



CITY OF MILWAUKEE

DEPARTMENT OF PUBLIC WORKS

INFRASTRUCTURE SERVICES DIVISION

STREET AND BRIDGES UNIT

STRUCTURAL DESIGN

CONSTRUCTION of
RIVERWALK CONNECTOR BETWEEN
THE RIVER RENAISSANCE AND
MIAD RIVERWALKS

located at

233-236 EAST ERIE STREET

MILWAUKEE, WI

JOB NUMBER : TD03484000

OFFICIAL NOTICE NUMBER : 77

DATE : April 2012

00007/1

CITY OF MILWAUKEE, WISCONSIN
DEPARTMENT OF PUBLIC WORKS
INFRASTRUCTURE SERVICES DIVISION

Specifications

Governing

CONSTRUCTION OF
RIVERWALK CONNECTOR BETWEEN THE RIVER RENAISSANCE AND MIAD
RIVERWALKS

located at

233-239 EAST ERIE STREET

Milwaukee, Wisconsin

Job No. TD03484000

April 2012



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CITY OF MILWAUKEE GENERAL
OFFICIAL NOTICE TO CONTRACTORS

Separate sealed bids for each project will be received until 10:30 a.m. of the bid opening date at which time bids will be publicly opened and read for furnishing all material and doing all work for each project in accordance with the requirements of the respective Official Notice on the bid form furnished in accordance with plans, specifications, contract documents, and proposed form of contract on file in the office of the Department of Public Works, Frank P. Zeidler Municipal Building, Room 506, Milwaukee, Wisconsin 53202.

PROSPECTIVE BIDDERS ARE TO CAREFULLY EXAMINE AND REVIEW ALL CONTRACT DOCUMENTS AND MATERIALS IN SAID OFFICE BEFORE SUBMITTING BID.

Affidavits of No Interest must accompany the bids, and the failure of prospective bidders to comply with these requirements may disqualify the bid.

The Contractor/Lessee agrees to comply with all applicable requirements of the American with Disabilities Act of 1990, 42 U.S.C. Section 12101, Et. Seq. the TDD Number for Public Works is (414) 286-2025.

As a part of the bid each bidder shall submit a full and complete list of all the proposed subcontractors and the class of work to be performed by each, which list shall not be added to nor altered without the written consent of the Commissioner of Public Works.

All Contractors and subcontractors are required to furnish or have on file a certificate of insurance in accordance with the insurance provisions of the General Specifications.

All Contractors and subcontractors are subject to the prevailing wage rates and hours of labor as prescribed by the Common Council of the City of Milwaukee consistent with provisions of Section 66.293 of the Wisconsin Statutes.

Copies of the actual work classifications and wage and fringe benefit rates enforced on this project are available in Room 506 of the Frank P. Zeidler Municipal Building.

Corporate surety will be required on performance and payment bonds for all projects listed in the following Official Notice. All applicable charter and statutory provisions and ordinances, all the provisions of this official notice, invitation to bid, general and detailed specifications, special provisions, proposal, schedule of fixed prices, addendum and plans for this project and all other contract documents set forth in the invitation to bid will be incorporated and made part of the contract as if therein set forth in full.

When there is a tie for the lowest bid, the successful bidder will be decided by the Commissioner of Public Works.

The Commissioner of Public Works reserves the right to reject any or all bids.

CITY OF MILWAUKEE
SPECIFIC OFFICIAL NOTICE NO. 77

Sealed bids will be opened on Thursday, June 7, 2012 at 10:30 A.M. for the CONSTRUCTION OF RIVERWALK CONNECTOR BETWEEN THE RIVER RENAISSANCE AND MIAD RIVERWALKS located at 233-239 East Erie Street, Milwaukee, Wisconsin.

Bid Security Required: Bond, Certified Check, Cashier's Check, or Cash to accompany bid: 10% of Contractor's Base Bid.

Time for Completion: Minimum completion date of November 9, 2012.

Liquated Damages, per diem: \$500.00

THE MINORITY, WOMEN, SMALL BUSINESS ENTERPRISE REQUIREMENT FOR THIS CONTRACT IS 25%. (**Minimum 5.57% African-American, Minimum 0.59% WBE, 18.84% SBE**)

The residency requirement for this project is 40% of all hours worked on the project.

The apprenticeship requirements for this project are: N/A

The contractor shall specifically note the minority, women, small business enterprise, residency, and apprenticeship forms for this project. **If the forms are not filled out properly, it will be cause for rejection of the bid.**

Plans and project manual will be furnished to the prospective bidders upon payment of a \$10.00 non-refundable fee in room 506, Frank P. Zeidler Municipal Building, 841 North Broadway, Milwaukee, Wisconsin 53202. For general questions call 414-286-3314.

A \$10.00 per set additional non-refundable fee is required to obtain bid documents by mail. Plans are sent via U.S mail unless other arrangements are made by the contractor.

Contractor must comply with all provisions of the CITY OF MILWAUKEE GENERAL OFFICIAL NOTICE TO CONTRACTORS published herein and at <http://www.mpw.net/Pages/bids.html>

INSTRUCTIONS TO BIDDERS

See also Instructions to Bidders in the "General Specifications" of the Department of Public Works, City of Milwaukee, Wisconsin, dated January 31, 1992, and all subsequent revisions. The current version of the General Specifications can be found at http://mpw.milwaukee.gov/services/bids_home.

BID FORM

Submit a lump sum price for the project and a unit price for each item of work as indicated on the drawings and specified herein, complete in every respect. Bids will not be accepted in any form except on the bid form included with these specifications.

The Contractor must recognize and abide by the right of the Owner (City of Milwaukee) to accept or reject any or all bids in the best interests of the City.

CONTRACT AWARD

In case of discrepancy between the total Base Bid indicated in the proposal and that obtained by adding the products of the quantities of work and the unit prices, the unit prices shall govern. Any errors found in the total Base Bid indicated will be corrected, and the contract award shall be made to the lowest responsible bidder based on the corrected total Base Bid. The Commissioner of Public Works will award the contract based on the Base Bid only.

CONTRACT BREAKDOWN

Shortly after the award of the contract, each Contractor shall submit a list showing the cost breakdown of the items in his contract. This list will be used as a basis for estimates of work completed for partial payment.

SITE VISIT

All Contractors shall visit the site, consult the drawings and specifications, be familiar with the work of other Contractors and determine for himself all conditions affecting the work.

Failure by a Contractor to be familiar with the project shall not release him from any obligation under this contract to complete the work in strict conformity with the plans and specifications and all City, State and Federal codes or regulations pertaining to the work.

TIME FOR COMPLETION

The time allowed for completion is stated in the Specific Official Notice and shall start with the date on the Notice to Proceed, which will be sent to the Contractor directly following the signing of the contract. The time allowed includes the time required for fabricating and procuring material and doing the work at the site.

SECTION 00700: GENERAL CONDITIONS

1. SCOPE

A. Index:

1. Scope
2. DPW General Specifications
3. Definitions
4. Control of Work and Materials
5. Samples and Tests
6. Project Coordination
7. Supervision of Work
8. Technical Specifications and Drawings
9. Safety Regulations
10. Code Rules

2. DEPARTMENT OF PUBLIC WORKS GENERAL SPECIFICATIONS:

Provisions of the Department of Public Works General Specifications dated January 31, 1992, and revisions through February 2012, shall apply to all contractors and subcontractors working on the project. Copies of the General Specifications may be obtained from the Department of Public Works General Office, Room 516, Frank P. Zeidler Municipal Building, 841 North Broadway, Milwaukee, Wisconsin.

3. DEFINITIONS:

A. Commissioner: Commissioner of Public Works

B. Division: Infrastructure Services Division.

C. City Engineer: The City Engineer of the Infrastructure Services Division.

D. Project Inspector: The authorized representative of the Commissioner assigned to make detailed inspection of any or all portions of the work and materials thereof.

E. Addenda: Writing or graphic instruments issued prior to the execution of the contract which modify or interpret the bidding documents, including drawings and specifications by additions, deletions, clarifications or corrections. Addenda will become part of the contract documents when the contract is executed.

F. Contract Drawings: Drawings of the work to be done as listed hereafter in the Drawing Schedule.

- G. Base Bid: Amount of money stated in the Bid Form as the sum for which the bidder offers to perform the Work, not including that Work for which Alternative Bids are also submitted.
- H. Alternative: Amount of money stated in the Bid Form to be added to the amount of Base Bid if the corresponding change in project scope or alternative materials and/or methods of construction are accepted.

4. CONTROL OF WORK AND MATERIALS:

- A. Detail and Shop Drawings: Shop drawings and other additional drawings which may be required for each branch of the work shall be prepared by each respective contractor unless otherwise directed by the City Engineer. Prints shall be the same size as contract documents when practical. Prints of each drawing shall be submitted to the City Engineer for approval before proceeding with the work. Changes ordered by the City Engineer shall be made and revised prints submitted as above. The City Engineer's approval of drawing shall not relieve the contractor of responsibility for errors.
- B. Primary Lines and Grades: Will be established in the field by the Contractor based on the information shown on the plans. The contractor shall be responsible for verifying all existing dimensions and elevations prior to starting construction.
- C. Construction Lines and Grades: The contractor must bear sole responsibility for the correct transfer of all construction lines and grades from the primary lines and grade points. He shall take such measurements from existing work as may be necessary to insure the proper construction of his work.
- D. Material Orders and Shipping Statements: The contractor shall furnish to the City Engineer at least two (2) copies of all material orders and shipping statements. Itemized weights of the materials and individual units of finished work shall be shown.
- E. Weighing of Materials and Fabricated Units: The weighing of materials and fabricated when required, shall be done in the presence of the Commissioner's representative. The contractor shall be responsible for the satisfactory weighing of such materials and units.
- F. Consignment and Delivery of Materials: The materials for the work shall be consigned to the contractor and he shall be responsible for the delivery of all materials required for the completion of the contract.

5. SAMPLES AND TESTS:

- A. Method of Sampling: Samples of the materials proposed or furnished for the work may be taken by the Commissioner at any time; at the point of manufacture, point of delivery or site of work. They will be selected, as far as practicable, in accordance with standard methods of sampling such materials as specified in the standard of the American Society of Testing Material.

All sampling shall be done by authorized representatives of the Commissioner. Selections will be in an orderly and systematic manner, insuring samples representative of the lot.

- B. A.S.T.M. Standards: Wherever the abbreviation A.S.T.M. is used in connection with the number of a standard specification, the specification referred to shall be the Standard of American Society for Testing Materials, designated by that number, including all revisions in effect on the date of award of the contract. Should a revised or amended standard be issued by the American Society for Testing Materials which, in the opinion of the Commissioner, conflicts with or causes undesirable changes in the standards referred to herein, the Commissioner reserves the right, by means of addenda to the specifications, to continue under the provisions of the pertinent standard referred to herein.
- C. Cost of Test Specimens and Samples: All test specimens of metals and all samples of non-metals required for tests shall be furnished by the contractor without cost to the City.
- D. Cost of Tests: All tests on test specimens of metals will be made at the expense of the contractor and the original test on samples of non-metals will be made at the expense of the City. In all cases, the testing procedure will be in accordance with Standard A.S.T.M. tests for such materials. Subsequent tests of non-metals requested by the contractor, when such tests are permitted by A.S.T.M. Specifications and approved by the Commissioner or subsequent tests ordered by the Commissioner will be made at the expense of the contractor.

6. PROJECT COORDINATION:

- A. Contractors are required, so far as possible, to arrange work and to dispose of materials so as not to interfere with the work or storage of materials of other contractors or City forces engaged upon the work.
- B. Contractor shall give full cooperation to other trades and furnish any information necessary to permit the work of all trades to be installed satisfactorily and with the least possible interference or delay.

- C. Where the work of a contractor will be installed in close proximity to the work of other trades, or where there is evidence that the work of a contractor will interfere with the work of other trades, he shall assist in working out space conditions to make satisfactory adjustments.
- D. If a contractor installs work before coordinating it with other trades or so as to cause interference with work of other trades, he shall make necessary changes in his work to correct the condition without extra charge.
- E. Contractors are required to join their work to that of others in a proper manner, and in accordance with the spirit of the plans and specifications, and to perform the work in the proper sequence in relation to that of other contractors, and as may be directed by the Project Inspector.

7. SUPERVISION OF WORK

- A. Contractors shall furnish the services of an experienced engineer or superintendent.
- B. He shall be constantly in charge of the installation of the work together with all subcontractors, skilled workmen, helpers, and labor required to unload, transfer, erect, connect up, adjust, start, operate and test each system.
- C. He shall be thoroughly acquainted with and be responsible for the various subcontractors' work so that it is properly coordinated and supervised to the satisfaction of the Commissioner of Public Works or his representative.
- D. Upon written notice to a contractor of the lack of such coordination and supervision, the Commissioner of Public Works may authorize such services as may be required and deduct the cost of this service at an hourly rate of \$75.00 per hour per man from the contract for the work.

8. TECHNICAL SPECIFICATIONS AND DRAWINGS:

- A. All contractors shall have complete sets of plans and specifications on the job site at all times.
- B. Anything mentioned in the Technical Specifications and not shown on the Drawings or shown on the Drawings and not mentioned in the Technical Specifications, shall be as if shown on or mentioned in both. In case of difference between Drawings and Technical Specifications, the Technical Specifications shall govern. In case of any discrepancy in drawings or Technical Specifications, the matter shall be immediately submitted to the Division for decision. Said discrepancy shall not be adjusted by the contractor.

