 lbs.	10

3. Breaker Run Rock or 6-inch Crushed Rock:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
7-inch	100
6-inch	90
4-inch	75
3-inch	10

F. Construction Entrance:

- Aggregate: Type A14 – Granular Fill as specified in Section 31 05 16 – Aggregates for Earthworks, minimum 12 inches thick, compacted
- Geotextile: Woven polypropylene, TenCate Geosynthetics North America Mirafi 600X or approved equal.

G. Erosion Mats and Blankets

- Only mats listed in WISDOT PAL will be accepted for use. Use Class I, short-term duration, light duty, organic erosion control mats with biodegradable netting, Type A, suitable for slope application materials. Plastic netting is not allowed.
- Select erosion mats that last long enough for grass or other vegetation to become densely established.
- Documentation of materials used, monitoring logs, project diary, and weekly inspection forms including erosion and stormwater management plans, should be submitted to Owner's Representative.

4. Use U-shaped wire staples, metal pins or wooden stakes to anchor mats and blankets to ground surface. Staples shall be made of 0.12 inch steel wire and shall be U-shaped with 8-inch legs and 2-inch crown. Wire staples shall be minimum of 11 gauge. Metal stake pins shall be 0.188-inch diameter steel with a 1.5 inch steel washer at head of pin. Staples or stakes shall be driven flush to soil surface. Anchors shall have sufficient ground penetration to resist pullout by wind. Loose soils may require longer anchors.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION**

#### **A. Sand Bags**

1. Install along a level contour. Turn ends of sandbag row up slope to prevent flow around ends.
2. Stack sandbags to required height using a pyramid approach. Upper rows of sandbags shall overlap joints in lower rows.
3. Construct sandbag barriers with a setback of at least 3 feet from toe of slope. Where it is determined to be not practicable due to specific site conditions, sandbag barrier may be constructed at toe of slope, but shall be constructed as far from toe of slope as practicable.

#### **B. Soil Bags**

1. Stack soil bags to create wall. Extend wall to one bag above design flow depth. Anchor bags together with spikes.
2. Plant two shrub cuttings in each soil bag and apply soil bag seed at rates of 10 lbs/acre for grasses, 3 lbs/acre for forbs, and 10 lbs/acre for cover crop.
3. Install seed as a 50/50 blend with bonded-fiber matrix filler.

#### **C. Erosion Bales Fencing**

1. Place bales end to end across ditches or other location as designated on Drawings.
2. Place bales at right angles to direction of water flow with bandings oriented around sides.
3. Tightly abut ends of bales and fill gaps between bales with bale material wedged in.
4. Embed straw bales a minimum 4 inches into ground.
5. Securely anchor bales with at least two wood or steel stakes driven a minimum 8 inches into ground.

#### **D. Catch Basin and Inlet Protection on Soil**

1. Install inlet barrier, a combination of filter fabric fencing and bale fencing, around entire perimeter of inlet.
2. Install filter fabric fence as specified below except posts shall have a maximum spacing of 4 feet.
3. Install bale fence on exterior of filter fence as specified in this Section.

#### **E. Catch Basin and Inlet Protection on Paved Area**

1. Remove inlet grate from basin.

2. Place filter fabric over inlet opening and push down in center to form a basket.
  3. Install fabric such that it extends minimum 12 inches beyond inlet casting edges.
  4. Re-install inlet grate to hold filter fabric in place.
  5. Verify that fabric is retained in place by grate.
  6. Place bales around perimeter of inlet and secure with a minimum of two perimeter rope or cable restraints.
- F. Filter Fabric Fencing
1. Install filter fence to maximum height of 24 inches.
  2. Install support posts on downstream side of fencing to depth that is adequate to insure stability of fence and at maximum spacing of 8 feet.
  3. Excavate 4-inch by 4-inch trench up-slope along line of support posts to anchor fabric.
  4. Staple filter material to up-slope side of posts and extend fabric into trench.
  5. Backfill and compact filter fabric in trench.
  6. Provide silt fence surrounding existing catch and inlet basins affected by site work.
- G. Riprap
1. Furnish and install riprap to thickness and area necessary to prevent erosion and control sedimentation.
  2. Conform to requirements of Section 31 37 00 – Riprap and Rock Lining.
- H. Construction Entrance
1. Grade area minimum of 50 feet long and 20 feet wide with slope into construction site.
  2. Install geotextile fabric over entire area of entrance.
  3. Place aggregate to a minimum depth of 12 inches.
- I. Mulch
1. Install mulch within seven days of active disturbance of soil surface.
  2. Area to be mulched shall be reasonably free of sticks, stones larger than 3 inches in diameter, and rills and gullies.
  3. Apply mulch at following rates:
    - a. Straw: 70-90 pounds per 1,000 sq. ft.
    - b. Wood Chips: 275-425 pounds per 1,000 sq. ft.
    - c. Wood Fiber: 35-50 pounds per 1,000 sq. ft.
  4. Anchor mulch by one of following methods at time of spreading or immediately after spreading.
    - a. Punch mulch into soil with weighted disc of similar implement to a depth of 2 inches.
    - b. Apply synthetic materials in accordance with manufacturer's instructions.
- J. Erosion Mats and Blankets
1. Install erosion mats and blankets in accordance with manufacturer's instructions.
  2. Begin at top of slope and anchor mat or blanket in a 12-inch deep trench. Backfill trench, tamp earth firmly, and anchor every 12 inches. Unroll material downslope in direction of water flow.

3. Overlap edges of adjacent parallel rolls 4 inches and anchor every 12 inches. When rolls must be spliced, place ends in common trench as described above with 6-inch overlap. Anchor through overlapped area, approximately 6 inches apart.
4. Lay material loosely and maintain direct contact with soil. Do not stretch.
5. Staple or stake material sufficiently to anchor blanket and maintain contact with soil.
6. Place anchors down center and stagger with anchors placed along edges.
7. Staple or Stake Spacing
  - a. Steep Slopes, 1V:1H to 1V:2H: Minimum of 2 per square yard.
  - b. Moderate Slopes, 1V:2H to 1V:3H: minimum of 1-1/2 per square yard, placing 1 per yard on centers.
  - c. Gentle Slopes: Minimum of 1 per square yard.

### 3.2 MAINTENANCE

- A. Inspect erosion control devices within 24 hours after each rainfall or daily during periods of prolonged rainfall.
- B. Repair or replace damaged or defective materials or installation immediately.
- C. Remove sediment deposits within 24 hours after each storm event or when deposits reach one-half height of fence or barrier, whichever occurs first.
- D. Apply replacement bales or additional mulch, netting, or matting immediately to maintain suitable cover.
- E. Where vegetative cover has been placed, inspect until vegetative cover is established and functioning as intended.

### 3.3 REMOVAL OF EROSION CONTROL DEVICES

- A. Maintain erosion control measures disturbed earth has been paved or vegetated.
- B. Remove erosion control devices prior to final inspection and acceptance of Project site by Owner.
- C. Restore or replace areas disturbed or damaged by removal of erosion control devices to satisfaction of Engineer and Owner's Representative.

**END OF SECTION**

## SECTION 31 37 00

### RIPRAP AND ROCK LINING

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Riprap.
  - 2. Rock lining.
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern Work under this Section.

##### 1.2 REFERENCES

- A. State of Wisconsin Department of Transportation.
  - 1. Standard Specifications for Highway and Structure Construction, Current Edition, including latest supplements. (WISDOT)
- B. Erosion Control and Storm Water Management – Chapter 14 of Dane County Ordinances.

##### 1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with State of Wisconsin Department of Transportation Standards and Dane County Ordinances.

#### PART 2 PRODUCTS

##### 2.1 MATERIALS

- A. Furnish materials in accordance with State of Wisconsin Department of Transportation Standards.
- B. Riprap: Limestone type; broken stone, irregular shaped rock; solid and nonfriable; 12 inch minimum size, 24 inch maximum size.
- C. Geotextile Fabric: Non-biodegradable, nonwoven fabric made from 100 percent polypropylene staple filaments.
  - 1. Manufacturers:
    - a. Carthage Mills – Series: FX-80HS.
    - b. TenCate Geosynthetics: North America Mirafi - Series 180N.
    - c. Propex Inc. - Series 801.
    - d. US Fabrics, Inc. - Series 205NW.
    - e. Substitutions: In accordance with Division 01 – Basic Requirements: Substitutions.



2.2 CLASSIFICATION

A. Heavy Riprap Rock:

Size (Pounds)	Percent Smaller (by weight)
500	100
400	90
150	50
40	20

B. Light Riprap Rock:

Size (Pounds)	Percent Smaller (by weight)
150	100
60	80
20	20
2	10

C. Breaker Run Rock or 6-inch Crushed Rock:

Sieve	Percent Smaller
7-inch	100
6-inch	90
4-inch	75
3-inch	10

**PART 3 EXECUTION**

3.1 EXAMINATION

- A. Division 01 – Basic Requirements: Coordination.
- B. Do not place riprap over frozen or spongy subgrade surfaces.

3.2 PLACEMENT

- A. Place geotextile fabric over substrate, lap edges and ends.
- B. Place riprap at front of dam apron, lock area, and along lock wall.
- C. Place riprap into position.
- D. Knead and compact riprap to contour of adjacent material and other riprap previously placed.
- E. Place riprap in staggered pattern. Remove foreign matter from surfaces.

- F. Installed Thickness: Minimum 24 inch average.
- G. Place rock evenly and carefully over bagged riprap to minimize voids, do not tear geotextile fabric, place rock in one consistent operation to preclude disturbance or displacement of substrate.

**END OF SECTION**

## SECTION 31 52 00

### COFFERDAMS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Contractor designed and supplied cofferdams.
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.

##### 1.2 SYSTEM DESCRIPTION

- A. Contractor shall design, install, and remove cofferdams as required to make concrete repairs and modifications.
- B. Original drawings indicate existing riprap placed 3 feet in front and 5 feet behind LaFollette Dam.
- C. Cofferdams shown on Construction Drawings are conceptual. Contractor is responsible for layout design, installation, and removal of cofferdams.

##### 1.3 EXISTING CONDITIONS – LAFOLLETTE DAM

- A. A minimum flow of 15 cfs is required. Typical flows are 300 to 500 cfs.
- B. Expected peak discharges of 652 cfs are expected after a 10 year storm (.10 percent occurrence probability) with a water surface elevation of 844.5.
- C. Expected peak discharges of 978 cfs are expected after a 100 year storm event (2 percent occurrence probability) with a water surface elevation of 845.0.