9. SAFETY REGULATIONS:

All work shall be done in accordance with the safety requirements set up by the Wisconsin Administrative Code Rules of the Department of Industry, Labor and Human Relations and OSHA.

10. CODE RULES:

The rulings, regulations and laws of the following shall be complied with in the completion of this project:

Wisconsin Administrative Code

Department of Industry, Labor and Human Relations

Plumbing and Drainage Codes of the City of Milwaukee

City of Milwaukee Building Codes

Ordinances of the City of Milwaukee

SECTION 00821: INSPECTION CHARGES

The project will be performed in one phase. The Contractor will be charged a fee for inspection for each and every day such inspection is required after the time allowed for completion has expired.

The amount of the fee for inspection shall be \$350.00 per day.

The time allowed for completion is stated in the Specific Official Notice and shall start with the date on the Notice to Proceed, which will be sent to the Contractor directly following the signing of the contract. The time allowed includes the time required for fabricating and procuring material and doing the work at the site.

MINIMUM WAGE SCALE

RESOLVED, By the Common Council of the City of Milwaukee, that building and construction trades workers in the construction industry employed upon public work projects done by contract for the City of Milwaukee, either new construction or repair work, upon any roads, bridges, sewers, streets, alleys, buildings, or any other public work, shall be paid no less than the hourly wage rates and fringe benefits which prevail in the Milwaukee metropolitan area for the same type of work or for closely related work. (FILE NUMBER 68-1317)

Prevailing hours of labor for all classes of laborers and mechanics means no more than ten (10) hours per day nor more than forty (40) hours per week and may not include any hours worked on a Saturday, Sunday, or one of six holidays. ALL work performed in excess of these prevailing hours must be paid at a rate of at least 1-1/2 times the hourly basis rate of pay (plus fringe benefits). *Fringe Benefits must be paid on ALL hours worked for ALL job classifications.*

If a contractor or subcontractor anticipates employing a person or persons in classifications, trades, or occupations that are not set forth in the Minimum Wage Scale, then that contractor or subcontractor is required to apply to the Commissioner of Public Works PRIOR to the bid opening date set forth in the official notice for the project for a special wage determination containing the classification(s) and associated wage and benefit rate(s). Special wage determinations requested after the bid opening date MAY be issued at the discretion of the Commissioner of Public Works' Office if it is satisfied that a special classification is used as a prevailing practice in the City of Milwaukee.

The Prime Contractor must provide each subcontractor with a copy of the Minimum Wage Scale with the appropriate classifications and rates for the type of work to be performed. The Minimum Wage Scale, including this cover sheet, must be physically included in the subcontract agreement between the prime and subcontractor.

Bidders are required to utilize the Wisconsin Department of Workforce Development's "Dictionary of Occupational Classifications and Work Descriptions" to determine the appropriate job classifications/wage rates for their employees prior to bidding and to insure employees are paid for those job duties they actually perform. This document can be found on their website at dwd.wisconsin.gov; type "dictionary" in the search box. All disputes and/or controversies regarding the proper classification of any laborer, worker, or mechanic employed on a City project will be referred to the State of Wisconsin Department of Workforce Development for final resolution and disposition.

ss. 66.0903(8), Wis. Stats.

Any contractor, subcontractor, or agent thereof, who fails to pay the prevailing rate of wages determined by the department under this subsection or pays less than 1-1/2 times the hourly basic rate of pay for all hours worked on the project in excess of prevailing hours of labor determined under this subsection, shall be liable to the employees affected in the amount of their unpaid minimum wages or their unpaid overtime compensation and an additional amount as liquidated damages.

Each contractor, subcontractor, or agent thereof participating in a project covered by this subsection shall keep full and accurate records clearly indicating the name and trade or occupation of every laborer, workman, or mechanic employed by him in connection with the project and an accurate record of the number of hours worked by each employee and actual wages paid therefor.

**NOTICE TO ALL CONTRACTORS AND
SUBCONTRACTORS:**

**EFFECTIVE 1/1/2010, DUE TO CHANGES IN
WISCONSIN PREVAILING WAGE LAW, SEC.
66.0903 -**

**IN ADDITION TO THE PREVAILING WAGE
REPORTING REQUIREMENTS ALREADY IN
PLACE FOR CITY OF MILWAUKEE DPW
CONTRACTS:**

ALL CONTRACTORS AND SUBCONTRACTORS
ON A PREVAILING WAGE PROJECT ARE ALSO
REQUIRED TO FILE CERTIFIED PAYROLLS OR
COLLECTIVE BARGAINING AGREEMENTS
ELECTRONICALLY WITH THE STATE OF
WISCONSIN DEPARTMENT OF WORKFORCE
DEVELOPMENT (DWD)

INSTRUCTIONS AND FURTHER DETAILS CAN BE
FOUND ON THE DWD'S WEBSITE EXPLAINING THE
REQUIREMENTS

http://dwd.wisconsin.gov/er/prevailing_wage_rate/default.htm

00822/3
PREVAILING WAGE RATE DETERMINATION
 Issued by the State of Wisconsin
 Department of Workforce Development
 Pursuant to s. 66.0903, Wis. Stats.
 Issued On: 01/13/2012
 Amended On: 03/02/2012

DETERMINATION NUMBER: 201200107

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

PROJECT NAME: ALL PUBLIC WORKS PROJECTS UNDER SEC. 66.0903, STATS.-CITY OF MILWAUKEE

PROJECT LOCATION: MILWAUKEE CITY, MILWAUKEE COUNTY, WI

CONTRACTING AGENCY: CITY OF MILWAUKEE-DEPT OF PUBLIC WORKS

CLASSIFICATION:	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: dwd.wisconsin.gov/er/prevailing_wage_rate/Dictionary/dictionary_main.htm .
OVERTIME:	<p>Time and one-half must be paid for all hours worked:</p> <ul style="list-style-type: none"> - over 10 hours per day on prevailing wage projects - over 40 hours per calendar week - Saturday and Sunday - 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; - The day before if January 1, July 4 or December 25 falls on a Saturday; - The day following if January 1, July 4 or December 25 falls on a Sunday. <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>
FUTURE INCREASE:	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.
PREMIUM PAY:	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.
DOT PREMIUM:	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.
APPRENTICES:	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.
SUBJOURNEY:	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.

BUILDING OR HEAVY CONSTRUCTION

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.

SKILLED TRADES

<u>CODE</u>	<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u> \$	<u>HOURLY FRINGE BENEFITS</u> \$	<u>TOTAL</u> \$
Fringe Benefits Must Be Paid On <u>All</u> Hours Worked				
101	Acoustic Ceiling Tile Installer	33.43	19.31	52.74
102	Boilermaker	31.09	21.87	52.96
103	Bricklayer, Blocklayer or Stonemason Future Increase(s): Add \$.50 on 6/01/2012; Add \$1.45/hr on 6/01/2013 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.	35.58	16.37	51.95
104	Cabinet Installer	29.06	15.16	44.22
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
106	Carpet Layer or Soft Floor Coverer	31.68	18.55	50.23
107	Cement Finisher	30.87	16.33	47.20
108	Drywall Taper or Finisher Future Increase(s): Add \$2.20/hr on 6/1/2012	28.97	17.74	46.71
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
110	Elevator Constructor	43.79	25.48	69.27
111	Fence Erector	27.00	0.00	27.00
112	Fire Sprinkler Fitter	36.82	19.03	55.85
113	Glazier	32.25	16.20	48.45
114	Heat or Frost Insulator	33.28	22.45	55.73

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
115	Insulator (Batt or Blown)	23.62	11.55	35.17
116	Ironworker	31.31	21.54	52.85
117	Lather	31.68	18.41	50.09
118	Line Constructor (Electrical)	35.97	18.08	54.05
119	Marble Finisher	31.16	16.27	47.43
120	Marble Mason	35.53	15.92	51.45
121	Metal Building Erector	21.05	7.82	28.87
122	Millwright	28.30	23.29	51.59
123	Overhead Door Installer	26.53	0.00	26.53
124	Painter Future Increase(s): Add \$2.20/hr on 6/1/2012. Premium Increase(s): Add \$.20/hr for paperhanging; Add \$.35/hr for bridge, iron and drywall; Add \$.75/hr for spraying and sandblasting; Add \$.60/hr for EIFS work; Add \$1.00/hr for lead based paint removal.	28.97	17.74	46.71
125	Pavement Marking Operator	26.00	0.00	26.00
126	Piledriver	28.11	23.94	52.05
127	Pipeline Fuser or Welder (Gas or Utility)	30.52	18.84	49.36
129	Plasterer	20.13	1.03	21.16
130	Plumber	36.97	17.47	54.44
132	Refrigeration Mechanic	37.21	19.04	56.25
133	Roofer or Waterproofor Future Increase(s): Add \$.50/hr. effective 06/01/2012	29.40	15.05	44.45
134	Sheet Metal Worker	37.20	16.37	53.57
135	Steamfitter	38.26	19.49	57.75
137	Teledata Technician or Installer 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.	24.65	15.67	40.32
138	Temperature Control Installer	29.63	19.17	48.80
139	Terrazzo Finisher	18.00	5.35	23.35
140	Terrazzo Mechanic	31.16	16.27	47.43

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
141	Tile Finisher	23.76	16.05	39.81
142	Tile Setter	29.95	15.64	45.59
143	Tuckpointer, Caulker or Cleaner 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.	34.35	15.92	50.27
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
147	Siding Installer	36.60	16.37	52.97
150	Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	27.42	15.10	42.52
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

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
201	Single Axle or Two Axle	32.32	16.75	49.07
203	Three or More Axle 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
204	Articulated, Euclid, Dumptor, Off Road Material Hauler	33.32	17.60	50.92
205	Pavement Marking Vehicle	19.25	10.84	30.09
207	Truck Mechanic	24.91	15.35	40.26

LABORERS

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
301	General Laborer Premium Increase(s): Add \$.11 for mortar mixer, fork lift operator, air and electric equipment and power buggy operators; Add \$.22 for jackhammer operator, certified welder, gunite machineman.	28.82	15.61	44.43
302	Asbestos Abatement Worker	21.58	17.83	39.41
303	Landscaper	12.50	2.20	14.70
310	Gas or Utility Pipeline Laborer (Other Than Sewer and Water)	19.14	15.53	34.67
311	Fiber Optic Laborer (Outside, Other Than Concrete Encased) Premium Increase(s): DOT PREMIUMS: Pay two times the hourly basic rate on New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	17.24	15.00	32.24
314	Railroad Track Laborer	17.00	1.06	18.06

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

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
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).	32.32	18.18	50.50
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).	33.32	17.60	50.92

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
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.	32.32	17.59	49.91
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
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**

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
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. Premium Increase(s): Crane Operators with CCO certification add \$.50/hr. Cranes with boom length over 200 ft. not exceeding 300 ft. OR lifting capacity over 200 ton not exceeding 300 ton add \$.50/hr. Over 300 ton OR 300 ft. add \$.01/hr. per foot OR ton whichever is greater.	39.16	19.10	58.26

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked				
CODE	TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
		\$	\$	\$
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). Premium Increase(s): Crane Operators with CCO certification add \$.50/hr.	38.66	19.10	57.76
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). Premium Increase(s): Crane Operators with CCO certification add \$.50/hr.	38.16	19.10	57.26
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). Premium Increase(s): Crane Operators with CCO certification add \$.50/hr.	38.16	19.10	57.26
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.	37.47	19.10	56.57

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
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.	30.44	19.10	49.54
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).	31.26	17.40	48.66
516	Fiber Optic Cable Equipment	25.74	15.85	41.59

SEWER, WATER OR TUNNEL CONSTRUCTION
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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).

SKILLED TRADES

CODE	TRADE OR OCCUPATION	Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		
		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
		\$	\$	\$
103	Bricklayer, Blocklayer or Stonemason	35.53	15.92	51.45
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.	27.14	19.22	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	27.00	0.00	27.00
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	28.11	23.94	52.05
130	Plumber	36.18	16.86	53.04
135	Steamfitter	35.81	19.04	54.85
137	Teledata Technician or Installer	24.65	15.17	39.82

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
143	Tuckpointer, Caulker or Cleaner	34.30	15.47	49.77
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	27.42	15.10	42.52
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

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
201	Single Axle or Two Axle	23.00	8.64	31.64
203	Three or More Axle	17.54	13.41	30.95
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	17.54	13.41	30.95

LABORERS

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
301	General Laborer Future Increase(s): Add \$1.73/hr on 6/4/2012. Premium Increase(s): Add \$1.92 for bottomman; Add \$2.03 for concrete manhole builder, bracer, jointman, or pipelayer; Add \$4.83 for blaster. Add \$2.00 for all tunnel work under 15 lbs. compressed air; Add \$2.00 for 0-30 lbs. compressed air; Add \$3.00 for over 30 lbs. compressed air.	27.72	15.61	43.33

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
303	Landscaper	12.50	2.20	14.70
304	Flagperson or Traffic Control Person	22.50	12.90	35.40
311	Fiber Optic Laborer (Outside, Other Than Concrete Encased)	17.09	14.40	31.49
314	Railroad Track Laborer	17.00	1.06	18.06

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

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
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. Premium Increase(s): Crane Operators with CCO certification add \$.50/hr. Cranes with boom length over 200 ft. not exceeding 300 ft. OR lifting capacity over 200 ton not exceeding 300 ton add \$.50/hr. Over 300 ton OR 300 ft. add \$.01/hr. per foot OR ton whichever is greater.	39.16	19.10	58.26
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 \$2.05/hr on 6/4/2012. Premium Increase(s): Add \$.25/hr for operating tower crane.	33.91	18.55	52.46

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
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 \$2.05/hr on 6/4/2012. Premium Increase(s): Add \$.25/hr for operating tower crane.	32.96	18.55	51.51
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	18.12	49.01
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 \$2.05/hr on 6/4/2012. Premium Increase(s): Add \$.25/hr for operating tower crane.	30.51	18.55	49.06
526	Boiler (Temporary Heat); Forklift; Greaser; Oiler.	29.44	18.10	47.54
527	Work Performed on the Great Lakes Including Diver; Wet Tender or Hydraulic Dredge Engineer.	36.20	18.81	55.01

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
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
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

AIRPORT PAVEMENT OR STATE HIGHWAY CONSTRUCTION

Includes all airport projects (excluding buildings) and all projects awarded by the Wisconsin Department of Transportation (excluding buildings).

SKILLED TRADES

CODE	TRADE OR OCCUPATION	Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		
		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
		\$	\$	\$
103	Bricklayer, Blocklayer or Stonemason	32.66	15.92	48.58
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.	29.33	17.03	46.36
109	Electrician	31.64	23.78	55.42
111	Fence Erector	35.62	0.00	35.62
116	Ironworker	31.31	21.54	52.85
118	Line Constructor (Electrical)	35.97	18.08	54.05
124	Painter	27.87	14.39	42.26
125	Pavement Marking Operator	27.87	14.39	42.26
126	Piledriver Premium Increase(s): Add \$.65/hr for Piledriver Loftsmen; Add \$.75/hr for Sheet Piling Loftsmen. 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.	29.56	24.96	54.52
133	Rofer or Waterproofer	28.85	14.60	43.45
137	Teledata Technician or Installer	24.65	15.17	39.82
143	Tuckpointer, Caulker or Cleaner	34.30	15.47	49.77
144	Underwater Diver (Except on Great Lakes)	36.20	18.81	55.01

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
150	Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	33.87	16.10	49.97
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

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
201	Single Axle or Two Axle 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.	22.35	16.19	38.54
203	Three or More Axle	24.91	15.63	40.54
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	23.84	14.70	38.54
206	Shadow or Pilot Vehicle	24.76	15.35	40.11
207	Truck Mechanic	24.91	15.63	40.54

LABORERS

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
301	General Laborer Future Increase(s): Add \$1.60/hr on 6/1/2012; Add \$1.70/hr on 6/1/2013; Add \$1.60/hr on 6/1/2014. Premium Increase(s): Add \$.15/hr for air tool operator, joint sawer and filler (pavement), vibrator or tamper operator (mechanical hand operated), chain saw operator and demolition burning torch laborer; Add \$.35/hr for bituminous worker (raker and luteman), formsetter (curb, sidewalk and pavement) and strike off man; Add \$.50/hr for line and grade specialist; Add \$.65/hr for blaster and powderman; Add \$2.01/hr for topman; Add \$2.46/hr for bottomman; Add \$3.23/hr for pipelayer. / 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).	24.34	17.85	42.19
302	Asbestos Abatement Worker	22.00	16.86	38.86
303	Landscaper	23.71	15.03	38.74
304	Flagperson or Traffic Control Person Future Increase(s): Add \$1.60/hr on 6/1/2012; Add \$1.70/hr on 6/1/2013; Add \$1.60/hr on 6/1/2014. 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 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.	20.83	17.85	38.68
311	Fiber Optic Laborer (Outside, Other Than Concrete Encased)	17.09	14.40	31.49
314	Railroad Track Laborer	17.00	1.06	18.06

**HEAVY EQUIPMENT OPERATORS
AIRPORT PAVEMENT OR STATE HIGHWAY CONSTRUCTION**

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
531	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; Traveling Crane (Bridge Type). 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).	34.22	18.90	53.12
532	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 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); 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 <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
533	<p>Air Track, Rotary or Percussion Drilling Machine &/or Hammers, Blaster; Asphalt Heater, Planer & Scarifier; Asphalt Milling Machine; Asphalt Screed; Automatic Subgrader (Concrete); 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; Boatmen (NOT Performing Work on the Great Lakes); 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 & Gutter Machine; Concrete Spreader & Distributor; Crane (Carry Deck, Mini) or Truck Mounted Hydraulic Crane (10 Tons or Under); Crane Wlth 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); Material or Stack Hoist; Mechanic or Welder; Milling Machine; Post Hole Digger or Driver; 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); 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 & 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 & 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

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
534	<p>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 (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; Tining or Curing Machine.</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 & 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>	32.96	18.90	51.86
535	<p>Air Compressor (&/or 400 CFM or Over); Air, Electric or Hydraulic Jacking System; Augers (Vertical & Horizontal); 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.</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 & 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>	32.67	18.90	51.57
536	Fiber Optic Cable Equipment.	24.39	15.45	39.84
537	Work Performed on the Great Lakes Including Diver; Wet Tender or Hydraulic Dredge Engineer.	36.20	18.81	55.01

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
538	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
539	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
540	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

LOCAL STREET OR MISCELLANEOUS PAVING CONSTRUCTION
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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).

SKILLED TRADES

CODE	TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
		\$	\$	\$
103	Bricklayer, Blocklayer or Stonemason	35.53	15.92	51.45
105	Carpenter	29.06	15.16	44.22
107	Cement Finisher	27.57	16.33	43.90
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	27.00	0.00	27.00
116	Ironworker	31.31	21.54	52.85
118	Line Constructor (Electrical)	35.97	18.08	54.05
124	Painter	28.47	16.74	45.21
125	Pavement Marking Operator	26.00	0.00	26.00
126	Piledriver	28.11	23.94	52.05
133	Rofer or Waterproofer	28.85	14.60	43.45
137	Teledata Technician or Installer	24.65	15.17	39.82
143	Tuckpointer, Caulker or Cleaner	34.30	15.47	49.77
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
151	Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY	28.78	14.42	43.20
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

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
201	Single Axle or Two Axle	15.00	0.00	15.00
203	Three or More Axle	20.00	6.00	26.00
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	20.00	6.00	26.00

LABORERS

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
301	General Laborer	21.73	17.04	38.77
303	Landscaper	22.96	15.37	38.33
304	Flagperson or Traffic Control Person Future Increase(s): Add \$1.60/hr on 6/1/2012; Add \$1.70/hr on 6/1/2013; Add \$1.60/hr on 6/1/2014. 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 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.	23.55	13.45	37.00
311	Fiber Optic Laborer (Outside, Other Than Concrete Encased)	17.09	14.40	31.49
314	Railroad Track Laborer	17.00	1.06	18.06

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

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> \$
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 &/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 & 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. & 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.</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 & 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 <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
543	Air Track, Rotary or Percussion Drilling Machine &/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. & 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 & Gutter Machine; Concrete Spreader & 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 & A-Frames.	31.89	18.22	50.11
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

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
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.	24.39	15.45	39.84
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**

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
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.	38.06	18.10	56.16

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
552	<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. & 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.</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 & 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
553	<p>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.</p>	31.52	17.50	49.02

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
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. 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
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.	24.39	15.45	39.84

RESIDENTIAL OR AGRICULTURAL CONSTRUCTION

Includes single family houses or apartment buildings of no more than four (4) stories in height and all buildings, structures or facilities that are primarily used for agricultural or farming purposes, excluding commercial buildings. For classification purposes, the exterior height of a residential building, in terms of stories, is the primary consideration. All incidental items such as site work, driveways, parking lots, private sidewalks, private septic systems or sewer and water laterals connected to a public system and swimming pools are included within this definition. Residential buildings of five (5) stories and above are NOT included within this definition.

SKILLED TRADES

<u>CODE</u>	<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
		\$	\$	\$
101	Acoustic Ceiling Tile Installer	27.00	1.16	28.16
102	Boilermaker	31.09	21.87	52.96
103	Bricklayer, Blocklayer or Stonemason	26.22	13.80	40.02
104	Cabinet Installer	26.00	2.33	28.33
105	Carpenter	31.68	7.03	38.71
106	Carpet Layer or Soft Floor Coverer	21.40	6.01	27.41
107	Cement Finisher	28.00	10.10	38.10
108	Drywall Taper or Finisher Future Increase(s): Add \$2.20/hr on 6/1/2012	28.97	17.74	46.71
109	Electrician	31.10	6.01	37.11
110	Elevator Constructor	43.79	25.48	69.27
111	Fence Erector	17.64	4.66	22.30
112	Fire Sprinkler Fitter	36.39	16.97	53.36
113	Glazier	36.23	8.04	44.27
114	Heat or Frost Insulator	29.04	19.73	48.77
115	Insulator (Batt or Blown)	11.00	2.51	13.51
116	Ironworker	23.05	4.06	27.11
117	Lather	28.15	15.14	43.29
119	Marble Finisher	31.16	16.27	47.43
120	Marble Mason	35.53	15.92	51.45
121	Metal Building Erector	15.19	2.00	17.19
123	Overhead Door Installer	23.00	8.00	31.00
124	Painter	23.00	2.81	25.81

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
125	Pavement Marking Operator	26.00	0.00	26.00
129	Plasterer	30.36	7.15	37.51
130	Plumber	37.42	17.92	55.34
132	Refrigeration Mechanic	25.00	0.51	25.51
133	Rofer or Waterproofor Future Increase(s): Add \$.50/hr. effective 06/01/2012	29.40	15.05	44.45
134	Sheet Metal Worker	28.15	15.14	43.29
135	Steamfitter	32.59	11.05	43.64
137	Teledata Technician or Installer	19.23	5.32	24.55
138	Temperature Control Installer	22.00	2.64	24.64
139	Terrazzo Finisher	18.00	5.35	23.35
140	Terrazzo Mechanic	31.16	16.27	47.43
141	Tile Finisher	23.96	15.50	39.46
142	Tile Setter	27.00	1.91	28.91
143	Tuckpointer, Caulker or Cleaner	32.50	1.62	34.12
146	Well Driller or Pump Installer	27.60	0.00	27.60
147	Siding Installer	16.00	0.00	16.00

TRUCK DRIVERS

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
201	Single Axle or Two Axle	16.25	2.25	18.50
203	Three or More Axle	17.00	7.63	24.63
205	Pavement Marking Vehicle	19.25	10.84	30.09
207	Truck Mechanic	19.00	1.75	20.75

LABORERS

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
301	General Laborer	17.50	6.16	23.66
302	Asbestos Abatement Worker	17.00	2.21	19.21
303	Landscaper	11.00	2.07	13.07
311	Fiber Optic Laborer (Outside, Other Than Concrete Encased)	17.09	14.40	31.49

**HEAVY EQUIPMENT OPERATORS
RESIDENTIAL OR AGRICULTURAL CONSTRUCTION**

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
557	Asphalt Heater, Planer & Scarifier; Asphalt Milling Machine; Asphalt Screed; Backhoe (Track Type); 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 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 & Gutter Machine; Concrete Spreader & Distributor; Crane (Carry Deck, Mini) or Truck Mounted Hydraulic Crane (10 Tons or Under); Crane With a Lifting Capacity of 25 Tons or Under; Crane, Shovel, Dragline, Clamshells; Forestry Equipment, Timberco, Tree Shear, Tub Grinder, Processor; 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; Roller (Over 5 Ton); Scraper (Self Propelled or Tractor Drawn) 5 cu yds or More Capacity; Shoulder Widener; Skid Rig; Stabilizing or Concrete Mixer (Self-Propelled or 14S or Over); 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); Winches & A-Frames.	32.56	10.76	43.32
558	Air Compressor (&/or 400 CFM or Over); Air, Electric or Hydraulic Jacking System; Backfiller; Belting, Burlap, Texturing Machine; Boiler (Temporary Heat); Broom or Sweeper; Compactor (Self-Propelled or Tractor Mounted, Towed & Light Equipment); Concrete Finishing Machine (Road Type); Farm or Industrial Type Tractor; Forklift; Generator (&/or 150 KW or Over); Heaters (Mechanical); High Pressure Utility Locating Machine (Daylighting Machine); Jeep Digger; Lift Slab Machine; Mulcher; Oiler; Post Hole Digger or Driver; Power Subgrader; Pump (3 Inch or Over) or Well Points; Robotic Tool Carrier (With or Without Attachments); Rock, Stone Breaker; Roller (Rubber Tire, 5 Tons or Under); Screed (Milling Machine); Self Propelled Chip Spreader; Shouldering Machine; Skid Steer Loader (With or Without Attachments); Stump Chipper; Telehandler; Vibratory Hammer or Extractor, Power Pack.	17.40	0.44	17.84

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

SECTION 00823: PARTIAL PAYMENTS FOR STORED MATERIALS

As stated in the General Conditions, the Commissioner of Public Works may grant an estimate of the amount of properly stored fabricated or manufactured materials and components specified, previously paid for by the Contractor. Said payments will be made in accordance with "Procedure Rules of the Commissioner of Public Works for Progress Estimates".