##### 1.4 EXISTING CONDITIONS – BABCOCK DAM

- A. A minimum flow of 15 cfs is required. Typical flows are 300 to 500 cfs.
- B. Expected peak discharges of 731 cfs are expected after a 10 year storm (.10 percent occurrence probability) with a water surface elevation of 845.8.
- C. Expected peak discharges of 1,073 cfs are expected after a 100 year storm event (2 percent occurrence probability) with a water surface elevation of 846.8.

## 1.5 SUBMITTALS

- A. Contractor shall submit construction sequence plan indicating cofferdam methods to be employed.
- B. Contractor shall submit plans and sections sealed by a Design Professional registered in the State of Wisconsin.

## 1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum five years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum five years documented experience and approved by liner manufacturer.

## 1.7 PRE-CONSTRUCTION MEETINGS

- A. Convene minimum one week prior to commencing work of this Section.

## 1.8 DELIVERY, STORAGE AND HANDLING

- A. Division 01 – Basic Requirements: Transporting, Handling, Storage, and Protection.
- B. Store products to protect from damage.
- C. Pick-up and return Owner's cofferdams, if used, as directed by Owner.

## 1.9 FIELD MEASUREMENTS

- A. Verify field measurements required prior to fabrication.

## **PART 2 PRODUCTS**

Not Used

## **PART 3 EXECUTION**

### 3.1 COFFERDAM CONSTRUCTION

- A. Construct cofferdam to maintain a minimum of 1/2 of dam and lock width area during all construction operations.
- B. Remove cofferdams within 48 hours of notification by Engineer when high flows are expected.

**END OF SECTION**

## SECTION 32 01 00

### SITE RESTORATION

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Work necessary to restore to its original or specified condition following items, either removed to facilitate construction or damaged during Work. Restoration of:
    - a. Asphalt pavement, curb and sidewalks.
    - b. Public lawn areas.
    - c. Existing trees, bushes, and shrubs.
    - d. Miscellaneous landscape and shoreline.
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern Work under this Section.
  - 2. Section 31 05 16 – Aggregates for Earthwork.
  - 3. Section 32 12 16 – Asphalt Paving.

##### 1.2 REFERENCES

- A. State of Wisconsin, Department of Transportation
  - 1. Standard Specification for Highway and Structure Construction, Current Edition. (WISDOT)
- B. Turf Producers International (TPI)
  - 1. Guideline Specifications To Turfgrass Sodding.

##### 1.3 TESTS

- A. Testing and analysis of restoration materials will be performed under provisions of Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation.

#### PART 2 PRODUCTS

##### 2.1 AGGREGATE BASE COURSE

- A. As specified in Section 32 11 23 – Aggregate Base Course.

##### 2.2 ASPHALT MIX

- A. Asphalt mix as specified in Section 32 13 16 – Asphalt Paving.

## 2.3 TOPSOIL

- A. Imported, black dirt type friable loam; free of subsoil, stones, roots, grass, excessive amount of weeds, and foreign matter; acidity range (pH) of 5.5 to 7.5; containing an minimum of 25 percent of organic matter.
- B. Mix soil amendments to achieve desired pH as follows: 4 parts topsoil, 1 part humus, and 1 pound of bone meal per cubic yard of topsoil.
- C. Salvaged topsoil may be used with approval of Engineer or Owner's Representative and shall consist of natural loam, fertile, humus bearing soils overlying subsoil in area.

## 2.4 GRASS SEED - LAWNS

- A. Seed mixture No. 40 as specified in WISDOT Section 630, Kentucky Bluegrass.

## 2.5 GRASS-SEED - RIGHT OF WAY EXCLUDING LAWNS

- A. Seed mixture No. 10 or 20 as specified in WISDOT Section 630.

## 2.6 SOD

- A. Field grown; cultivated grass sod, type as indicated below; with strong fibrous root system, free of stones and burned or bare spots; undesirable grasses, and containing no more than 5 weeds per 1000 square feet.
  - 1. Sod shall be composed of following percentages of plants:
    - a. Forty percent Bluegrasses (*Poa pratensis*).
    - b. Forty percent Fescue Grasses (*Festuca rubra*).
    - c. Twenty percent Rye Grasses (*Lolium perenne*).
  - 2. Sod shall be minimum age of 18 months, with root development that will support its own weight, without tearing, when suspended vertically by holding upper two corners.
  - 3. Roll machine-cut sod shall be rolled in accordance with TPI guidelines, in running bond pattern.
  - 4. Cut sod in area not exceeding one square yard with a uniform minimum 1-inch topsoil base.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. Replace paved surfaces, curbs and gutters, sidewalks, driveways and driveway approaches, lawns, trees, shrubs, and other surface features disturbed or damaged during Work as specified herein or as called for on Drawings.

- B. Provide protective covers or coatings for any exposed portions of bridges, culverts, curb and gutter, manholes, valve boxes, fences, signs or other public or private structures that may be splashed, stained or damaged by restoration activities especially during asphalt or concrete restoration work.
- C. Remove any oil, asphalt, concrete, dirt or other undesirable matter that may come in contact with these structures.
- D. Compaction of Subgrade: Prior to restoration work contained in this Section, Contractor shall verify that backfilling and compaction has been completed and excavations and areas disturbed by Work brought up to finished subgrade elevation in accordance with requirements contained in this Project Manual.
- E. Settlement or other failure of restoration work will require its removal, rework of subgrade and application of new restoration materials.
- F. Contractor shall be responsible for maintenance, repair, protection and safety of disturbed areas prior to its restoration.
- G. Contractor shall provide as part of its project cost crushed stone, gravel, asphalt patching material or other temporary materials required to keep disturbed areas in a condition for use they were intended.
- H. Contractor shall maintain disturbed areas on a continuous basis from time work if it initiated until restoration is completed including but not limited to maintenance of grade, elevations, crowns, compaction, dust elimination and drainage.
- I. Contractor shall immediately respond to requests from Owner or Engineer relative to received complaints of unsatisfactory conditions.

### 3.2 AGGREGATE BASE COURSE INSTALLATION

- A. Spread aggregate over existing substrate to a total compacted thickness of 3/4 inches or as indicated on Drawings.
- B. Place aggregate in maximum 7-inch loose lifts and compact to specified density.
- C. Level and contour surfaces to elevations and gradients indicated.
- D. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.
- E. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
- F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

### 3.3 ASPHALT RESTORATION - PAVEMENT, CURBS, SIDEWALKS

- A. Repair damage to asphalt paved areas per Section 32 12 16 – Asphalt Paving or as required to match damaged area.

### 3.4 GRAVEL/STONE RESTORATION

- A. Contractor shall place crushed road gravel or crushed stone of size and type used in existing road shoulder, driveway, parking or walking surface.
- B. Remove excavated materials and existing materials contaminated with excavated material from area to be restored.
- C. Place new gravel or stone material to match existing thickness and grade of adjacent undisturbed area, compact, and restore area to its existing condition.
- D. Spread and compact aggregate in compacted layers of 6 inches or less.
- E. Compact aggregate until there is no appreciable displacement, either laterally or longitudinally, under compaction equipment. Route hauling equipment uniformly over previously placed base. Compact each layer before placing a subsequent layer. If material is too dry to readily attain required compaction, add water as necessary to achieve compaction.

### 3.5 DRAINAGE FACILITIES

- A. Contractor shall maintain ditches and drainage facilities during Work. Upon completion of Work, restore to original condition.
- B. Replace materials damaged during construction in kind as approved by Engineer.
- C. Contractor shall immediately notify Engineer or Owner's Representative if it encounters materials that are in poor condition due to deterioration or failure for direction on replacement.
- D. Contractor shall assume responsibility to replace materials at their cost if notification is not given to Engineer or Owner's Representative prior to removal.
- E. Replace existing piping damaged or disturbed during construction activities by installing new pipe to existing line and grade. Install pipe on 4 inches of bedding material.
- F. Install other utility appurtenances in accordance with requirements contained in other Sections of this Project Manual.
- G. Where no information as to installation is contained in Project Manual, contact Engineer for direction before proceeding.
- H. If Contractor encounters underground piping that appears to be abandoned, Contractor shall



notify both Owner and Engineer to verify that pipe is in fact abandoned and need not be replaced or repaired.

### 3.6 LAWN REPLACEMENT

- A. Replace lawn areas to match existing unless directed otherwise on Drawings or required by easement or right-of-way permit.
- B. Eliminate uneven areas and low spots. Remove debris, roots, branches, and stones in excess of 1/2-inch size. Remove subsoil contaminated with petroleum products.
- C. Place 4 inches of topsoil over area to receive sod and to a depth of 4 inches in areas to be seeded.
- D. Place topsoil during dry weather and on dry, unfrozen subgrade.
- E. Sod Placement:
  - 1. Moisten prepared topsoil surface immediately prior to laying sod.
  - 2. Lay sod immediately upon delivery to site to prevent deterioration.
  - 3. Contractor shall immediately remove from site any dried, torn, dormant, coarse-bladed, or otherwise objectionable sod rolls.
  - 4. Undertake extra care when sodding operations are required beyond recommended schedule of implementation. Under no circumstances shall sod be laid on frozen ground.
  - 5. Lay sod to form a solid mass with tightly fitted joints.
  - 6. Compress butt ends and sides of sod strips to reduce shrinkage. Stagger sod strips to offset joints in adjacent courses and tamp lightly to ensure contact with subgrade.
  - 7. When sodding throughout areas whose gradient exceeds 1 vertical foot for each 4 horizontal feet, Contractor shall anchor sod strips with 10-inch staples to prevent slippage.
  - 8. Provide quality sod lawn whose grasses have been blended within rates specified earlier within this Section.
  - 9. Water sod thoroughly with a fine spray immediately after planting. Saturate existing soils to a depth of 4 inches.
- F. Seed Placement
  - 1. Apply seed at a rate of 7 pounds per 1000 square feet evenly in 2 intersecting directions. Rake in lightly. Do not seed area in excess of that which can be mulched on same day.
  - 2. Do not sow immediately following rain, when ground is too dry, or during windy periods.
  - 3. Roll seeded area with a light roller.
  - 4. Immediately following seeding and rolling, apply mulch to 1/8-inch thickness. Maintain clear of shrubs and trees.
  - 5. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

6. Identify seeded areas with stakes and string around area periphery. Set string height to 12 inches.
7. Cover seeded slopes where grade is 4 inches per foot or greater with erosion fabric.
  - a. Roll fabric onto slope without stretching or pulling.
  - b. Secure outside edges and overlaps at 36-inch intervals with stakes.
  - c. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches.
8. Maintain seeded area until growth is assured including watering, control of weed growth, replacement of areas that show bare spots, and protection of area.

### 3.7 TREES, SHRUBS, BUSHES

- A. Contractor, at its expense, shall maintain any tree, shrub, or bush within construction or easement limits designated to remain.
- B. Contractor shall not store excavated material or backfill materials on root system of trees.
- C. If Contractor finds it necessary to remove or relocate a tree, bush, or shrub designated to remain, remove and replant within 24 hours of removal.
- D. If designated tree, bush, or shrub does not survive transplant Contractor shall replace with in kind plant material at its expense.
- E. Do not remove, cut back, or trim trees, shrubs, or bushes unless specifically allowed in Construction Documents or with prior written approval of owner of easement or right-of-way with a copy of such written approval furnished to Engineer or Owner's Representative prior to commencing work.
- F. Neatly cut roots 1-inch or larger in diameter perpendicular to direction of growth.
- G. Neatly cut branches perpendicular to direction of growth at main limb or trunk.
- H. When Contractor replaces trees, shrubs, or bushes, perform planting during normal Spring and Fall planting seasons and as conditions permit planting. Do not install plant material when ground is frozen.
- I. Contractor shall vertically brace plants with protection wrapped guy wires and stakes as follows:
  1. Provide one stake and tie for plant up to 1- inch diameter.
  2. Provide two stakes and ties for plants up to 2 inches in diameter.
  3. Provide three guy wires with eyebolts and turnbuckles for plants over 2 inches in diameter.
- J. Contractor shall maintain plants from time of planting for 30 days. Maintenance includes watering, spraying, cultivating, weeding, fertilizing, and cutting and pruning to maintain plants in a healthy condition.

3.8 PROTECTION AND RESTORATION OF PROPERTY

- A. Contractor shall use every reasonable precaution to prevent damage to or destruction of public or private property such as, but not limited to, poles, mailboxes, fences, agricultural crops adjacent to or interfering with the Work; overhead structures such as wires and cables; and underground structures such as water and gas mains, pipes, conduits, and shutoff boxes, within or without construction limits.

3.9 RESTORATION OF GRADES AND ELEVATIONS

- A. Contractor shall restore grade and radiuses of ditches and culverts encountered during the Work to original unless directed otherwise by Construction Documents.
- B. Contractor shall re-establish grade and elevations of property disturbed by the Work to original condition unless directed otherwise by Drawings.
- C. Contractor shall protect and preserve property and survey marks and monuments and shall notify Engineer and Owner's Representative of location of these markers as discovered. Do not disturb or destroy these markers.
- D. Contractor shall bear costs of replace or restoration of survey markers or monuments destroyed or disturbed during course of its work.

3.10 EXCESS MATERIAL

- A. Contractor shall remove and dispose of excess materials produced as a result of restoration work of this Section.
- B. Perform disposal of excess and removed material in accordance with local, state, or federal regulations.
- C. Burning and on site disposal are not allowed.

3.11 GUARANTEE

- A. Contractor shall guarantee restoration work against defective workmanship, materials, or labor for a period of one year from date of final completion as established by the General Conditions.

**END OF SECTION**

## SECTION 32 11 23

### AGGREGATE BASE COURSE

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Aggregate Materials.
  - 2. Sub-grade Preparation.
  - 3. Test Rolling Equipment and Procedures.
  - 4. Aggregate Installation Requirements.
  - 5. Aggregate Shoulder.
  - 6. Base Course Schedule.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern Work under this Section.
  - 2. Section 31 05 16 – Aggregates for Earthwork.
  - 3. Section 31 22 13 - Rough Grading: Preparation of site for base course.
  - 4. Section 32 01 00 – Site Restoration: Restoration of site adjacent to walkways.
  - 5. Section 32 12 16 – Asphalt Paving: Surface asphalt courses.

##### 1.2 REFERENCES

- A. State of Wisconsin Department of Transportation
  - 1. Standard Specifications for Highway and Structure Construction, Current Edition. (WISDOT)
  
- B. ASTM International (American Society for Testing and Materials)
  - 1. ASTM D698 – Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort 12,400 ft.-lbf/ft<sup>3</sup>.
  - 2. ASTM D1557 – Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort 56,000 ft.-lbf/ft<sup>3</sup>.
  - 3. ASTM D6938 – Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

#### PART 2 PRODUCTS

##### 2.1 AGGREGATE MATERIALS

- A. Aggregate Material: Type A1 as specified in Section 31 05 16 – Aggregates for Earthwork.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify substrate is dry and has been inspected, and gradient and elevation are correct.

### **3.2 SUBGRADE PREPARATION**

- A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and recompacting.
- B. Do not place fill on soft, muddy, or frozen surfaces.

### **3.3 TEST ROLLING SUBGRADE**

- A. Test rolling shall be used to verify stability and uniformity of subgrade. Perform this Work in presence of Engineer or Owner's Representative.
- B. Use test rolling equipment conforming to following description:
  - 1. Tandem axle, dual wheel dump truck.
  - 2. Tire pressure shall be no less than 90 percent of manufacturer's recommended maximum inflation.
  - 3. Minimum gross weight of loaded truck shall be 60,000 pounds.
  - 4. Provide weigh slip to Engineer or Owner's Representative.
- C. Perform test rolling procedure as follows:
  - 1. Operate equipment at a rate not to exceed 3 to 5 mph or a comfortable walking pace. Adjust speed to allow Engineer or Owner's Representative to measure any deflections and areas of rutting.
  - 2. Operate test rolling equipment in a pattern so that affected areas are loaded with at least one pass.
  - 3. After test rolling, check subgrade for conformance to drawings, and correct any surface irregularities. Re-shape subgrade within tolerances specified.
- D. Test Rolling Evaluation:
  - 1. Rutting up to 1-inch is acceptable. Rutting in excess of 1-inch but not more than 6 inches, shall be considered a failure and requires reworking soil and compaction to required density.
  - 2. Deflection (pumping) up to 1-inch is acceptable. Deflection in excess of 1-inch but not more than 2 inches shall be acceptable if there is not substantial cracking or lateral movement of soil.
  - 3. Deflection in excess of 2 inches but not more than 6 inches shall be considered a failure, and requires reworking soil and compaction to required density.
  - 4. Rutting and deflection in excess of 6 inches will require review and recommendation for corrective action by an approved Geotechnical Engineer.
  - 5. After remedial work is performed, a final test roll shall be performed upon completion of work.

6. If remedial work is performed as directed, second test roll may be waived at discretion of Engineer or Owner's Representative.

### 3.4 AGGREGATE INSTALLATION REQUIREMENTS

- A. Spread aggregate over prepared substrate to a total compacted thickness of 6 inches.
- B. Place aggregate in maximum 8-inch loose lifts and compact to specified density.
- C. Level and contour surfaces to elevations and gradients indicated.
- D. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.
- E. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
- F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

### 3.5 AGGREGATE SHOULDERS

- A. Construct aggregate shoulders to elevations and typical sections shown on Drawings, except for minor modifications needed to conform to other work.
- B. Use equipment that does not damage or mar pavement surface, curbs, or appurtenances.
- C. Place aggregate directly on shoulder area between pavement edge and outer shoulder limits.
- D. Recover uncontaminated material deposited outside limits and place within limits.
- E. Do not deposit aggregate on pavement during placement, unless Owner specifically allows. Do not leave aggregate on pavement overnight.
- F. After placing shoulder aggregate, keep pavement surface free of loose aggregate.
- G. Spread and compact aggregate in compacted layers of 6 inches or less.
- H. Compact aggregate until there is no appreciable displacement, either laterally or longitudinally, under compaction equipment.
- I. Route hauling equipment uniformly over previously placed base. Compact each layer before placing a subsequent layer.
- J. If gravel material is too dry to readily attain required compaction, add water as necessary to achieve compaction.
- K. After final compaction, shape shoulders to remove all longitudinal ridges to ensure proper drainage.

### 3.6 TOLERANCES

- A. Section 31 05 16 – Aggregates for Earthwork defines “A” designated base course materials.
- B. Flatness: Maximum variation of 1/4-inch measured with 10-foot straight edge.
- C. Scheduled Compacted Thickness: Within 1/4-inch.
- D. Variation from Design Elevation: Within 1/4-inch.

### 3.7 FIELD QUALITY CONTROL

- A. Division 01 - Basic Requirements: Quality Assurance / Quality Control for Installation: Field inspection.
- B. Perform compaction testing in accordance with ASTM D698, ASTM D1557, or ASTM D6938, and Division 01 - Basic Requirements: Quality Assurance / Quality Control for Installation.
- C. Perform moisture content testing in accordance with ASTM D6938 and Division 01 - Basic Requirements: Quality Assurance / Quality Control for Installation.
- D. If tests indicate Work does not meet specified requirements, remove Work, replace, and retest.
- E. Frequency of Tests: As determined by Engineer; one test on each 50 feet of pavement.

### 3.8 BASE COURSE SCHEDULE

- A. Section 31 05 16 – Aggregates for Earthwork defines “A” designated base course materials.
- B. Under Asphalt Pavement:
  - 1. Aggregate Type A1, compact to 95 percent modified Proctor density.
- C. Under Asphalt Sidewalk:
  - 1. Aggregate Type A1, compact to 95 percent modified Proctor density.

**END OF SECTION**

## SECTION 32 12 16

### ASPHALT PAVING

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Asphalt Paving Mix.
  - 2. Asphalt Materials.
  - 3. Aggregate Base Course.
  - 4. Primer Preparation.
  - 5. Tack Coat Preparation.
  - 6. Asphalt Pavement - Single Course Installation.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01 – Basic Requirements shall govern Work under this Section.
  - 2. Section 31 05 16 – Aggregates for Earthwork: Product requirements for aggregate for placement by this section.
  - 3. Section 31 22 13 - Rough Grading: Preparation of site for paving and base.
  - 4. Section 31 25 13 – Erosion controls: Installation and maintenance of erosion control system.
  - 5. Section 32 01 00 – Site Restoration: Restoration of grade adjacent to walkway.
  - 6. Section 32 11 23 - Aggregate Base Course: Compacted granular base for paving.