For inspection of properly stored materials located outside Milwaukee County, the City shall be reimbursed by the Contractor for all transportation costs, travel time wages, overtime and incidental expenses for City employees performing said inspection.

SECTION 00851: DRAWING SCHEDULE

The following listed drawings accompany and form a part of the Project Contract Documents along with these specifications and generally illustrate the nature of the work.

<u>SHEET NO.</u>	<u>TITLE</u>
1	TITLE SHEET
2	SITEPLAN
3	PLAN & ELEVATION
4	TYPICAL SECTION
5	BRACING DETAILS
6	SECTIONS
7	SECTIONS & DETAILS (GRID LINE A)
8	SECTIONS & DETAILS (GRID LINE B)
9	RAILING (1 OF 2)
10	RAILING (2 OF 2)

SECTION 00870: SUBMITTALS/PERMITS

1. SCOPE

A. Index

1. Scope
2. Submittals and Samples
3. Change Orders
4. Construction Schedule
5. Permits and Codes

2. SUBMITTALS AND SAMPLES

A. Comply with the requirements of the General Conditions and as follows:

1. Forward submittals not more than 30 calendar days after the Award of Contract for all materials to be used on the project. No work, indicated on any one shop drawing, hardware list, etc., shall be started until such information has been approved.
2. Include with each submittal a transmittal letter signed by the Contractor containing the following:
 - a. Name of Contractor
 - b. Name of Project
 - c. List of Submittals
 - d. Name of Manufacturer or Supplier
 - e. Additional information as required for the items being provided.
 - f. Questions on the plans and project specifications during the contract bidding phase shall be directed to:

James Washington
Department of Public Works
Room 907, Frank P. Zeidler Municipal Building
841 North Broadway
Milwaukee, Wisconsin 53202
(414) 286-5595
James.M.Washington@milwaukee.gov

3. All correspondence including payment requests (4 copies), change order proposals, construction time letters (delays, suspensions), and any construction related matters shall be sent to the City's Construction Supervisor, who will be assigned at the pre-construction meeting.

All correspondence concerning the following items:
Emerging Business Enterprises Reports, Residency Preference Program,
Apprentice Program, Wage and Hour Reports, Insurance Certificates,
Subcontractor Approval Forms, and all affidavits should be sent to:

Ms. Barbara Tribble
Department of Public Works
Room 507, Frank P. Zeidler Municipal Building 841 North Broadway
Milwaukee, Wisconsin 53202
(414) 286-3309

- B. Approvals: Wherever the words "or equal", or "approved equal" or similar terms are used, it shall mean as approved by the Commissioner of Public Works or agent. All Shop drawings, bulletins, manufacturers cut sheets and data necessary for an approval shall be submitted with six (6) copies sent to the City. Three (3) copies are required for the City's use, one (1) copy for the Consultant's use, and two (2) copies will be returned to the Contractor.

Approval shall apply to general conformance only, and shall in no way relieve the Contractor from his/her responsibility for the full performance of contract. Evaluation of "or equal" products will be made at the time of shop drawing submission.

C. Shop Drawings and Submittals

The Contractor shall submit six (6) copies of the submittals listed in the various specification sections. Shop drawings and submittals shall be sent to the City's Construction Supervisor, who will be assigned at the pre-construction meeting.

The City and the City's consultant will initially review the submittals. The City Engineer will distribute reviewed submittals to the Contractor.

3. CHANGE ORDERS

- A. Change orders shall be requested and processed in accordance with DPW General Specifications, Chapter 2.0.6 and as herein specified. The Contractor shall submit all change order requests to the City in a timely manner. Each request should include a description of the proposed change, the reason for the change and a complete breakdown of the proposed cost including labor and material costs.
- B. The Contractor shall include with the change order request the impact, if any, the proposed change will have on the Contractor's schedule. If a time extension to the schedule is requested, then the Contractor shall include supporting information to substantiate the claim.

- C. All change order requests shall be submitted as soon as possible after the above information can be compiled. Change order requests submitted after one month of occurrence may not be granted.
- D. Change orders requested to be paid on a time and material basis shall have all work documented on a daily basis. Contractor's superintendent and City inspector shall sign off on a daily basis all labor hours and materials used and charged to the change orders.
- E. Approval of the change order work and method and/or amount of payment shall be approved prior to Contractor proceeding with change order work as outlined in the DPW General Specification.

4. CONSTRUCTION SCHEDULE

The Contractor shall submit a construction schedule at the Pre-Construction Meeting, which will include all of the Contractor's work and all the work of the subcontractors. Copies of this schedule shall be submitted to the City for their review. The construction schedule shall include the following:

- A. Listing of starting and completion dates for each task of the project.
- B. Running schedule of a week-by-week charting and allowing for the charting of:
 - 1. Expected progress on major items.
 - 2. Actual progress on major items.
- C. The Contractor shall submit an updated schedule at each project meeting.

5. PERMITS AND CODES:

The contractor shall obtain and pay for all permits, charges, fees and licenses, if any are necessary, for the prosecution of the work.

A permit has been obtained for this project from the Wisconsin Department of Natural Resources. The contractor shall abide by the permit conditions. A complete copy of the permit is available from the City of Milwaukee. The contractor must abide by the following permit conditions.

1. Construction shall be accomplished in such a manner as to minimize erosion and siltation into surface waters and as specified in the plans and procedures that are part of or approved pursuant to this permit. All erosion control measures must meet or exceed the approved Stormwater Construction Technical Standards found on the Department's Runoff Management Website <http://dnr.wi.gov/org/water/wm/nps/stormwater/techstds.htm#Construction> developed by the Department under Wis. Admin. Code Ch. NR 151.31.
2. You must not deposit or store any of the removed materials in any wetland or below the ordinary high water mark of any waterway. All removed materials must be placed out of the floodway of any stream.
3. All equipment used for the project including but not limited to tracked vehicles, barges, boats, silt or turbidity curtain, hoses, sheet pile and pumps shall be decontaminated for invasive and exotic viruses and species prior to use and after use.

The following steps should be taken every time you move your equipment to avoid transporting Invasive and exotic viruses and species. To the extent practical, equipment and gear used on infested waters should not be used on other non-infested waters.

- **Inspect and remove** aquatic plants, animals, and mud from your equipment.
 - **Drain all water** from your equipment that comes in contact with infested waters, including but not limited to tracked vehicles, barges, boats, silt or turbidity curtain, hoses, sheet pile and pumps.
 - **Dispose** of aquatic plants, animals, in the trash. Never release or transfer aquatic plants, animals or water from one water body to another.
 - **Wash your equipment** with hot (>104° F) and/or high pressure water OR allow your equipment to **Dry thoroughly for 5 days**.
5. Maintenance activities may not result in the discharge or deposition of materials (for example paint, sand or abrasives, metal or chemicals) into the waterway.
 6. For work under this permit you shall comply with all other state regulations including, but not limited to, Wisconsin Admin. Code NR 116 floodplain zoning, NR 216 Stormwater Management, Solid Waste NR 500-600 series. This permit has not been reviewed for compliance with these regulations, this is your responsibility.

The contractor shall comply with all laws, ordinances, rules and regulations bearing on the conduct of the work including the giving of notices.

Attention is directed to the Milwaukee County Air Pollution Control Ordinances and Department of Natural Resources relative to the specific sections which are applicable to sandblasting.

Any costs incurred to comply with codes and ordinances shall be included in the price bid of the work.

The rulings, regulations and laws of the following shall be complied with in the completion of this project:

Federal Register - Department of Labor, Safety and Health
Regulations for Construction (OSHA)
2007 Wisconsin Enrolled Commercial Building Code, Department
of Commerce
City of Milwaukee Building Code
Ordinances of the City of Milwaukee
National Board of Fire Underwriters

If any material or work is specified contrary to such rules or omitted from the specifications or drawings but required by such rules, same shall be altered as required by the contractor to meet these rules and regulations.

SECTION 01100 - SUMMARY

PART1-GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary. Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Project consists of.

1. Project Location:

233–239 East Erie Street
Milwaukee, Wisconsin 53202

2. Owner's Representative:

City of Milwaukee
Department of Public Works
841 North Broadway
Milwaukee, Wisconsin 53202

- B. Engineer Identification: The Contract Documents, dated December, 2011, were prepared for Project by:

CH2M HILL, INC.
135 South 84th Street, Suite 400
Milwaukee, Wisconsin 53214-1456
Phone: (414) 847-0480
Email: smiller5@ch2m.com
Questions should be addressed to: Steve Miller, PE

- C. The Work consists of:

1. The construction of a pile supported Riverwalk along the north side of the Milwaukee River between the River Renaissance and the MIAD Riverwalks. This scope includes, but is not limited to, piling, tied back sheet pile dockwall, structural steel, wood structures, ironwood decking, decorative steel railings, lighting, asphalt paving, and chain link fencing.

1.3 CONTRACT

- A. Project will be constructed under a lump sum with unit price general construction contract.

1.4 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "MasterFormat" numbering system.

END OF SECTION 01100

SECTION 01270 - UNIT PRICES

PART1-GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for unit prices.
- B. Related Sections include the following:
 - 1. See Invitation to Bid for bid form and submitting unit costs.
 - 2. Division 1 Section 00870 "Change Orders" for procedures for submitting and handling Change Orders.
 - 3. Division 2 Section 02459 "Concrete Filled Steel Piles" for procedures for measurement and payment for driven steel pipe piles.
 - 4. Division 2 Section 02462 "Steel Sheet Piling" for procedures for measurement and payment for steel sheet piling.

1.3 DEFINITIONS

- A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A list of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each

unit price.

PART 2- PRODUCTS (NOT USED)

PART 3- EXECUTION

3.1 LIST OF UNIT PRICES

A. Unit Price No. 1 — Concrete Filled Steel Pipe Piles- Unrestricted:

1. Description: Provide unit price for installing pipe pile according to Division 2 Section 02459 "Concrete Filled Steel Piles."
2. Unit of Measurement: Linear foot of pile. See Section 02459 for additional information regarding pile unit description.
3. Unit length price shall include all splices (yard, field, or other) required to achieve installed length.
4. Unit length price shall be exclusive of pile bracing system. Bracing system shall remain as designed regardless of final installed pile length.

B. Unit Price No. 2 — Steel Sheet Piling-Unrestricted:

1. Description: Provide unit price for installing steel sheet piling according to Division 2 Section 02462 "Steel Sheet Piling".
2. Unit of Measurement: Linear feet of wall. See Section 02462 for additional information regarding sheet pile wall unit description.
3. Unit price shall include all tie-backs and anchor pile wall required to achieve installed length.

END OF SECTION 01270

SECTION 01290 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
 - 1. Division 1 Section 01320 "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
 - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with Continuation Sheets.
 - b. Submittals Schedule.
 - 2. Submit the Schedule of Values to Owner at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 - 3. Subschedules: Where the Work is separated into phases requiring separately phase payments, provide subschedules showing values correlated with each phase of payment.
- B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.
 - b. Owner's project number.
 - c. Contractor's name and address.
 - d. Date of submittal.

2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Change Orders (numbers) that affect value.
 - f. Dollar value.
 - 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.

4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing if required.

6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

7. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

8. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of

actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

9. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Forms: Use AIA Document G702 and AIA Document 6703 Continuation Sheets as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Owner will return incomplete applications without action.
 1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit (5) five signed and notarized original copies of each Application for Payment to Owner by a method ensuring receipt. All copies shall include waivers of lien and similar attachments if required.
 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
 1. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item.
 2. When an application shows completion of an item, submit final or full waivers.

3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of Values.
 3. Initial progress report.
 4. Certificates of insurance and insurance policies.
 5. Performance and payment bonds.
- H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- I. Documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Updated final statement, accounting for final changes to the Contract Sum.
 3. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
 4. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
 5. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 6. Certification of completed punchlist prepared by Owner and/or Engineer.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01290

SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

PART1-GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General project coordination procedures.
 - 2. Conservation and Waste Management.
 - 3. Coordination Drawings.
 - 4. Project meetings.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section 01320 "Construction Progress Documentation" for preparing and submitting the Contractor's Construction Schedule.
 - 2. Division 1 Section 01700 "Execution Requirements" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Division 1 Section 01770 "Closeout Procedures" for coordinating Contract closeout.

1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.

4. It is the responsibility of the contractor, sub-subcontractor, or any other party to review and understand all drawings and specifications as they relate to their own and other work and that require contractor coordination.
5. Construction access and staging may be coordinated with the two property owners.