##### 1.2 REFERENCES

- A. State of Wisconsin Department of Transportation
  - 1. Standard Specifications for Highway and Structure Construction, Current Edition. (WISDOT)

##### 1.3 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal Procedures.
- B. Product Data: Submit product information and mix design.
- C. Certification: Provide Manufacturer’s Certification Report that indicates Products and Materials meet or exceed all specified requirements.

##### 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with Wisconsin Department of Transportation Standards.



- B. Mixing Plant: Conform to
  - 1. WISDOT Section 450.
- C. Obtain materials from same source throughout.

## 1.5 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this section with minimum five years experience.

## 1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or if surface is wet or frozen.
- B. Do not place binder course when temperature in the shade is below 40 degrees F, surface course when temperature in the shade is below 45 degrees F, or any course if surface is wet or frozen.
- C. Do not place asphaltic lift layers greater than 1-inch when temperature in the shade is below 40 degrees F, layers 1-inch or less when temperature in the shade is below 45 degrees F, leveling courses with of 50 lb/sq yd when temperature in the shade is 50 degrees F or any course if surface is wet or frozen.
- D. Temperature of asphaltic concrete upon discharge from mixer shall not exceed 325 degrees F, unless a higher temperature is recommended by asphalt cement supplier and approved by Engineer.
- E. Install Work in accordance with WISDOT Section 450.
- F. Place bitumen mixture when mixture temperature is not more than 15 degrees F below bitumen supplier's bill of lading and not more than maximum specified temperature.

## PART 2 PRODUCTS

### 2.1 ASPHALT PAVING MIX

- A. Use dry material to avoid foaming. Mix uniformly.
- B. Provide Asphaltic Concrete Surface Course Mixtures as specified below:
  - 1. 3-Inch Asphaltic Concrete Surface Course: WISDOT Section 460, Type E-03, in accordance with Table 460-1, Aggregate Gradation Master Range, 12.5 mm, and Table 460-2, Mixture Requirements, PG 64-22.
- C. Recycled Asphalt Pavement (RAP) may be used.
  - 1. Contractor may use up to 25 percent RAP for base, binder, and intermediate course mixtures.

2. Contractor may use up to 20 percent RAP in surface course mixtures.

2.2 ASPHALT MATERIALS

A. Tack Coat: SS-1, SS-1h, CSS-1, or CSS-1h in accordance with WISDOT Section 455.

2.3 SOURCE QUALITY CONTROL AND TESTS

A. Division 01 - Basic Requirements: Quality Assurance / Quality Control for Installation: Testing, inspection and analysis requirements.

B. Submit proposed mix design for each mixture for review prior to beginning of Work.

C. Provide test samples in accordance with Division 01 - Basic Requirements: Quality Assurance / Quality Control for Installation.

D. Perform Asphaltic Concrete Testing in accordance with WISDOT Section 460.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Division 01 - Basic Requirements: Coordination: Verification of existing conditions before starting work.

B. Verify compacted subgrade and aggregate base are acceptable and ready to support paving and imposed loads.

C. Verify gradients and elevations of base are correct.

3.2 AGGREGATE BASE COURSE

A. Section 32 11 23 - Aggregate Base Course forms base course construction for Work of this section.

3.3 TACK COAT APPLICATION

A. Apply tack coat in accordance with WISDOT Section 455.

B. Apply tack coat on asphalt or concrete surfaces over subgrade surface at uniform rate of 1/3 gal/sq yd.

C. Apply tack coat to contact surfaces of curbs, gutters, and existing pavement.

3.4 ASPHALT PAVEMENT - SINGLE COURSE INSTALLATION

A. Install asphalt pavement in accordance with WISDOT Section 450.

- B. Place asphalt within 24 hours of applying primer or tack coat.
- C. Place to 2-1/2 inch compacted thickness.
- D. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
- E. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

### 3.5 TOLERANCES

- A. Flatness: Maximum variation of 3/16-inch measured with 15-foot straight edge.
- B. Scheduled Compacted Thickness: Within 1/4-inch.
- C. Variation from Indicated Elevation: Within 1/4-inch.

### 3.6 FIELD QUALITY CONTROL

- A. Division 01 - Basic Requirements: Quality Assurance / Quality Control for Installation: Field inspecting, testing, adjusting, and balancing.
- B. Provide two 4-inch diameter disks, 2-1/2 inches high, each day that asphalt pavement is placed.

### 3.7 PROTECTION OF FINISHED WORK

- A. Division 01 - Basic Requirements: Protection of Installed Work: Protecting finished work.
- B. Immediately after placement, protect pavement from mechanical injury for 12 hours or until surface temperature is less than 140 degrees F, whichever occurs first.

**END OF SECTION**

**SECTION 32 31 13**  
**CHAIN LINK FENCES AND GATES**

**PART 1 GENERAL**

1.1 SUMMARY

A. Section Includes:

1. Fence framework, fabric, and accessories.
2. Excavation for post bases.
3. Concrete foundation for posts.
4. Manual gates and related hardware.

B. Related Sections:

1. Applicable provisions of Division 01 – Basic Requirements shall govern Work under this Section.
2. Section 03 31 00 - Structural Concrete: Concrete anchorage for posts.

1.2 REFERENCES

A. American Society of Civil Engineers: (ASCE)

1. ASCE 7-05, Section 6 - Basic Wind Speed (3-second gust).

B. ASTM International (American Society for Testing and Materials)

1. ASTM A121 - Specification for Metallic-Coated Carbon Steel Barbed Wire.
2. ASTM A392 - Specification for Zinc-Coated Steel Chain-Link Fence Fabric.
3. ASTM A491 - Specification for Aluminum-Coated Steel Chain-Link Fence Fabric.
4. ASTM A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
5. ASTM A824 Specification for Metallic-Coated Steel Marcellled Tension Wire for Use With Chain Link.
6. ASTM A1011 - Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
7. ASTM F552 - Standard Terminology Relating to Chain Link Fencing.
8. ASTM F567 – Practice for Installation of Chain-Link Fence.
9. ASTM F626 - Specification for Fence Fittings.
10. ASTM F900 - Specification for Industrial and Commercial Swing Gates.
11. ASTM F934 - Specification for Standard Colors for Polymer-Coated Chain Link Fence Materials.
12. ASTM F1043 - Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.
13. ASTM F1083 - Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.
14. ASTM F1345 - Specification for Zinc-5% Aluminum-Mischmetal Alloy-Coated Steel Chain-Link Fence Fabric.

- C. Chain Link Fence Manufacturers Institute: (CLFMI)
  - 1. CLFMI - Product Manual.
  - 2. CLFMI SFR2445 - Security Fence Recommendations.
  - 3. CLFMI WLG2445, Chain Link Fence Wind Load Guide for the Selection of Line Post and Line Post Spacing.
- D. Underwriter's Laboratories: (UL)
  - 1. UL 325 Door, Drapery, Gate, Louver and Window Operators.

### 1.3 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal Procedures.
- B. Shop Drawings: Indicate fence and gate layout, spacing of components, post foundation dimensions, hardware anchorage, gates, and schedule of components.
- C. Product Data: Submit data on fabric, posts, accessories, fittings, and hardware.
- D. Certifications: Manufacturers material certifications in compliance with current ASTM specifications.
- E. Manufacturer's Installation Instructions: Submit installation requirements and post foundation anchor bolt templates.

### 1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum five (5) years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum five (5) years documented experience.

### 1.5 QUALITY ASSURANCE

- A. Tolerances: Current published edition of ASTM specifications tolerances apply.
- B. ASTM specification tolerances supersede any conflicting tolerance.

### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Division 01 - Basic Requirements: Transportation, Handling, Storage and Protection: Requirements for transporting, handling, storing, and protecting products.
- B. Deliver fence fabric and accessories in packed cartons or firmly tied rolls.
- C. Identify each package with manufacturer's name.
- D. Store fence fabric and accessories in secure and dry place.

## **PART 2 PRODUCTS**

### **2.1 CHAIN LINK FABRIC**

- A. Polymer Coated Steel Fabric: ASTM F668, the wire gauge specified for polymer-coated wire is that of the metallic coated steel core wire 2 inch mesh, 9 gage, knuckle and knuckle selvage.
  - 1. Class 2b fused and adhered.
  - 2. Color: black in compliance with ASTM F934.

### **2.2 STEEL FENCE FRAMEWORK**

- A. Steel Pipe - Type I: ASTM F1043 Group IA, Table 3 - Heavy Industrial Fence Framework, standard weight Schedule 40 dot-dip galvanizing, having an exterior Type A zinc coating and an interior Type A zinc coating on the inside surface. Grades in accordance with ASTM F1083 as follows;
  - 1. Regular Grade: Minimum steel yield strength of 30,000 psi.
  - 2. Intermediate Strength Grade: Minimum steel yield strength of 50,000 psi.
  - 3. High Strength 83000 Grade: Minimum steel yield strength 83,000 psi.

### **2.3 COMPONENTS**

- A. Line Posts: Steel pipe Type I, Grade Regular; 1.9-inch diameter.
- B. Corner and Terminal Posts: Steel pipe Type I, Grade Intermediate Strength; 2.38-inch.
- C. Gate Posts: Steel pipe Type I, Grade Intermediate Strength; 2.38-inch diameter.
- D. Top and Brace Rail: Steel pipe Type I, Grade Regular; 1.66-inch diameter, plain end, sleeve coupled.
- E. Gate Frame: Steel pipe Type I, Grade Regular; 1.66 -inch diameter for welded fabrication.

### **2.4 TENSION WIRE**

- A. Metallic Coated Steel Marcellled Tension Wire: 7 gauge (0.177 in.) marcellled wire complying with ASTM A824.
  - 1. Type I Aluminum-Coated (Aluminized) 0.40 oz/ft<sup>2</sup>.

### **2.5 FITTINGS**

- A. Tension and Brace Bands: Galvanized pressed steel complying with ASTM F626, minimum steel thickness of 12 gage (0.105 inch), minimum width of 3/4-inch and minimum zinc coating of 1.20 oz/ft<sup>2</sup>. Bands supplied with 5/16-inch or 3/8-inch galvanized steel carriage bolts.
- B. Terminal Post Caps, Line Post Loop Tops, Rail and Brace Ends, Boulevard Clamps, Rail Sleeves: In compliance to ASTM F626, pressed steel galvanized after fabrication having a minimum zinc coating of 1.20 oz/ft<sup>2</sup>.

- C. Truss Rod Assembly: In compliance with ASTM F626, 3/8-inch diameter steel truss rod with a pressed steel tightener, minimum zinc coating of 1.2 oz/ft<sup>2</sup>, assembly capable of withstanding a tension of 2,000 lbs.
- D. Tension Bars: In compliance with ASTM F626. Galvanized steel one-piece length 2 inch less than the fabric height. Minimum zinc coating 1.2 oz. /ft<sup>2</sup>.
  - 1. Bars for 2 inch and 1-3/4 inch mesh shall have a minimum cross section of 3/16-inch by 3/4-inch.
  - 2. Bars for 1 inch mesh shall have a cross section of 1/4-inch by 3/8-inch.
  - 3. Bars for small mesh 3/8-inch, 1/2-inch and 5/8-inch shall be attached (sandwiched) to the terminal post using a galvanized steel strap having a minimum cross section of 2 inches by 3/16-inch with holes spaced 15 inches on center to accommodate 5/16-inch carriage bolts which are to be thru bolted thru the strap the mesh and thru the terminal post.

## 2.6 TIE WIRE AND HOG RINGS

- A. Tie Wire and Hog Rings:
  - 1. Galvanized minimum zinc coating 1.20 oz/ft<sup>2</sup>, 9 gage (0.148 inch) steel wire in compliance with ASTM F626.

## 2.7 SWING GATES

- A. Swing Gates:
  - 1. Single opening 3 ft. wide by 6 ft. high.
  - 2. Gate leaf shall swing 180 degrees outward.
  - 3. Galvanized steel welded fabrication in compliance with ASTM F900.
  - 4. Gate frame members 1.66-inch diameter, ASTM F1043 Group IA F1083 Schedule 40 pipe.
  - 5. Welded joints protected by applying zinc-rich paint in accordance with ASTM Practice A780.
  - 6. Positive locking gate latch fabricated of 5/16 in. thick by 1-3/4 inch pressed steel galvanized after fabrication with padlock eye.
  - 7. Galvanized malleable iron or heavy gauge pressed steel post and frame hinges. Match gate fabric to that of the fence system.
  - 8. Gateposts shall be 2.38-inch diameter, 3.11 lb/ft, ASTM F1043 Group IA ASTM F1083 Schedule 40 pipe.

## 2.8 CONCRETE

- A. Concrete for post footings shall be Type 1 maximum aggregate size of 3/4 inch.
- B. Concrete for post footings shall have a 28-day compressive strength of 3,000 psi.

## **PART 3 EXECUTION**

### **3.1 FRAMEWORK INSTALLATION**

#### **A. Posts:**

1. Posts shall be set vertically plumb in concrete footings in accordance with ASTM F567.
2. Minimum footing depth, 42 inches with increased depths as influenced by wind loads.
3. Minimum footing diameter four times the largest cross section of the post up to 4.00 inches O.D. and three times the largest cross section of post greater than 4.00 inches O.D.
4. Gate posts require larger footings, minimum requirements are established in ASTM F567.
5. Top of post concrete footing to be crowned to shed water away from the post.
6. Line posts installed at intervals not exceeding 10 feet on center, or as indicated on Drawings.

#### **B. Top Rail:**

1. When specified, install lengths of rail continuous through the line post or barb arm loop top.
2. Splice rail using top rail sleeves minimum 6 inches long.
3. Rail shall be secured to the terminal post by a brace band and rail end.
4. Bottom rail or intermediate rail shall be field cut and secured to the line posts using boulevard bands or rail ends and brace bands.

#### **C. Terminal Posts:**

1. End, corner, pull and gate posts shall be braced and trussed for fence 6 feet and higher.
2. The horizontal brace rail and diagonal truss rod shall be installed in accordance with ASTM F567.

#### **D. Tension Wire: Shall be installed 4 inches up from the bottom of the fabric.**

### **3.2 CHAIN LINK FABRIC INSTALLATION**

#### **A. Chain Link Fabric:**

1. Install fabric to outside of the framework.
2. Attach fabric to the terminal post by threading the tension bar through the fabric.
3. Secure the tension bar to the terminal post with tension bands and 5/16 inch carriage bolts spaced no greater than 12 inches on center.
4. Small mesh fabric less than 1 inch, attach to terminal post by sandwiching the mesh between the post and a vertical 2 inch wide by 3/16 inch steel bar using carriage bolts, thru bolted thru the bar, mesh and post spaced 15 inches on center.
5. Chain link fabric to be stretched taut free of sag.
6. Fabric to be secured to the line post with tie wires spaced no greater than 12 inches on center and to rail spaced no greater than 18 inches on center.
7. Secure fabric to the tension wire with hog rings spaced no greater than 12 inches apart.



8. Tie wire shall be wrapped around the post or rail and attached to the fabric wire picket on each side by twisting the tie wire around the fabric wire picket two full turns.
9. Excess wire shall be cut off and bent over to prevent injury.
10. The installed fabric shall have a ground clearance on no more than 2 inches.

### 3.3 GATE INSTALLATION

#### A. Swing Gates:

1. Installation of swing gates and gateposts in compliance with ASTM F567, unless specified otherwise.
2. Gates shall be vertically plumb in the closed position having a bottom clearance of 3 inches grade permitting.
3. Hinge and latch offset opening space from the gate frame to the post shall be no greater than 3 inches in the closed position.

### 3.4 NUTS AND BOLTS

#### A. Bolts:

1. Carriage bolts used for fittings shall be installed with the head on the secure side of the fence.
2. All bolts shall be peened over to prevent removal of the nut.

### 3.5 ELECTRICAL GROUNDING

- #### A. Grounding: A licensed electrical contractor shall install grounding to each 6 ft. high fence area.

### 3.6 CLEAN UP

- #### A. Clean up the area of the fence line caused by the installation of the fence.

**END OF SECTION**

## SECTION 35 20 16

### MITER GATES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Fabrication, transportation, delivery, and erection of miter gates.
  - 2. Trunion pins.
  - 3. Miter gate top connections.
  - 4. Structural steel, framing members, support members, face plate, bracing, welds, fasteners, and adjustment arms.
  - 5. Base plates, anchor rods, and bearing plates.
  - 6. Inserts for steel work.
  - 7. Non-shrink grout under base plates.
  - 8. Cutting, fitting, removal, and revision to existing structural framing and connections in order to fit new work to existing.
  - 9. Seals.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01- Basic Requirements shall govern all work under this Section.
  - 2. Section 09 96 00 - High Performance Coatings: Finish painting.
  - 3. Section 35 20 17 – Hydraulic Equipment for Miter Gates.

##### 1.2 REFERENCES

- A. ASTM International (American Society for Testing and Materials)
  - 1. ASTM A36 - Standard Specification for Carbon Structural Steel.
  - 2. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - 3. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - 4. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  - 5. ASTM A563 – Standard Specification for Carbons and Alloy Steel Nuts.
  - 6. ASTM A992 - Standard Specification for Structural Steel Shapes.
  - 7. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
  
- B. American Welding Society (AWS).
  - 1. AWS A2.0 - Standard Welding Symbols.
  - 2. AWS D1.1 - Structural Welding Code.

- C. American Institute of Steel Construction, Inc (AISC).
  - 1. AISC – Steel Construction Manual, Current Edition.
  - 2. AISC - Code of Standard Practice for Steel Buildings and Bridges.
  - 3. AISC - Specification for Architectural Exposed Structural Steel.
- D. Research Council on Structural Connections (RCSC)
  - 1. RCSC - Specification for Structural Joints Using ASTM A325 or A490 Bolts.
- E. The Society for Protective Coatings (SSPC)
  - 1. Volume 1 – Good Painting Practices, Current Edition.
  - 2. Volume 2 – Systems and Specifications.

### 1.3 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal Procedures.
- B. Shop and Erection Drawings:
  - 1. Indicate profiles, sizes, spacing, and locations of structural members, openings, attachments, and fasteners.
- C. Show all connections.
  - 1. Indicate welded connections with AWS A2.0 welding symbols. Indicate net weld lengths.
  - 2. Indicate cleaning and painting specifications.
  - 3. Assume responsibility for dimensional errors.
  - 4. Field verify dimensions affected by existing construction prior to submitting Shop Drawings and so note verified dimensions on shop drawings.
  - 5. Field verify existing anchor bolt placements and modify base plates to accommodate field conditions.
  - 6. Fabricator shall check shop drawings before Submittal.
- D. Welders Certificates: Submit under provisions of Division 01 – Basic Requirements: Manufacturers’ Certificates, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

### 1.4 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC -Specifications and the AISC Code of Standard Practice for Steel Buildings and Bridges.

### 1.5 QUALIFICATIONS

- A. Fabricator: Company specializing in performing the work of this Section with minimum five years documented experience and AISC Certified.
- B. Erector: Company specializing in performing the work of this Section with minimum five years documented experience.

1.6 FIELD MEASUREMENTS

- A. Verify that field measurements are as shown on Drawings and shop drawings.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Structural Steel W-Shape and WT-Shape Members: ASTM A992, Fy = 50 ksi.
B. Structural Steel Angles, Plates, Channels and Other Rolled Members: ASTM A36, Fy = 36 ksi.
C. Bolts, Nuts, and Washers: ASTM A325 High-Strength Bolts, Type 1 - Medium Carbon, Carbon Boron or Medium Carbon Alloy Steel finish; with ASTM A563 heavy hex nuts and ASTM F436 washers, head markings on bolts, fully traceable;
D. Rubber Seals:
1. Rubber seals shall be fluorocarbon (Teflon) clad rubber seals of the mold type only, shall be compounded of natural rubber, synthetic polyisoprene, or a blend of both, and shall contain reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents, and plasticizers.
a. Physical Characteristics: Physical characteristics of the seals shall meet the following requirements:

Table with 3 columns: PHYSICAL TEST, TEST VALUE, TEST METHOD SPECIFICATION. Rows include Tensile Strength, Elongation at Break, 300% Modulus, Durometer Hardness (Shore Type A), \*Water Absorption, Compression Set, and Tensile Strength (after aging 48 hours).