General Capital Group, owns the west parcel adjacent to the riverwalk. The parking lot is leased to monthly parkers. To coordinate construction of the tied back sheet pile dockwall and other construction activities contact:

Michael Weiss
General Capital Group
6938 North Santa Monica Boulevard
Milwaukee, WI 53217
414-228-3505 office
414-232-0106 cell
414-228-3700 fax
michael@generalcapitalgroup.com

Hoffman Properties Inc. owns the east parcel adjacent to the riverwalk. To coordinated construction activities contact:

Lorraine Hoffman
Hoffman Properties Inc
PO Box 510856
Milwaukee WI, 53217
414-276-6190 office
lhoffco@gmail.com

To coordinate the electrical hook up with MIAD for the riverwalk lights contact:

Mike Goetz
MIAD, Building Manager
Phone: 414-847-3305
Email: mgoetz@miad.edu

- B. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
 2. Preparation of the Schedule of Values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into the Work.
- E. Waste Management Goals: Coordinate construction activities in order to generate the least amount of waste possible.
1. Take steps to ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination or other factors.
 2. Waste material shall be reused, salvaged, or recycled when feasible. Disposal in landfill shall be minimal.
 - a. Waste shall be separated into dumpster containers. Separated material shall include but not be limited to the following:
 - 1) Ferrous metal
 - 2) Non-ferrous metal
 - 3) Wood
 - 4) Organic
 - 5) Paper
 - 6) Non-recyclable
- F. Coordination with Other Work: Contractor shall contact the City of Milwaukee for ongoing Riverwalk construction to coordinate work.

1.4 SUBMITTALS

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
1. Indicate relationship of components shown on separate Shop Drawings.
 2. Indicate required installation sequences.
- B. Staff Names: Within 10 business days of starting construction operations, submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities;

list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1.5 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner of scheduled meeting dates and times.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, within 3 days of the meeting.
- B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Engineer, but no later than 15 business days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
 - 1. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; ALL subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing.
 - d. Procedures for processing Applications for Payment.
 - e. Submittal procedures.
 - f. Use of the premises.
 - g. Responsibility for temporary facilities and controls.
 - h. Parking availability.
 - i. Office, work, and storage areas.
 - j. Equipment deliveries and priorities.
 - k. Security.
 - l. Working hours.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site

before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Owner of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Deliveries.
 - c. Submittals.
 - d. Review of mockups.
 - e. Possible conflicts.
 - f. Time schedules.
 - g. Weather limitations.
 - h. Temporary facilities and controls.
 - i. Space and access limitations.
 - j. Required performance results.
 - k. Protection of construction and personnel.
 3. Record significant conference discussions, agreements, and disagreements.
 4. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct weekly progress meetings at the site including Owner, Contractor and all sub-Contractors. Coordinate dates of meetings with preparation of payment requests.
1. Attendees: In addition to representatives of Owner, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

- b. Review present and future needs of each entity present, including the following:
 - 1) Sequence of operations.
 - 2) Status of submittals.
 - 3) Deliveries.
 - 4) Access.
 - 5) Site utilization.
 - 6) Temporary facilities and controls.
 - 7) Work hours.
 - 8) Change Orders.
 - 9) Documentation of information for payment requests.
3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
 - a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01310

SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

PART1-GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Preliminary Construction Schedule.
 - 2. Contractor's Construction Schedule.
 - 3. Submittals Schedule.
- B. Related Sections include the following:
 - 1. Division 1 Section 01290 "Payment Procedures" for submitting the Schedule of Values.
 - 2. Division 1 Section 01310 "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
 - 3. Division 1 Section 01330 "Submittal Procedures" for submitting schedules and reports.
 - 4. Division 1 Section 01400 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 SUBMITTALS

- A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
 - 1. Scheduled date for first submittal.
 - 2. Specification Section number and title.
 - 3. Submittal category (action or informational).
 - 4. Name of subcontractor.
 - 5. Description of the Work covered.
 - 6. Scheduled date for Owner's final release or approval.
- B. Preliminary Construction Schedule: Submit two printed copies.
- C. Contractor's Construction Schedule: Submit two printed copies of initial schedule,

one a reproducible print and one a blue- or black-line print, large enough to show entire schedule for entire construction period.

1.4 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from parties involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART2-PRODUCTS

2.1 SUBMITTALS SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
 - 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 - 2. Initial Submittal: Submit concurrently with preliminary bar-chart schedule. Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 - a. At Contractor's option, show submittals on the Preliminary Construction Schedule, instead of tabulating them separately.
 - 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- B. Time Frame: Extend schedule from date established for commencement of the Work to date of Final Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- C. Activities: Treat each separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Owner.
 2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - a. Structural Steel
 - b. Heavy Timber members
 - c. Railing
 - d. Sheet Pile Dockwall
 - e. Lighting
 3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 4. Startup and Testing Time: Include not less than 5 days for startup and testing as required.
 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Owner's administrative procedures necessary for certification of Substantial Completion.
- D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Phasing- Arrange list of activities on schedule by phase.
 2. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 1 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 3. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Division 1 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 4. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.

- b. Mockups.
 - c. Fabrication.
 - d. Installation.
 - e. Tests and inspections.
 - f. Startup and placement into final use and operation.
- E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
- F. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.
- 1. Refer to Division 1 Section "Payment Procedures" for cost reporting and payment procedures.
- G. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragments to demonstrate the effect of the proposed change on the overall project schedule.

2.3 PRELIMINARY CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within ten business days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. CPM Schedule: Prepare Contractor's Construction Schedule using a CPM network analysis diagram.
 - 1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 15 business days after date established for the Notice to Proceed.
 - 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 - 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment

- request dates.
4. Use "one workday" as the unit of time.
- C. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Delivery.
 - c. Fabrication.
 - d. Installation.
 2. Processing: Process data to produce output data or a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 3. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- D. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
 2. Description of activity.
 3. Principal events of activity.
 4. Immediate preceding and succeeding activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in workdays.
 8. Total float or slack time.
 9. Average size of workforce.
 10. Dollar value of activity (coordinated with the Schedule of Values).
- E. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.

4. Changes in activity durations in workdays.
 5. Changes in the critical path.
 6. Changes in total float or slack time.
 7. Changes in the Contract Time.
- F. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
 2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
 3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
 4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
 - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
 - b. Submit value summary printouts 3 business days before each regularly scheduled progress meeting.

PART3-EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect and Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post one large format copy in Field Office meeting room and have available smaller copies for sub-contractors, owner, and others.

2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01320

SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.
- B. Related Sections include the following:
 - 1. Division 1 Section 01290 "Payment Procedures" for submitting Applications for Payment.
 - 2. Division 1 Section 01320 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
 - 3. Division 1 Section 01770 "Closeout Procedures" for submitting warranties.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Owners's responsive action.
- B. Informational Submittals: Written information that does not require Owner's approval. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings of the Contract Drawings will be available from the Owner for Contractor's use in preparing submittals.
 - 1. Electronic drawings will be provided for use by the subcontractor, manufacturer, installer, fabricator, etc.
 - 2. Files will be made available in Microstation only. Any inaccuracies, deviations or other errors associated with the conversion of the original files to any other format other than Microstation shall be the responsibility of the receiving party to verify and correct.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Owner reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
 3. Where off-site or in-person submittals are used, notify Owner ten (10) days prior to anticipated date of field review to all for coordination of Owner's and consultant's schedules.
- C. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Owner's receipt of submittal.
1. Initial Review: Allow 10 business days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Owner will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Concurrent Review: Where concurrent review of submittals by Owner's consultant or other parties is required, allow 15 days for initial review of each submittal.
 - a. Structural Steel
 - b. Heavy Timber
 - c. Railing
 - d. Sheet Pile Dockwall
 - e. Lighting
 3. If intermediate submittal is necessary, process it in same manner as initial submittal.
 4. Allow 15 business days for processing each resubmittal.
 5. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
- E. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title

- block.
2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and separate, equally sized area for review markings and action taken by Engineer.
 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Owner.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Unique identifier, including revision number.
 - i. Other necessary identification.
- F. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
- G. Additional Copies: Unless additional copies are required for final submittal, and unless Owner observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.
1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Owner.
 2. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.
- H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Owner will discard submittals received from sources other than Contractor.
1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Owner on previous submittals, and deviations from requirements of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.
 2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
 3. Transmittal Form: Use AIA Document G810 or suitable equal containing similar information.
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors,

suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

- J. Use for Construction: Use only final submittals with mark indicating action taken by Owner and Engineer in connection with construction.

PART 2-PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
1. Number of Copies: Submit six (6) copies of each submittal, unless otherwise indicated. Owner will return two copies. Mark up and retain one returned copy as a Project Record Document.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Shopwork manufacturing instructions.
 - f. Notation of coordination requirements.
 - g. Notation of dimensions established by field measurement.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
 3. Number of Copies: Submit three blue- or black-line prints of each submittal, unless prints are required for operation and maintenance manuals. Submit five prints where prints are required for operation and maintenance manuals. Owner will retain one print; remainder will be returned.
- C. Coordination Drawings: Comply with requirements in Division 1 Section 01310 "Project Management and Coordination."
- D. Samples: Prepare physical units of materials or products, including the following:
1. Comply with requirements in Division 1 Section 01400 "Quality Requirements" for mockups.

2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Owner's sample where so indicated. Attach label on unexposed side that includes the following:
 - a. Generic description of Sample.
 - b. Product name or name of manufacturer.
 - c. Sample source.
5. Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, provide the following:
 - a. Size limitations.
 - b. Compliance with recognized standards.
 - c. Availability.
 - d. Delivery time.
6. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.
 - a. If variation in color, pattern, texture, or other characteristic is inherent in the product represented by a Sample, submit at least three sets of paired units that show approximate limits of the variations.
 - b. Refer to individual Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
7. Number of Samples for Initial Selection: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Owner will return submittal with options selected.
8. Number of Samples for Verification: Submit three sets of Samples. Owner will retain one Sample set; remainder will be returned.

- a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
9. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
- E. Application for Payment: Comply with requirements in Division 1 Section 01290 "Payment Procedures."

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
 1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Owner will not return copies.
 2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 3. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Requirements."
- B. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- C. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.
- D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- E. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

PART 3-EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Owner.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 OWNER'S ACTION

- A. General: Owner, or the Owner's consultant, will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Owner, or the Owner's consultant, will review each submittal, make marks to indicate corrections or modifications required, and return it. Owner, or the Owner's consultant, will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
 1. Reviewed with no comments
 2. Reviewed with comments
 3. Revise and Resubmit
- C. Informational Submittals: Owner, or the Owner's consultant, will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Owner will forward each submittal to appropriate party.
- D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION 01330

SECTION 01400 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections include the following:
 - 1. Division 1 Section 01320 "Construction Progress Documentation" for developing a schedule of required tests and inspections.
 - 2. Division 1 Section 01731 "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
 - 3. Divisions 2 through 16 Sections for specific test and inspection requirements.
 - 4. Divisions 2 through 16 sections for materials and equipment required for mock ups and shop fabrication.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.

- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups are used to verify selections made under Sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Mockups establish the standard by which the Work will be judged.
- D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.4 REGULATORY REQUIREMENTS

- A. Copies of Regulations: Obtain copies of the following regulations and retain at Project site to be available for reference by parties who have a reasonable need:
 - 1. Any rule or regulations pertaining to work involved with project. Included but not limited to the agencies of OSHA, DNR, DOT, EPA, and Coast Guard.

1.5 SUBMITTALS

- A. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Description of test and inspection.
 - 3. Identification of applicable standards.
 - 4. Identification of test and inspection methods.
 - 5. Number of tests and inspections required.
 - 6. Time schedule or time span for tests and inspections.
 - 7. Entity responsible for performing tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this

Project, whose work has resulted in construction with a record of successful in-service performance.

- D. **Manufacturer Qualifications:** A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.
- E. **Professional Engineer Qualifications:** A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those perfolined for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. **Specialists.** Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.
- G. **Testing Agency Qualifications:** An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.
- H. **Mockups:** Mockup shall incorporate all elements associated with a complete segment of this project unless noted otherwise by the Owner. Owner shall identify in writing to the contractor the area selected to be mockup. Contractor shall identify area to erect mockups. Mockup may be incorporated into the final work only with written approval from the Owner.

1.7 QUALITY CONTROL

- A. **Owner Responsibilities:** Unless noted otherwise, Owner will provide independent concrete testing and inspection services.
 - 1. Owner reserves the right to recommend and/or require specific testing or inspection agency's involvement in this project. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
 - 2. Owner reserves the right to require Contractor's testing agency to perform additional testing and inspection work. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. **Contractor Responsibilities:** Unless otherwise directed by Owner, Contractor shall not provide independent testing and inspection service.

- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting,, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.
- E. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - 1. Access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 - 4. Facilities for storage and field-curing of test samples.
 - 5. Delivery of samples to testing agencies.
 - 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 - 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01400

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.
- B. Temporary utilities include, but are not limited to, the following:
 - 1. Electric power service.
 - 2. Lighting.
 - 3. Telephone service.
 - 4. Water service.
- C. Support facilities include, but are not limited to, the following:
 - 1. Temporary roads and paving.
 - 2. Project identification and temporary signs.
 - 3. Waste disposal facilities.
 - 4. Field offices.
 - 5. Storage and fabrication sheds.
- D. Related Sections include the following:
 - 1. Division 1 Section 01330 "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
 - 2. Division 1 Section 01700 "Execution Requirements" for progress cleaning requirements.
 - 3. Division 2 Section 03300 "Concrete" for construction and maintenance of cement concrete pavement for temporary roads and paved areas.
 - 4. Divisions 2 through 16 for temporary heat, ventilation, and humidity requirements for products in those Sections.

1.3 USE CHARGES

- A. General: Cost or use charges for temporary facilities are not chargeable to Owner or Engineer and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the

following:

1. Owner's construction forces.
2. Occupants of Project.
3. Engineer.
4. Testing agencies.
5. Personnel of authorities having jurisdiction.

B. Electric Power Service: Pay electric power service use charges, whether metered or otherwise, for electricity used by all entities engaged in construction activities at Project site.

1.4 SUBMITTALS

A. Implementation and Termination Schedule: Within 15 days of date established for submittal of Contractor's Construction Schedule, submit a schedule indicating implementation and termination of each temporary utility.

1.5 QUALITY ASSURANCE

A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.

1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

A. Temporary Utilities: At earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of permanent service.

1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:

1. Keep temporary services and facilities clean and neat.
2. Relocate temporary services and facilities as required by progress of the Work.

PART 2-PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Owner. Provide materials suitable for use intended.
- B. Pavement: Comply with Division 3.
- C. Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized steel, chain-link fabric fencing; minimum 8 feet high with galvanized steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top rails.
- D. Water: Potable.

2.2 EQUIPMENT

- A. General: Provide equipment suitable for use intended.
- B. Field Offices: Mobile units with lockable entrances, operable windows, and serviceable finishes; heated and air conditioned; on foundations adequate for normal loading.
- C. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- D. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.
- E. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3-EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
 - 2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
 - 3. Obtain easements to bring temporary utilities to Project site where Owner's easements cannot be used for that purpose.

- B. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
 - 1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
 - 2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Provide separate facilities for male and female personnel.

- C. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear.
 - 1. Install power distribution wiring overhead and rise vertically where least exposed to damage.
 - 2. Connect temporary service to Owner's existing power source, as directed by electric company officials.

- D. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.
 - 1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
 - 2. Provide metal conduit enclosures or boxes for wiring devices where situations require.
 - 3. Provide 4-gang outlets, spaced so 100-foot extension cord can reach each area for

- power hand tools and task lighting. Provide a separate 125-V ac, 20-A circuit for each outlet.
- E. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.
1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
 2. Install exterior-yard site lighting that will provide adequate illumination for construction operations, traffic conditions, and signage visibility when the Work is being performed.
- F. Telephone Service: Provide temporary telephone service throughout construction period for common-use facilities used by all personnel engaged in construction activities. Install separate telephone line for each field office and first-aid station.
1. Provide additional telephone lines for the following:
 - a. In field office with more than two occupants, install a telephone for each additional occupant or pair of occupants.
 - b. Provide a dedicated telephone line for each facsimile machine and computer with modem in each field office.
 2. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 3. Provide an answering machine and/or voice-mail service on superintendent's telephone.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
 2. Provide incombustible construction for offices, shops, and sheds located within construction area or within 75 feet of building lines. Comply with NFPA 241.
 3. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
 4. Maintain clear areas required for access by outside parties as indicated on construction documents.

- B. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Division 1 Section 01700 "Execution Requirements" for progress cleaning requirements and Division 1 Section 01505 "Construction Waste Management" for disposal requirements.
1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.
 2. Develop a waste management plan for Work performed on Project. Indicate types of waste materials Project will produce and estimate quantities of each type. Provide detailed information for on-site waste storage and separation of recyclable materials. Provide information on destination of each type of waste material and means to be used to dispose of all waste materials.
- C. Storage and Fabrication Sheds: Provide sheds as required, sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility services. Sheds may be open shelters or fully enclosed spaces within building or elsewhere on-site.

3.4 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 1 Section "Closeout Procedures."

END OF SECTION 01500

SECTION 01700 - EXECUTION REQUIREMENTS

PART1-GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. General installation of products.
 - 4. Starting and adjusting.
 - 5. Protection of installed construction.
 - 6. Correction of the Work.
- B. Related Sections include the following:
 - 1. Division 1 Section 01310 "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
 - 2. Division 1 Section 01330 "Submittal Procedures" for submitting surveys.
 - 3. Division 1 Section 01770 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 SUBMITTALS

- A. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- B. Final Property Survey: Submit 2 copies showing the Work performed and record survey data.

1.4 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

PART2-PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, Contractors and Surveyor shall investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
1. Before construction, verify the location and points of connection of utility services.
- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, Contractors and Surveyor shall investigate and verify the existence and location of underground utilities and other construction affecting the Work.
1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - a. Description of the Work.
 - b. List of detrimental conditions, including substrates.
 - c. List of unacceptable installation tolerances.
 - d. Recommended corrections.
 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 4. Examine walls, and roofs for suitable conditions where products and systems are to be installed.
 5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility(s) that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than 2 days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Owner's written permission.
- C. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- E. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Owner. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on CSI Form 13.2A, "Request for Interpretation."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Owner promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 3. Inform installers of lines and levels to which they must comply.
 - 4. Check the location, level and plumb, of every major element as the Work progresses.

5. Notify Owner when deviations from required lines and levels exceed allowable tolerances.
 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Owner.

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
1. Do not change or relocate existing benchmarks or control points without prior written approval of Owner and Engineer. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Owner and Engineer before proceeding.
 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of three permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

- D. Pile Installation Coordinates: Engage a professional surveyor to provide coordinates (north and east) for pipe pile locations.
1. Surveyor shall request electronic drawings from both Owner and Engineer. Drawing files shall be compared and compiled prior to generating coordinates.
 2. Coordinates shall be accurate to plus/minus one-quarter inch (1/4") in either direction.

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by the owner or Engineer.
 2. Allow for structure movement, including thermal expansion and contraction.
- G. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- H. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.8 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01700

SECTION 01731 - CUTTING AND PATCHING

PART1-GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. Related Sections include the following:
 - 1. Division 1 Section 01732 "Selective Demolition" for demolition of selected portions of the building for alterations.
 - 2. Divisions 2 through 16 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.3 DEFINITIONS

- A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
 - 1. Exterior Walls
 - 2. Piling
 - 3. Concrete Abutments
 - 4. Riverwalks
 - 5. Dockwalls
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
- C. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction in a manner that would, in Owner's or Engineer's opinion, reduce the structure's aesthetic qualities. Remove and replace construction that has been cut and patched in a

visually unsatisfactory manner.

1. If possible, retain original Installer or fabricator to cut and patch exposed Work. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.

PART 2-PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3-EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
 4. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

END OF SECTION 01731

SECTION 01732 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Demolition and removal of selected portions of a building or structure.
 - 2. Demolition and removal of selected site elements.
 - 3. Repair procedures for selective demolition operations.
- B. Related Sections include the following:
 - 1. Division 1 Section 01320 "Construction Progress Documentation" for preconstruction photographs taken before selective demolition.
 - 2. Division 1 Section 01500 "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for selective demolition operations.
 - 3. Division 1 Section 01731 "Cutting and Patching" for cutting and patching procedures for selective demolition operations.
 - 4. Division 2 Section 02230 "Site Clearing for site clearing and removal of above- and below-grade improvements.

1.3 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 them to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them 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.

1.4 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.
- B. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during selective demolition remain Owner's property.
- C. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.

1.5 SUBMITTALS

- A. 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.
- B. 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 that Owners, building managers and other tenants on-site operations are uninterrupted.
 - 2. Interruption of utility services.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Use of elevator, stairs, and adjacent Riverwalks.
 - 5. Locations of temporary partitions and means of egress, including for other tenants affected by selective demolition operations.
 - 6. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- C. Predemolition Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.

1.6 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations

of authorities having jurisdiction.

C. Standards: Comply with ANSI A10.6 and NFPA 241.

1.7 PROJECT CONDITIONS

A. Individual property owners will occupy portions of buildings immediately adjacent to selective demolition area. Conduct selective demolition so owner's operations will not be disrupted. Provide not less than 72 hours' notice to property owner of activities that will affect that owner's operations.

B. Maintain access to existing walkways, corridors, riverwalks, and other adjacent occupied or used facilities.

1. Do not close or obstruct walkways, corridors, riverwalks, or other occupied or used facilities without written permission from authorities having jurisdiction.

C. Owner assumes no responsibility for condition of areas to be selectively demolished.

1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

2. Contractor shall fully document using photographs, video, or drawings all existing conditions in areas where selective demolition is to occur. Contractor shall continue to monitor conditions while all work performed and provide a report to the Owner documenting the demolition process and its affect on adjacent structures.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials will be removed by Owner before start of the Work.

2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Owner. Hazardous materials will be removed by Owner under a separate contract.

E. Storage or sale of removed items or materials on-site will not be permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2- PRODUCTS

2.1 REPAIR MATERIALS

- A. Use repair materials identical to existing materials.
 - 1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 2. 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 the 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 the nature and extent of conflict. Promptly submit a written report to Engineer.
- E. Perform 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 to other parts of building.
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. 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 and to and from occupied portions of building.
 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 3. Protect walls, floors, railings, decking, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 4. Cover and protect furniture, furnishings, and equipment that have not been removed.

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 on adjacent surfaces and areas.
- 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 the 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, from higher to lower level.

- Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 5. Maintain adequate ventilation when using cutting torches.
 6. Dispose of demolished items and materials promptly.
 7. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.
- B. Existing Facilities: Comply with building manager's requirements for using and protecting elevators, stairs, walkways, riverwalks, building entries, and other building facilities during selective demolition operations.
- C. 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.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Owner, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.
- E. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.

3.6 PATCHING AND REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by selective

demolition operations.

B. Patching: Comply with Division 1 Section 01731 "Cutting and Patching."

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.

END OF SECTION 01732

SECTION 01770 - CLOSEOUT PROCEDURES

PART1-GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Project Record Documents.
 - 3. Operation and maintenance manuals.
 - 4. Warranties.
 - 5. Final cleaning.
- B. Related Sections include the following:
 - 1. Division 1 Section 01290 "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
 - 2. Division 1 Section 01320 "Construction Progress Documentation" for submitting Final Completion construction photographs and negatives and other related materials.
 - 3. Division 1 Section 01700 "Execution Requirements" for progress cleaning of Project site.
 - 4. Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for products of those Sections.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 3. Prepare and submit Project Record Documents, operation and maintenance

- manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
4. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 5. Complete final cleaning requirements, including touchup painting.
 6. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner will review Punch List and prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Owner, or Owner's consultant, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Owner will submit two copies of list. Including name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
- B. Execution: Contractor will take all appropriate action in a reasonable timeframe to

correct noted deficiencies. Upon completion of the work, Contractor shall notify Owner that punch list is complete and ready for reinspection.

1.6 PROJECT RECORD DOCUMENTS

- A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Owner's reference during normal working hours.
- B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.
 - 1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before endorsing concealed installations.
 - d. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.
 - 2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 - 3. Mark important additional information that was either shown schematically or omitted from original Drawings.
 - 4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
 - 5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 6. Submit one copy of the record drawings to the Owner.
- C. Record Product Data: Submit one copy of each Product Data submittal. Mark one set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, Record Drawings, where applicable.
- D. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.7 OPERATION AND MAINTENANCE MANUALS

- A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:
1. Operation Data:
 - a. System, subsystem, and equipment descriptions, including operating standards.
 - b. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
 - c. Description of controls and sequence of operations.
 - d. Piping diagrams.
 - e. Electrical diagrams.
 2. Maintenance Data:
 - a. Manufacturer's information, including list of spare parts.
 - b. Name, address, and telephone number of Installer or supplier.
 - c. Maintenance procedures.
 - d. Maintenance and service schedules for preventive and routine maintenance.
 - e. Maintenance record forms.
 - f. Sources of spare parts and maintenance materials.
 - g. Copies of maintenance service agreements.
 - h. Copies of warranties and bonds.
- B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the

printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.8 WARRANTIES

- A. Commencement: Unless specifically requested by the Owner, all warranties shall commence at the point of Substantial Completion.
- B. Partial Occupancy: At the request of the Owner, submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.
- E. This Contractor shall guarantee to replace or repair promptly at their own expense, as directed by the Commissioner of Public Works or his agent, all workmanship in which defects may develop within one (1) year from the date of final acceptance of his work excepting as may be hereinafter specified. This guarantee includes all damage done by the City due to faulty equipment, poor installation or poor construction. The City shall also receive any extended guarantees or warranties normally supplied by any vendor or manufacturer for material or equipment incorporated in the work.

PART 2-PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property (including landscaping) or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - d. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01770

SECTION 02230 - SITE DEMOLITION AND CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Removal and disposal of site debris.
- B. Protection of project entrances and exits.

1.3 REFERENCES

- A. State of Wisconsin Department of Transportation — Standard Specifications for Highway and Structure Construction — Current Edition, including Supplements.
- B. Wisconsin Department of Natural Resources — Wisconsin Construction Site Best Management Practice Handbook — 1992 edition (WDNR).

1.4 DEFINITIONS

- A. Tree — Woody perennial plant, single main stem with trunk, diameter of 6 inches or greater. Multiple-stem trees with forks up to 4 feet from ground elevation shall be considered a cluster of trees. Trees that fork above 4 feet shall be considered a single tree.
- B. Sapling — Woody perennial plant with single stem with trunk less than 6 inches in diameter.
- C. Root Zone — Area around a tree extending as far from tree base as longest horizontal branches.
- D. Surface Water — Soil water that flows through ditch lines, creeks, and streams by gravity.
- E. Grubbing — To clear project site by removing roots and stumps.
- F. Clearing — Cutting down of bushes and trees and the digging and removal of their roots and stumps.
- G. Clearing Limits — Area designated on Drawings scheduled for clearing operations within project site or right-of-way.
- H. Herbicide — Post emergence type, used to kill entire plant or vegetation, including root system.