- 2. The "Water Absorption" test shall be performed with distilled water. The washed specimen shall be blotted dry with filter paper or other absorbent material and suspended by means of small glass rods in the oven at a temperature of 70 degrees C plus or minus 2 degrees for 22 plus or minus 1/4 hour. The specimen shall be removed, allowed to cool to room temperature in air, and weighed. The weight shall be recorded to the nearest 1 mg as M subscript 1 (M subscript 1 is defined in ASTM D 471). The immersion temperature shall be 70 degrees C plus or minus 1 degree and the duration of immersion shall be 166 hours.

- E. Threaded Anchor Bolts (Anchor Rods): ASTM F1554, Class 2A threads; Grade 55 - Weldable; straight; headless with ASTM A563 heavy hex nuts, and ASTM F436, Type 1 washers.

- F. Welding Electrodes: E70XX and shall comply with AWS D1.1; type required for materials being welded.
- G. Non-Shrink Grout: Pre-mixed compound with non-metallic aggregate, cement, water reducing and plasticizing agents; capable of minimum compressive strength of 7,000 psi.
- H. Shop Primer: Interior steel receiving no additional Coatings: Universal Metal Primer for Structural Steel.
- I. Shop Primer: Exposed Interior and Exterior Steel Receiving Additional Coatings: Primer shall be Universal Metal Primer for Structural Steel compatible with subsequent finish coats specified in 09 96 00 – High Performance Coatings.
- J. Drilled anchors shall be HY 150 as manufactured by Hilti.

## 2.2 FABRICATION

- A. Fabricate items of structural steel in accordance with AISC specifications, and as shown on approved shop drawings.
- B. Field connections are to be bolted unless welded, or other types of connections are indicated.
- C. Bolted connections shall be made with ASTM A325 high strength bolts, unless otherwise noted.
- D. Install high strength threaded fasteners in accordance with RCSC - “Specifications for Structural Joints Using ASTM A325 or A490 bolts”.
- E. Welding shall comply with AISC and AWS Codes for procedures, appearance, quality of welds, and for methods used in correcting welding work.
- F. All welds shall be made by AWS pre-qualified welders, certified for welds made.
- G. Minimum size of fillet welds shall be as specified in TABLE J2.4 of AISC Manual of Steel Construction.
- H. Minimum Strength of Welded Connections: Unless noted otherwise on drawings, all shop and field welds shall develop full tensile strength of member of element joined.
- I. All members with moment connections, noted on drawings, shall be welded to develop full flexural capacity of member, unless noted otherwise on drawings.
- J. Provide holes required for securing other work to structural steel framing and for passage of other work through steel members, as shown on approved shop drawings.
- K. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

- L. Verify or supplement dimensions shown on Drawings by field measurements to assure fit of new work.
- M. Jointed members shall be sealed with continuous welds unless otherwise noted.

2.3 FINISH

- A. Prepare interior structural component surfaces for general work in accordance with SSPC - SP1 and SP3 as a minimum.
- B. Prepare structural component surfaces of exterior steel in accordance with SSPC - SP1 and SP6 as a minimum.
- C. Coated surfaces, interior or exterior, shall be prepared in accordance with coating manufacturer's SSPC requirements if more stringent than listed above.
- D. Shop Primed Structural Steel Members: Minimum one coat for interior steel, minimum two coats for exterior steel. Prime coats shall be a minimum of 2.4 mils dry thickness unless manufacturer has more stringent requirements.
- E. Galvanize structural steel members to ASTM A123.
- F. Provide minimum 2.0 oz/sq ft, (3.4 mils) galvanized coating for members 3/16-inch to 1/4-inch thick, and 2.3 oz/sq ft, (3.9 mils) for members greater than or equal to 1/4-inch.
- G. Rubber Seal Fabrication:
  - 1. Rubber seals shall have a fluorocarbon film vulcanized and bonded to the sealing surface of the bulb. The film shall be 0.030 inch thick Huntington Abrasion Resistant Fluorocarbon Film No. 4508, or equal, and shall have the following physical properties:

Tensile Strength	13.8 MPa2,000 psi (min.)
Elongation	250 percent (min.)

- 2. The outside surface of the bonded film shall be flush with the surface of the rubber seal and shall be free of adhering or bonded rubber. Strips and corner seals shall be molded in lengths suitable for obtaining the finish lengths shown and with sufficient excess length to provide test specimens for testing the adequacy of the adhesion bond between the film and bulb of the seal. At one end of each strip or corner seal to be tested, the fluorocarbon film shall be masked during bonding to prevent a bond for a length sufficient to hold the film securely during testing.

**PART 3 EXECUTION**

3.1 PREPARATION

- A. Verify that field conditions are acceptable and are ready to receive work in accordance with Drawings and shop drawings.

- B. Verify anchors and anchor rods have been preset into connection work in accordance with Drawings and shop drawings.
- C. Beginning of installation and erection means that existing conditions have been checked and found acceptable.
- D. Cost of corrections shall be borne by this Section if variances are not identified prior to start of installation.

### 3.2 ERECTION

- A. Erect structural steel in accordance with AISC Specifications.
- B. Store steel on site on substantial shores or blocking to keep free of ground and to prevent bending, buckling, or twisting.
- C. Prevent water collection on members.
- D. Do no final bolting or welding until structure has been properly aligned and plumbed.
- E. Do not field cut or alter structural members without prior approval of Engineer.
- F. Field weld components indicated on Drawings and shop drawings.
- G. All bolted joints may be installed as Snug Tightened joints as specified and permitted in the RCSC - Specification, unless otherwise noted.
- H. Pretension all high strength bolts for Pretension or Slip-Critical (S.C.) Joints to minimum bolt pretension specified in Table 8.1 of RCSC - Specification for Structural Joints Using ASTM A325 or A490 Bolts, Current Edition.
- I. Clean and prime welds, bolt and rivet heads, abrasions of prime coat, and surfaces not previously shop primed or galvanized, except surfaces to be in contact with concrete after erection.
- J. Grout solid under base plates and bearing plates in accordance with AISC - Code of Standard Practice for Steel Buildings and Bridges.
- K. Contact surfaces of field connections shall be free from dust, oil, loose scale, burrs, pits, and other defects that prevent solid seating of parts.
- L. Clean all surfaces of dirt, mud, oil, or grease that would impair bonding of fireproofing or concrete.
- M. Reaming is not allowed if reaming weakens or makes it impossible to fill holes or adjust accurately after being reamed.

### 3.3 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: 3/16 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/8 inch.

### 3.4 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Division 01 – Basic Requirements: Quality Assurance / Quality Control of Installation.
- B. Acceptance Trial Operation:
  - 1. After completion of the gate installation, the Engineer will examine the gates for final acceptance. The gates will be examined first to determine whether or not the workmanship conforms to the specification requirements. Contractor will then be required to operate the gates from the fully-opened to the fully-closed position a sufficient number of times to demonstrate to the Engineer's satisfaction that all parts are functioning properly. The workmanship in the fabrication and installation of gates shall be such that the gates in the closed position will form a watertight barrier across the opening. Required repairs or replacements to correct defects, as determined by the Engineer, shall be made at no cost to the Government. The trial operation shall be repeated after defects are corrected. Prior to final acceptance of the gates, provide temporary restraints to prevent unauthorized operation of the gates.

**END OF SECTION**



## SECTION 35 20 17

### HYDRAULIC SYSTEM FOR MITER GATES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
1. Design, fabrication, installation of hydraulic system for opening and closing miter gates; includes oscillator motors for two equalizing valves at each lock and hydraulic rams for four miter gates at each lock, hydraulic pump, programmable flow regulators, and control panels.
  2. Stainless hydraulic piping along locks and flexible piping encased in PVC conduit underground.
- B. Related Sections:
1. Applicable provisions of Division 01 – Basic Requirements shall govern all work under this Section.
  2. Section 05 50 00 – Metal Fabrications: Structural steel support brackets for mounting oscillators and rams.

##### 1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM International):
1. ASTM A36 – Standard Specification for Carbon Structural Steel.
  2. ASTM A106 Grade B Carbon Steel Pipe.

##### 1.3 DESIGN CRITERIA

- A. Hydraulic contractor shall design hydraulic system meeting the following minimum design criteria:
1. Weight of each miter gate: 20,000 pounds – See existing drawing sheet 88-30.
  2. Maximum head of water behind gates: See Drawings.
  3. Hydraulic oscillators will be installed at each equalizing valve shaft.
  4. Hydraulic rams must open and close miter gate uniformly with same speed.
  5. Total time to open or close gates is 45 seconds.
  6. Minimum factor of safety for hydraulic equipment to open or close miter gates is 1.5.
  7. Existing hydraulic piping to be tested. Existing piping to be pressurized with 2500 psi pressure and held for 15 minutes. If no leaks are evident and pressure holds, then existing piping will be reused. If existing hydraulic piping does not hold pressure, then existing hydraulic piping will be replaced with new steel piping meeting ASME B31.1 codes.
  8. Install filter indicator lights for changing filter and dual filters for filter system.

9. Minimum warranty period for hydraulic system against any defects is two years. Hydraulic system must be designed for a minimum user life of 30 years assuming gates are opened 100 times/year.

#### 1.4 SUBMITTALS

- A. Engineering Calculations, Shop and Erection Drawings:
  1. Hydraulic contractor shall submit engineering calculations on hydraulic system along with shop and erection drawings for entire system. Shop drawings shall be detailed showing all equipment specified, electrical panels, computer boards, hydraulic lines, and electrical requirements.
  2. Hydraulic contractor shall coordinate his submittals with all other trades, i.e. electrical contractor, steel erector, plumbing piping contractor, etc.

#### 1.5 QUALIFICATIONS

- A. Hydraulic contractor and/or hydraulic company specializing in performing the work of this section with a minimum of five years of documented experience.

#### 1.6 FIELD MEASUREMENTS

- A. Verify that field measurements are as shown on existing drawings, construction documents and shop drawings.