1.5 SUBMITTALS

Not Used.

1.6 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 the Section.
- D. Conform to applicable code for environmental requirements, disposal of debris, burning debris on site, and use of herbicides.
- E. Coordinate clearing Work with utility companies.

PART 2-PRODUCTS

2.1 MATERIALS

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 shall be solely responsible to provide advance notice to the designated "ONE CALL SYSTEM" not less than three working days prior to commencement of any excavation required to perform work contained in the project, and further, Excavator shall comply with all requirements of this Statute relative to Excavator's Work.

3.2 PREPARATION

- A. Verify erosion control is in place prior to start of Work.

- B. Verify that existing plant life designated to remain is tagged or identified and protected.
- C. Identify a salvage area for placing removed materials.

3.3 PROTECTION

- A. Maintain and repair damaged erosion control items throughout Work.
- B. Protect utilities that remain, from damage.
- C. Do not divert or relocate surface water without prior written approval from Architect/Engineer.
- D. Protect trees, plant growth, and features designated to remain as final landscaping.
- E. Protect bench marks, survey control points, and existing structures from damage or displacement.
- F. Keep entrances and exits, and adjacent roadways affected, free of debris from clearing operations.

3.4 CLEARING

Clear area required for access to site and execution of Work.

3.5 REMOVAL

- A. Remove debris, rock, and extracted plant life from site.
- B. Partially remove designated structures. Neatly saw cut edges at right angle to surface.
- C. Notify Owner and Engineer if underground storage tanks and piping is uncovered during Work.

PART 4-PAYMENT

The contractor shall be paid on a lump sum basis for this work.

END OF SECTION 02230

SECTION 02459 - CONCRETE FILLED STEEL PILES

PART1-GENERAL

1.1 SUMMARY

A. Section Includes:

1. Driven steel pipe shell, filled with concrete.

B. Related Sections:

1. Section 01270 - Unit Prices: Requirements for submitting unit prices.
2. Section 03300 — Concrete: Requirements for concrete fill.

C. Unit Prices:

1. Designed Piles:

- a. Design Pile Quantity: Determined by the quantity of piles indicated in the Contract Documents.
- b. Design Pile Length: By the linear foot measured from base to cut-off elevation.

2. Actual Piles:

- a. Actual Pile Quantity: Determined by quantity of piles identified in the Project Record Documents.
- b. Actual Pile Length: Determined by length of piles identified in Project Record Documents.

3. Adjustments in Contract Price will be made due to changes in number and length of piles, based on unit prices established in Section 01270 - Unit Prices and as follows:

- a. Actual pile quantity.
- b. Actual pile length based on measurement of total linear measurement of piling from base to top of pile elevation.

4. Determination of Unit Measurements: Identified by site measurements and verified by the testing agency.

1.2 REFERENCES

- A. American Welding Society (AWS):

1. AWS D 1.1 - Structural Welding Code.
- B. American Society for Testing and Materials (ASTM International):
 1. ASTM A252 — Structural Specification for Welded and Seamless Steel Pipe Piles.

1.3 PERFORMANCE REQUIREMENTS

- A. Drive closed end piles to load supporting capacity as indicated on drawings. The Contractor shall perform the necessary geotechnical investigation, including a soil boring, soil testing, and load testing as required to develop driving criteria specific to the hammer and the site.

1.4 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Requirements for submittals.
- B. Within seven days of the Notice to Proceed, submit information regarding the make and model of the hammer which will be used, thickness of hammer cushion, and any other items relevant to developing the pile driving criteria.
- C. Shop Drawings: Indicate details and schedules of pile installation, identify pile lengths and diameters.
- D. Manufacturer's Mill Certificate: Certify that steel casings, meets or exceeds specified requirements.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01700 - Execution Requirements: Requirements for submittals.
- B. Section 01770 - Closeout Procedures: Accurately record and submit the following:
 1. Sizes, lengths, and locations of piles.
 2. Sequence of driving.
 3. Number of blows per foot for entire length of piles and measured set for last 10 blows.
 4. Final base and top elevations.

1.6 QUALITY ASSURANCE

- A. Installer: Company specializing in performing the work of this section with minimum five years documented experience.
- B. Select pile components under direct supervision of a Professional Structural Engineer

experienced in design of this work.

- C. Welder's Certificates: Submit under provisions of Section 01400 Certificates verifying that welders employed on the Work have been tested and certified in accordance with AWS Standards within the previous 12 months.

1.7 SCHEDULING

- A. Schedule work under the provisions of Section 01310 - Project Management and Coordination.

1.8 LOCATION

- A. Contractor shall engage a qualified surveyor to provide coordinate locations for all piles. Coordinates shall be based on Engineer's drawings.

PART 2-PRODUCTS

2.1 MATERIALS

- A. Type II: Oil field pipe shells, ASTM A252, Grade 3, modified to $f_y = 80$ ksi and a carbon equivalency of no greater than 0.55.
 - 1. Wall: Plain.
 - 2. Ends: Plain.
 - 3. Outside Diameter: Constant diameter, 11 3/4-inch.
 - 4. Minimum Wall Thickness: .534 inches.
 - 5. End Plate: Minimum 1/2-inch thickness with diameter 1/2-inch larger than pile diameter.
- B. Concrete Materials and Mix: Specified in Section 03300.
- C. Pile Cushion Cap: Formed and welded steel.

PART 3-EXECUTION

3.1 EXAMINATION

- A. Verify site conditions under provisions of Section 01700 Execution Requirements.

3.2 PREPARATION

- A. Use driving method that will not cause damage to nearby structures.
- B. Notify adjacent and affected landowners and building occupants with written notice delivered 30 days before proceeding with Work.
- C. Contractor, prior to any pile driving 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.

- D. In accordance with Wisconsin Statute 182.0175, "Damage to Transmission Facilities", Contractor shall be solely responsible to provide advance notice to the designated "ONE CALL SYSTEM" not less than three working days prior to commencement of any pile driving work contained in this Project, and further, Contractor shall comply with all other requirements of this Statute relative to pile driving Work.
- E. Protect structures near Work from damage.
- F. Perform a precondition survey of adjacent buildings prior to installation of piles.

3.3 INSTALLATION

- A. Piles shall be driven and monitored to satisfy driving criteria established by the Contractor's Geotechnical Investigation and Pile Load Testing.
- B. Drive piles to obtain load capacities specified.
- C. Protect pile head during driving, using cushion cap with full bearing on pile for even distribution of hammer blow.
- D. Deliver hammer blows to central axis of pile.
- E. Re-drive pipe shells that have lifted or moved due to driving adjacent piles, or by soil uplift.
- F. Do not damage piles during driving operations.
- G. Set or cut tops of piles to elevations indicated.
- H. Perform vibration monitoring during all pile driving operations.
- I. Allow inspection of pile casing prior to placement of concrete.
- J. Piles may be placed in segments, butt-welded, with full penetration groove welds. Joint shall be watertight and develop full strength of steel pipe. Welding to be preformed by AWS certified welders.
- K. Place concrete in single pour, in accordance with Section 03300 - Concrete, with equipment designed for vertical placement of concrete. Vibrate concrete full depth of pile.
- L. Concrete shall not be placed in piles within a radius of twenty feet of ongoing driving operations. If concrete must be placed within this limit, the driving operations shall cease until concrete has cured for a minimum of seven days or three days for high

early strength concrete.

M. Prepare pile top to receive cap plate or cap sleeve.

3.4 TOLERANCES

A. Maximum Variation From Vertical For Plumb Piles: 1 in 48.

B. Maximum Variation From Required Angle For Batter Piles: 1 in 24.

C. Maximum Variation From Top of Pile Elevation: 1/4 inch.

D. Maximum Out-of-Position: 1 inch.

3.5 FIELD QUALITY CONTROL

A. Monitoring of pile-driving operations and preparation of driving records shall be performed by Contractor and observed by Owner's representative.

B. Concrete test cylinders shall be taken in accordance with Section 03300 - Concrete.

C. Field tests, vibration monitoring, pile load testing, and revisions to pile driving criteria due to variable field conditions, shall be performed by the Contractor and observed by the Owner's representative.

3.6 UNACCEPTABLE PILES

A. Unacceptable Piles: Piles that fail tests, are placed out of position, are below cut-off elevations, or are damaged.

B. Provide additional piles or replace piles to conform to specified requirements.

END OF SECTION 02459

SECTION 02462 – STEEL SHEET PILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel Sheet Pile Wall and Anchor pile wall:
 - a. Provide driven steel sheet piling, watertight, with sealed interlocks.
 - b. Provide steel wales, deadman anchor piles, and tie rods.
 - c. Provide corrosion protection, coatings.
 - d. Provide Construction Work Plan.
 - e. Provide Quality Control / Quality Assurance monitoring and testing.

B. Related Sections:

1. Section 01270 — Unit Prices: Requirements for submitting unit prices.

C. Unit Prices

1. Designed Wall:

- a. Designed wall length by the linear foot as indicated on the plans.

2. Actual Wall:

- a. Actual wall length by the linear foot as measured in the field.

3. Adjustments in Contract Price will be made due to changes in the wall length, based on the unit price established in Section 01270-Unit Prices and as follows.

- a. Actual wall length based on measurement of total linear feet. The wall length is measured on a straight line at the top of the wall parallel to the river. The wall length is not measured following the shape of the sheeting.

1.2 DESIGN AND PERFORMANCE REQUIREMENTS

- A. The CONTRACTOR is responsible for the design of the continuous steel sheet pile wall and anchor piles.
- B. The top elevation of the steel sheet pile wall shall be as shown on the plans.
- C. Design the steel sheet pile wall for a traffic surcharge of 240 psf. The wall shall also be designed for the riverwalk bracing reactions due to ice loading shown on the plans.
- D. The CONTRACTOR shall perform the necessary geotechnical investigation

including a soil boring, soil testing, and load testing as required for the design of the steel sheet pile wall and anchor pile wall.

1.3 SUBMITTALS

A. Qualifications:

1. Submit design calculations and detailed drawings sealed by a professional engineer licensed in the State of Wisconsin.
2. Submit qualifications for steel sheet pile wall construction, including previous experience.
3. Submit contact information for at least 3 references. References shall be for projects completed within previous 5 yrs.
4. Submit qualifications of sheet pile wall field supervisor and other key staff.
5. Sheet pile CONTRACTOR and CONTRACTOR's key personnel shall have a minimum of 10 years experience in sheet pile and foundation pile construction, including waterfront and bulkhead work.

B. Product Data:

1. Submit manufacturer's data for steel sheet piles and anchor piles.
2. Submit manufacturer's data for sheet pile interlock sealant.
3. Submit mill certifications for all steel materials.

C. Shop Drawings:

1. Structural steel shop drawings.
2. Sheet pile interlock sealant.
3. Sheet pile coating/finish.
4. Sheet pile splice detail, including repairs to interlock sealant and coal tar epoxy coating.
5. Sheet pile interlock confirmation/verification procedure.

D. Construction Work Plan:

1. Submit detailed Construction Work Plan. Work Plan shall include, but not be limited to:
 - a. Site preparation, including clearing/grubbing, pavement cutting including

removal and replacement, fencing removal and replacement, construction of working areas, etc.

- b. Pile driving methods and tools, including cranes, vibratory (and/or impact) hammers and other construction equipment including driving frame. Provide complete description of pile hammer(s), including manufacturer's name, model number, operational characteristics, rated energy, age, date(s) of last overhaul, etc.
- c. Pile driving templates and guide structures.
- d. Sequence of bulkhead wall installation. Detailed sheet pile driving sequence and procedures.
- e. Sheet pile driving hammer(s), including Wave Equation Analysis to evaluate sheet pile driving stresses and driveability.
- f. Driving hammer(s) and methods for installing deadman anchor piles. Wave Equation Analysis to evaluate anchor pile driving stresses and driveability.
- g. Quality Control, including procedures for maintaining alignment, plumbness, and wall continuity.

E. Contingency Plan:

1. Submit detailed Contingency Plan as an attachment to Construction Work Plan. Contingency Plan shall include, but not be limited to:
 - a. Work stoppages due to equipment failure, adverse weather, or other unforeseen situations. Include procedures for providing continuity between portions of wall constructed before and after stoppage.
 - b. Obstructions, including buried debris, etc. that interferes with installation of steel sheet pile. Include procedures for removal of obstructions and procedures for bypassing obstructions. Bypass procedures shall not compromise continuity of steel sheet pile wall.
 - c. Difficult driving conditions due to dense soil conditions. Include alternative procedure(s) for installing steel sheet piles such as use of heavier hammers, etc.

F. Construction Records:

1. Driving Logs: Maintain detailed records of each insertion of steel sheet pile. Submit sample log template for approval. Submit records of insertions daily. Driving logs shall include, but not be limited to:
 - a. Name of CONTRACTOR.
 - b. Name of OWNER.