### **PART 2 PRODUCTS**

#### 2.1 MATERIALS AND EQUIPMENT

- A. Hydraulic contractor and/or hydraulic company shall furnish all equipment necessary to meet minimum design criteria noted under section 1.3.
- B. Hydraulic steel piping: ASTM A106 Grade B schedule 40 piping matching existing piping size and gage. Minimum pressure is 2800 psi at 400 degrees F.
- C. Structural Steel angles, plates, channels, and other Rolled Members: ASTM A36, Fy=36 ksi.
- D. Shop Primer: Exposed interior and exterior steel receiving additional coatings: Primer shall be Universal Metal Primer for structural steel compatible with subsequent finish coats specified in Division 09.

#### 2.2 FABRICATION

- A. Hydraulic contractor and/or hydraulic company shall fabricate all equipment so that it meets industry standards & design criteria listed under section 1.3 and as shown on approved shop drawings.

- B. Fabricate items of structural steel in accordance with AISC specifications, and as shown on approved shop drawings.

### **PART 3 EXECUTION**

#### **3.1 PREPARATION AND ERECTION/INSTALLATION**

- A. Verify that field conditions are acceptable and are ready to receive work in accordance with drawings and shop drawings.
- B. Erect and install all equipment, piping, structural steel supports, and electrical panels per approved shop drawings.
- C. Install new hydraulic piping per approved shops drawings.

#### **3.2 FIELD QUALITY CONTROL AND DOCUMENTATION**

- A. Hydraulic contractor and/or hydraulic company must provide internal inspection testing and field inspection necessary and submit to A/E and owner for their records.
- B. Hydraulic contractor and/or hydraulic company must provide all O & M manuals (three minimum) to owner on operation of hydraulic system and its components. A final operational meeting(s) shall be provided by hydraulic contractor and/or hydraulic company instructing the owner on usage and operation of all equipment.

#### **3.3 MAINTENANCE AGREEMENT**

- A. Hydraulic contractor and/or hydraulic company must provide a maintenance agreement to provide annual maintenance on hydraulic system for five years. This includes furnishing filters, checking contaminants in oil and draining/replacing hydraulic oil.

**END OF SECTION**

## SECTION 35 20 18

### VERTICAL LIFT WEIR GATES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Fabrication, transportation, delivery, and erection of dual leaf weir gates.
  - 2. Surface mounted gate frame and base plate.
  - 3. Seals.
  - 4. Electric motor actuator and dual 90 degree gearboxes
  - 5. Cutting, fitting, removal, and revision to existing structure and connections in order to fit new work to existing conditions.
  
- B. Related Sections:
  - 1. Applicable provisions of Division 01 Basic Requirements shall govern all work under this Section.
  - 2. Section 35 20 19 – Automated Remote Controls for Lift Gates.

##### 1.2 System Description

- A. Custom designed vertical lift weir gates shall be dual leaf designed to fit between existing concrete piers and dam base slab. Gates shall be designed with a stationary lower leaf and an adjustable top leaf controlled by dual threaded rising stems. Lower gate shall be controlled by a manually operated latch from the top of the upper gate to the top of the lower gate. Design shall be capable of raising both leaves above the dam walkway for service and the winter storage location.
  
- B. Gates shall be designed for the maximum flood elevation as indicated on the drawings. Design shall be in accordance with the United States Army Corps of Engineering (USACE) manual for design of vertical lift Gates (EM 1110-2-2702)
  
- C. Gates leaves may be constricted of type 304 stainless steel or galvanized steel.
  
- D. Gate frame shall be continuous from base slab to operator and hoist support beam. Frame shall be of the same material as the gate leaves. A grouted base plate should be provided for bottom seal seating. Side slides guides may be ultra high molecular weight polyethylene or roller wheels.
  
- E. Seals may be ultra high molecular weight polyethylene or neoprene rubber. Maximum leakage under full head conditions shall be less than 0.25 gallons per minute per foot of gate perimeter.
  
- F. Stems shall be ASTM A276 Type 304 stainless steel with polycarbonate covers and cap. Hoist gearbox at each stem shall be designed for 90 degree drive shafts. Drive shafts shall be

stainless steel. A visual indicator with graduations on the cover shall be provided to indicate top leaf elevation.

- G. Actuator shall consist of an electric motor with internal starter and worm gear reduction for dual drive shafts. Actuator shall have a declutch lever and hand wheel for manual operation in case of power failure. Control switches shall be provided on the unit for onsite control of gate. Enclosure shall be sealed to NEMA 4X. Motor shall be three phase 208 volt.
- H. The gearbox shall be designed for fully weatherproof in NEMA 4 housing with machined gears for smooth operation. Motor and gearbox shall be mounted at the center of the hoist beam.
- I. Actuator shall have internal digital processor to provide for remote control, determination of gate position and torque sensor to determine a jammed gate condition. Motor shall automatically shut down upon sensing an over torque. Actuator selection shall be coordinated with automated remote control operating system.
- J. Hoist gearboxes, stem actuator shall be designed to permit manual operation of the gate with a maximum of 40 lbs on the hand wheel.

### 1.3 REFERENCES

- A. ASTM International (American Society for Testing and Materials)
  - 1. ASTM A36 - Standard Specification for Carbon Structural Steel.
  - 2. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - 3. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - 4. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  - 5. ASTM A563 – Standard Specification for Carbons and Alloy Steel Nuts.
  - 6. ASTM A992 - Standard Specification for Structural Steel Shapes.
  - 7. ASTM A267 - Standard Specification for Type 304 stainless steel.
- B. American Welding Society (AWS).
  - 1. AWS A2.0 - Standard Welding Symbols.
  - 2. AWS D1.1 - Structural Welding Code.
  - 3. AWS D1.6 - Structural Welding Code (stainless steel).
- C. American Institute of Steel Construction, Inc (AISC).
  - 1. AISC – Steel Construction Manual, Current Edition.
  - 2. AISC - Code of Standard Practice for Steel Buildings and Bridges.
  - 3. AISC - Specification for Architectural Exposed Structural Steel.

### 1.4 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal procedures.

- B. Shop Drawings:
  - 1. The designer shall submit plans and details for the construction and materials for gate, frame, lifting mechanism and lower gate latching mechanism.
  - 2. Indicate welded connections with AWS A2.0 welding symbols. Indicate net weld lengths.
  - 3. Indicate bolt specification and sizes.
  - 4. Indicate seals material and sizes.
  - 5. Provide hoisting equipment and actuator specifications.
  - 6. Field verify existing dimensions and modify frame and base plate to accommodate field conditions.
  
- C. The manufacture shall provide erection drawings:
  - 1. Field verify dimensions affected by existing construction prior to submitting Shop Drawings and so note verified dimensions on shop drawings.
  - 2. Provide actuator electrical requirements to engineer within 2 weeks of notice to proceed.
  
- D. Calculations:
  - 1. Provide calculations for gate indicating maximum member stresses.
  - 2. Provide calculations for torque requirements of gate.

#### 1.5 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC -Specifications and the AISC Code of Standard Practice for Steel Buildings and Bridges.
  
- B. Actuator shall have a design life of one million drive sleeve turns.

#### 1.6 QUALIFICATIONS

- A. Designer: Engineer specializing in performing the work of this Section with minimum five years experience.
  
- B. Manufacture: Company specializing in performing the work of this Section with minimum five years experience
  
- C. Erector: Company specializing in performing the work of this Section with minimum three years experience.

#### 1.7 FIELD MEASUREMENTS

- A. Verify that field measurements are as shown on Drawings and shop drawings.

### **PART 2 PRODUCTS**

#### 2.1 GATES

- A. Manufacturers:

1. Golden Harvest
2. Rodney Hunt
3. Fontaine.
4. Coldwell - Wilcox
5. Substitutions: In accordance with Division 01- Substitutions

2.2 ACTUATORS

- A. Manufacturers:
1. Flowsolve -Limatorque
  2. Auma
  3. EIM
  4. Substitutions: In accordance with Division 01- Substitutions

2.3 MATERIALS

- A. Structural Steel W-Shape and WT-Shape Members: ASTM A992, Fy = 50 ksi. Galvanized after fabrication ASTM A123 2.0 oz /sq ft
- B. Structural Steel Angles, Plates, Channels and Other Rolled Members: ASTM A36, Fy = 36 ksi. Galvanized after fabrication ASTM A123 2.0 oz /sq ft
- C. Stainless steel shapes and plates: ASTM Standard Specification for Type 304 stainless steel.
- D. Bolts, Nuts, and Washers: ASTM A325 High-Strength Bolts, Type 1 – Medium Carbon, Carbon Boron or Medium Carbon Alloy Steel finish; with ASTM A563 heavy hex nuts and ASTM F436 washers, head markings on bolts, fully traceable;
- E. Rubber Seals:
1. Rubber seals shall be fluorocarbon (Teflon) clad rubber seals of the mold type only, shall be] compounded of natural rubber, synthetic polyisoprene, or a blend of both, and shall contain reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents, and plasticizers.
    - a. Physical Characteristics: Physical characteristics of the seals shall meet the following requirements:

PHYSICAL TEST	TEST VALUE	TEST METHOD SPECIFICATION
Tensile Strength	17.2 MPa2,500 psi (min)	ASTM D412
Elongation at Break	450% (min.)	ASTM D412
300% Modulus	6.2 MPa900 psi (min)	ASTM D412
Durometer Hardness (Shore Type A)	60 to 70	ASTM D2240
*Water Absorption	5% by weight (max.)	ASTM D471
Compression Set	30% (max.)	ASTM D395
Tensile Strength (after aging 48 hours)	80% tensile strength (min.)	ASTM D572

2. The "Water Absorption" test shall be performed with distilled water. The washed specimen shall be blotted dry with filter paper or other absorbent material and suspended by means of small glass rods in the oven at a temperature of 70 degrees C plus or minus 2 degrees for 22 plus or minus 1/4 hour. The specimen shall be removed, allowed to cool to room temperature in air, and weighed. The weight shall be recorded to the nearest 1 mg as M subscript 1 (M subscript 1 is defined in ASTM D 471). The immersion temperature shall be 70 degrees C plus or minus 1 degree and the duration of immersion shall be 166 hours.

- F. Anchors to existing concrete dam shall be stainless steel.
- G. Welding Electrodes: E70XX and shall comply with AWS D1.1; type required for materials being welded.
- H. Non-Shrink Grout: Pre-mixed compound with non-metallic aggregate, cement, water reducing and plasticizing agents; capable of minimum compressive strength of 7,000 psi.

#### 2.4 FABRICATION

- A. Fabricate items of in accordance with USACE and AISC specifications, and as shown on approved shop drawings.
- B. Field connections are to be bolted.
- C. Welding shall comply with AISC and AWS Codes for procedures, appearance, quality of welds, and for methods used in correcting welding work.
- D. All welds shall be made by AWS pre-qualified welders, certified for welds made.
- E. Verify or supplement dimensions shown on Drawings by field measurements to assure fit of new work.
- F. Face plate shall be sealed with continuous welds.

#### 2.5 FINISH

- A. Prepare steel gates and frames to be galvanized in accordance with SSPC - SP1 and SP3 as a minimum.
- B. Coated surfaces, interior or exterior, shall be prepared in accordance with coating manufacturer's SSPC requirements if more stringent than listed above.
- C. Galvanize structural steel members to ASTM A123.
- D. Provide minimum 2.0 oz/sq ft, (3.4 mils) galvanized coating for member's 3/16-inch to 1/4-inch thick, and 2.3 oz/sq ft, (3.9 mils) for members greater than or equal to 1/4-inch.
- E. Stainless steel: ASTM A267, Type 304.



F. Rubber Seal Fabrication:

1. Rubber seals shall have a fluorocarbon film vulcanized and bonded to the sealing surface of the bulb. The film shall be 0.030 inch thick Huntington Abrasion Resistant Fluorocarbon Film No. 4508, or equal, and shall have the following physical properties:

Tensile Strength	13.8 MPa2,000 psi (min.)
Elongation	250 percent (min.)

2. The outside surface of the bonded film shall be flush with the surface of the rubber seal and shall be free of adhering or bonded rubber. Strips and corner seals shall be molded in lengths suitable for obtaining the finish lengths shown and with sufficient excess length to provide test specimens for testing the adequacy of the adhesion bond between the film and bulb of the seal. At one end of each strip or corner seal to be tested, the fluorocarbon film shall be masked during bonding to prevent a bond for a length sufficient to hold the film securely during testing.

### PART 3 EXECUTION

#### 3.1 PREPARATION

- A. Verify that field conditions are acceptable and are ready to receive work in accordance with Drawings and shop drawings.
- B. Verify anchors and anchor rods have been preset into connection work in accordance with Drawings and shop drawings.
- C. Beginning of installation and erection means that existing conditions have been checked and found acceptable.
- D. Cost of corrections shall be borne by this Section if variances are not identified prior to start of installation.

#### 3.2 ERECTION

- A. Erect structural steel in accordance with AISC Specifications.
- B. Store Gates on site on substantial shores or blocking to keep free of ground and to prevent bending, buckling, or twisting.
- C. Do no final bolting or welding until structure has been properly aligned and plumbed.
- D. Existing concrete shall not be removed greater than 1 inch deep for fit up of gates.
- E. Do not field cut or alter structural members without prior approval of the manufacture and Engineer.

- F. All bolted joints shall be installed indicated on the erection drawings. Pretension all high strength bolts for Pretension or Slip-Critical (S.C.) Joints to minimum bolt pretension specified in Table 8.1 of RCSC - Specification for Structural Joints Using ASTM A325 or A490 Bolts, Current Edition.
- G. Grout solid under base plate and side plates in accordance with AISC - Code of Standard Practice for Steel Buildings and Bridges.
- H. Contact surfaces of field connections shall be free from dust, oil, loose scale, burrs, pits, and other defects that prevent solid seating of parts.

### 3.3 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: 1/8 inch.
- B. Maximum Offset From True Alignment: 1/8 inch.

### 3.4 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Division 01 – Basic Requirements.
- B. Acceptance Trial Operation:  
After completion of the gate installation, the Engineer will examine the gates for final acceptance. The gates will be examined first to determine whether or not the workmanship conforms to the specification requirements. Contractor will then be required to operate the gates from the fully-opened to the fully-closed position a sufficient number of times to demonstrate to the Engineer's satisfaction that all parts are functioning properly. The workmanship in the fabrication and installation of gates shall be such that the gates in the closed position will form a watertight barrier across the opening. Required repairs or replacements to correct defects, as determined by the Engineer, shall be made at no cost to the Government. The trial operation shall be repeated after defects are corrected. Prior to final acceptance of the gates, provide temporary restraints to prevent unauthorized operation of the gates.

**END OF SECTION**

## SECTION 35 20 19

### VERTICAL LIFT GATE AUTOMATED CONTROLS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
1. Control wiring from gate actuators to control cabinet.
  2. Camera monitoring installation and wiring to control cabinet.
  3. Programmable Logic Controller.
  4. Secure internet interface (PC).
  5. Internet connection.
  6. System Training
  7. Technical support
- B. Related Sections:
1. Applicable provisions of Division 01 Basic Requirements shall govern all work under this Section.
  2. Section 35 20 18 – Vertical Lift Weir Gates – Electric Actuators

##### 1.2 SYSTEM DESCRIPTION

- A. Remote control and monitoring of dam gate and actuators shall be designed, supplied installed, and tested by contractor. System shall include all equipment and be complete in all manner of operation as specified herein.
1. System shall provide remote control of each dam gate from designated owner's windows based PC. Controls shall be capable of opening, stopping and lowering dam gates. System shall also be capable of adjusting gate height to an inputted elevation.
  2. System shall be capable of indicating to offsite PC a jammed condition of the gate.
  3. System shall include all wiring from actuators to control cabinet.
  4. System shall include a video camera for each gate. Video camera shall be selected located and aimed to show the full width of the gate selected. System shall include all wiring of cameras to the secure internet interface.
  5. System shall be designed for the digital protocol provide by the actuator supplier.
  6. System shall include all software require d to operate and monitor the dam gates
- B. System shall be expandable from the current number of motor controlled gates to the maximum number of gates at each site without replacement of equipment.
1. Babcock Dam. – 2 gates expandable to 4 gates
  2. LaFollette Dam – 1 gate expandable to 3 gates
- C. Contractor shall design provide and install all environmental control systems in control panel required to maintain temperature and humidity inside control cabinet required to maintain equipment manufactures warranties.

- D. Operating software shall be written to provide an intuitive interface. The operating screen shall show the video of the selected gate camera in a minimum of 1/4 of the monitor area. A display at the bottom of the monitor shall indicate the the present elevation of every gate, and the jammed status of each gate. The video view of the gate selected and elevation display shall remain visible at all times. Upon selection of a gate the camera view should change to the selected gate and a control screen should be visible to raise or lower the gate. The gate position indicator should be update in real time. Position indicator shall show top of gate elevation.
- E. Software shall require two secure passwords to access remote control equipment.
- F. Owner supplied services and information and equipment:
  - 1. Owner shall arrange and pay for internet service to control cabinet.
  - 2. Owner shall supply all information requested by contractor regarding their PC operating system memory capacities.
  - 3. Owner shall upgrade or provide the remote PC's intended for use to control and monitor the dam gates if necessary for integration with the system design.

### 1.3 REFERENCES

- A. Consumer Electronics Association
  - 1. CEA-709.1 Control network Protocol
  - 2. Provide equipment specification sheet for each piece of equipment.

### 1.4 SUBMITTALS

- A. Division 01 – Basic Requirements: Submittal procedures.
- B. Shop and Electrical Drawings:
  - 1. Provide equipment specification sheet for each piece of equipment.
  - 2. Provide wiring diagram indicating interconnection of each piece of equipment including actuator.
- C. Operation and Maintenance Manuals
  - 1. Provide operation and maintenance manuals for each piece of equipment.

### 1.5 QUALIFICATIONS

- A. System Designer: Company specializing in performing the work of this Section with minimum five years documented experience.
- B. Installer: Company specializing in performing the work of this Section with minimum five years documented experience.

### 1.6 FIELD VERIFICATION

- A. Verify that field cabinet dimensions are acceptable for onsite equipment.

- B. Verify control protocol of selected actuator.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS AND EQUIPMENT**

- A. System designer is responsible for the selection of all equipment to provide a minimum service life of ten years.
- B. Equipment is to be mounted in a weatherproof exterior electrical cabinet. All equipment shall be capable of operating in the expected environment or environmental controls for the cabinet should be provided and installed as part of this system.
- C. Hardware shall be based on standardized industrial computer components and shall be equipped with Modbus interface.

### **2.2 WARRENTY**

- A. Provide a two year joint and several warranty of all equipment.
- B. Provide a two year maintenance contract between system designer and owner. Maintenance contract shall include a minimum of one site visit each year to inspect and maintain the system. Maintenance does not include service covered under system warranty.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Verify Internet bandwidth available at each site.
- B. Verify Owners PC operating system and provide minimum requirements for communication with onsite computer system.
- C. Coordinate system selection and design with actuator supplier.

### **3.2 PREDESIGN MEETING**

- A. Contractor and system designer shall meet with the engineer and owner within 3 weeks of contract acceptance to review the system requirements.
- B. System designer shall present equipment selections, camera selections and locations and provide owner with visual representation of the remote PC monitor displays for review and acceptance.
- C. Revise remote PC screen display to incorporate owner's comments.

### 3.3 INSTALLATION

- A. Install control equipment in electrical cabinet onsite.
- B. Provide and install all wiring from control equipment to actuators.
- C. Connect to control system to internet.
- D. Provide and install any required environmental controls in electrical cabinet.

### 3.4 FIELD SETUP AND TESTING

- A. Field inspection and testing will be performed under provisions of Division 01 – Basic Requirements.
- B. System designer, equipment supplier and installer shall provide all necessary field services to set up remote operation and monitoring system including but not limited to:
  - 1. Aiming of cameras
  - 2. Setups of actuator limit switches.
- C. Acceptance Trial Operation: Demonstrate compliance of the control system using test plans and procedures approved by the engineer and owner to demonstrate all physical and functional requirements of the system for each gate. Document all tests performed and test results

### 3.5 OPERATOR TRAINING

- A. System designer shall provide a minimum of 4 onsite hours of training at each dam for the field and office operators of the complete operation and maintenance of the remote control and monitoring system.

### 3.6 WARRENTY

- A. System designer shall provide a joint and several warranty of all equipment for two years.

### 3.7 SERVICE CONTRACT

- A. System designer shall provide a two year service contract to the owner for the operating system. Cost of the service contract shall be included in the system cost.

**END OF SECTION**