- c. Project name.
- d. Date and time.
- e. Sheet/anchor pile identification and location.
- f. Name of hammer manufacturer/model.
- g. Type of pile cap/cushion used.
- h. Pile dimensions, size and length.
- i. Length of pile taken in leads.
- j. Ground elevation.
- k. Final tip elevation.
- l. Elevation of cut-off.
- m. Effective length left in-place.
- n. Final elevation of bottom of coal tar epoxy coating.
- o. Pile deviation from plan location.
- p. Time at start of sheet /anchor pile placement.
- q. Time to drive sheet /anchor pile to final elevation.
- r. Notes on unusual phenomena.

G. Daily Logs:

1. Daily and project totals to include:
 - a. Sheet /anchor pile insertions.
 - b. Range and average depth of penetration in feet.
 - c. Linear footage of progress of wall.
 - d. Areas of wall that required repair/reinsertion
 - e. Utilities/Penetrations addressed.

H. Project Closeout records.

1. Submit construction report with as-built drawings and all field logs and construction records. Construction report shall be sealed by Professional Engineer licensed in State of Wisconsin.
2. Survey as-built location and elevation.

I. Provide certificates of compliance to material requirements set forth in this section.

J. Submit in accordance with Section 01340.

1.4 PROJECT/SITE CONDITIONS

- A. Protect structures, underground utilities, and other construction from damage caused by pile driving operations.
- B. Provide surveyed elevation bench marks on structures where required by ENGINEER or OWNER before commencing work when structures are within 100 ft of pile driving operations. Record and report elevation of each bench mark after driving piles and at least twice daily while pile driving is in progress. Should bench mark readings indicate displacement, halt driving operations until corrective action

has been provided and is acceptable to ENGINEER or OWNER.

- C. Provide crack gauges on structures where required by ENGINEER or OWNER before commencing work when structures are within 100 ft of pile driving operations. Record and report crack gauge measurements after inserting beams, and at least twice daily while pile driving is in progress. Should crack gauge readings indicate displacement, halt driving operations until corrective action has been provided and is acceptable to ENGINEER or OWNER.
- D. Monitor vibrations of structures at locations approved by ENGINEER or OWNER in accordance with Section 1391. Should measurements indicate excessive vibration, halt driving operations until corrective action has been provided and is acceptable to ENGINEER or OWNER.

1.5 QUALITY ASSURANCE

- A. Qualify welders, welding processes and procedures in accordance with AWS D1.1.

PART 2-PRODUCTS

2.1 MATERIALS

- A. Piling and Accessories: ASTM A572 or A992, Grade 50.
 - 1. Sheet Piling shall be continuous interlock type.
 - 2. Handling hole at top end of each section shall be located above final cutoff elevation.
 - 3. Sheet /anchor pile plan length and section type shall be as designed by the CONTRACTOR.
- B. Structural Steel Shapes and Plates: ASTM A572 or A992, Grade 50.
- C. Welding Electrodes: AWS A5.1 or A5.5.
- D. Bolts, Nuts and Washers: ASTM A325.
- E. Turnbuckles: A668 Class A C1035.
- F. Couplers and Sleeve Nuts: ASTM A29.
- G. Tie Rods: ASTM A722-98 epoxy coated.
- H. Epoxy Coating: ASTM A775-85.
- I. Coal Tar Epoxy: SSPC 16-91.
- J. Galvanized Coating: ASTM A123.

- K. Neoprene Washers: ASTM D-2000.

2.2 FABRICATION

- A. Fabricate in accordance with applicable AISC specifications, drawings, and approved Shop Drawings.
- B. Welding shall be electric arc method in accordance with AWS D1.1, E70XX electrodes conforming to AWS A5.1 or A5.5 for shielded metal arc method and F7X-EXXX flux electrode combination conforming to AWS 5.17 for submerged arc method.
- C. Mark and match-mark materials for field assembly.
- D. Weld shop connections, bolt or weld field connections, unless otherwise noted or specified.

2.3 DRIVING EQUIPMENT

- A. Provide pile driving equipment of type generally used in standard steel sheet pile and pile driving practice, operated in accordance with manufacturer's specifications and recommendations. Pile driving equipment shall be capable of driving piles to required depths without damage.
- B. Provide vibratory and/or impact pile driving hammers of sufficient capacity and size suitable for efficiently driving sheet/anchor piles in soils encountered at this site.
- C. Equip hammer with suitable driving cap/cushion conforming to specific pile shape.
- D. Provide sheet/anchor pile driving template or frame suitable for aligning, supporting, and maintaining sheet/anchor pile in correct position during setting and driving. Use system of structural framing sufficiently rigid to resist lateral and driving forces and to adequately support piling until design tip elevation is achieved. Templates shall be fixed so as to not move or shift as piles are driven. Prevent piles from warping or wandering from alignment, or racking along alignment.
- E. Use fixed or rigid-type pile driver leads that will hold pile firmly in position, alignment and in axial alignment with hammer. Extend leads to within 2 ft of elevation at which pile enters ground.

2.4 INTERLOCK VERIFICATION

- A. Use Dixeran system (Arcelor Mittal Steel) to verify interlock over full length of sheetpile.
- B. CONTRACTOR may propose alternative methods to verify interlocks, as approved by the Design/Builder.

PART 3- EXECUTION

3.1 DRIVING SHEET PILING

- A. Order length of piles shall be determined by CONTRACTOR.
- B. Once driving for pile is started, pile shall be driven to required penetration without stopping.
- C. When high-resistant strata lying near surface must be penetrated, rotary drilling or spud piles may be used to minimize hard driving of long piles during early stages of driving operations. Augering and spudding shall not be allowed in deeper, low permeability soils (corresponding to Lacustrine Unit 1, Lacustrine Unit 2, and Glacial Diamicton Units). Jetting is not allowed.
- D. Backfill voids between pile and pre-excavated holes using grout.
- E. Observations shall be made to determine uplift of adjacent piles. Uplifted piles shall be back driven to original elevation, without additional cost to ENGINEER or OWNER. It may be necessary to weld sheet piles together to avoid uplift so that interlock sealant is not damaged.
- F. Drive sheet piling by approved methods to not subject piles to serious damage and to ensure perfect interlocking with adjoining piles throughout length of piles. Take precautions to ensure piles are within specified tolerance to line and grade.
- G. Sheet pile ruptured in interlock or otherwise considered significantly damaged by ENGINEER or OWNER shall be pulled and new pile driven in its place.
- H. Cut-off tops of driven piles square with pile axis and at elevations indicated. Dispose of excess materials off site.
- I. See section 3.06 for special installation requirements regarding sheet pile Interlock sealant.

3.2 WALES

- A. Wales shall consist of steel structural shapes, galvanized after fabrication, and be bolted securely to steel piling.
- B. Wales that are tilted, bent, or otherwise damaged during progress of construction shall be aligned, straightened or replaced as required by ENGINEER or OWNER.
- C. Wale splices shall be shown on shop drawings.

3.3 BOLTING

- A. Install bolts at proper location and set straight and square with connecting members.
- B. Make holes in metal members by drilling or cutting by torch, using template, subject to approval of ENGINEER or OWNER. Only drilled holes shall be used in sheet

piles.

- C. After drilling, holes which are too small or out of shape shall be reamed to required size.
- D. Remove projecting metal and burrs.
- E. Unless otherwise indicated or specified, holes shall be not more than 1/8 in. larger than diameter of item being installed.
- F. Provide plain washers under nuts of bolts except where beveled washers required or plate washers noted.
- G. Nuts on bolts shall be drawn up tight and, where indicated, threads of bolt shall be peened or tack welded.

3.4 WELDING

- A. Welded connections shall be indicated on shop drawings.
- B. Weld in accordance with AWS D1.1.
- C. Welding shall be performed by certified structural welders in accordance with AWS D1.1.

3.5 TIE RODS

- A. Tie-rod locations shall be shown on shop drawings.
- B. Place tie-rods in sand bedding to protect coating.
- C. Tie rods shall be cut using an abrasive wheel or band saw. Torch cutting is not allowed.

3.6 INTERLOCK SEALANT

- A. Sealant shall be Roxan® system from Profil Arbed.
- B. Sealant shall be factory applied. Adhere to all manufacturer's specifications, recommendations, and guidelines.
- C. When stored or transported, sealed interlocks shall always face down to avoid contact with standing water to avoid premature swelling of sealant.
- D. When driving sheet piles with sealed interlocks, leading edge shall always be interlock without sealant.
- E. Each interlock shall be cleaned during installation with factory specified cleaning tool.

- F. Interlocks with water-swelling product shall be lubricated with commercial soap-based product just prior to installation.
- G. Top of each untreated (leading) interlock shall be chamfered and free of burrs, so that sealed interlock will not be damaged during installation.
- H. Special attention shall be given to keep piles plumb in order to minimize friction during driving. When vibratory hammers are used, special care shall be taken to ensure that temperature of interlock does not exceed 130°C to avoid damaging sealant. CONTRACTOR shall have water readily available at all times to cool interlock if specified temperatures are exceeded. Sheet piles in which sealant has smoldered or burned shall be extracted and defective sealant removed and replaced in accordance with manufacturer's specifications.
- I. If hard driving is encountered ENGINEER or OWNER may require use of an impact hammer in order to minimize heat buildup.
- J. Sheet piles with sealed interlocks must be driven to required depth within 2 hours after start to minimize premature swelling of sealant, in accordance with manufacturer's specifications.
- K. Prevent unwanted movement between adjacent sheet piles that may cause failure of sealant that has previously set.
- L. Cut off sheet piles in accordance with sheet pile and sealant manufacturer's recommendations to prevent damage to sealant. Use respirators as needed, as recommended by sheet pile and sealant manufacturer.

3.7 GALVANIZED COATINGS (hardware and walers)

- A. All required materials shall be galvanized in accordance with ASTM A123 Zinc (Hot-Dip Galvanized) Coating of Iron and Steel Products. Coating shall be factory applied.
- B. Field galvanizing repair will be required when total damaged area on each piece or component is greater than 0.10 in². Any single piece or component with total damaged area greater than amount specified above shall be repaired in accordance with methods specified below, and shall not be basis for additional compensation.
- C. Any damage resulting from wet storage (white rust), welding or cutting (flame) or from excessive rough handling during shipping or erection shall be repaired prior to installation. Corrosion deposits shall be removed completely prior to incorporation of material in work. After removal of these deposits, coating shall have uniform appearance free from uncoated spots, lumps, blisters, gritty areas, acid, flux and black spots. Damaged areas of loose and deteriorated galvanized zinc coating shall be cleaned by power sanding, power grinding, or abrasive blast cleaning to bright metal before application of coating.
- D. Materials for field repair shall be Zinc paint with not less than 65% zinc dust (by

weight) in dried paint film and shall meet current standards for emission of volatile organic compounds. Zinc paint shall be applied in accordance with manufacturer's instructions for use, using brush or by spray methods. Zinc paint shall be applied in such quantity as to produce minimum dry film thickness of 75 µm.

3.8 COAL TAR EPOXY (sheet piling)

- A. Coating shall be coal tar epoxy-polyamide conforming to Steel Structures Painting Council specification SSPC Paint 16; color black. Submit certificates of conformance for Coal Tar Epoxy-Polyamide for approval. Coating shall be factory applied to elevations specified on the shop drawings.
- B. Apply coating only when ambient and curing temperatures are within limits of coating manufacturer's recommendations and at least 9 degrees C above dew point temperature.
- C. Surface Preparation: Solvent-clean surfaces in accordance with SSPC SP 1. Remove visible oil, grease, and drawing and cutting compounds by solvent cleaning. After solvent cleaning, complete surface preparation by near-white blast cleaning in accordance with SSPC SP 10. Remove residual dust from blasted surfaces by blowing with dry, oil-free air, vacuuming, or sweeping. Provide surface profile of at least 0.064 mm (2.5 mils).
- D. Coal tar epoxy-polyamide shall consist of two-component system. Component A shall contain refined coal tar pitch, polyamide resin, and polyamine promoter to accelerate curing rate. Component B shall be an epoxy resin. Mix both components at ratio of 4 parts of Component A to 1 part of Component B by volume, unless otherwise indicated in product Manufacturer's written instructions. Mix by Power-stirring components to smooth, uniform consistency, and stir coating periodically during induction period. Follow coating manufacturer's requirements for induction time and pot life of mixed batches. Do not thin coatings. Doing so will result in total of volatile organic compounds exceeding limits enacted by local air pollution control districts. When thinning is allowed and is necessary for proper application, use xylene, or coating manufacturer's recommended thinner, to maximum of 1 gallon per 10 gallon batch.
- E. Apply primer coating to dry surfaces not more than 4 hours after near-white blast cleaning. After applying primer, apply 2 coats of coal tar epoxy mixture, each having thickness of 8 mils (16 mil total thickness). Apply to in manner so that finished surfaces are free from runs, sags, brush marks and variations in color. Unless otherwise specified by manufacturer's recommendations, do not allow drying time between coats to exceed 72 hrs. Under conditions of direct sunlight, or elevated ambient temperatures of 32 degrees C or greater; limit inter coat drying period to maximum of 24 hours. Repair defected coating holidays, thin areas, and exposed areas damaged prior to, or during installation, by surface treatment and application of additional coating, or per manufacturer's recommendations. Allow period of at least 72 hours to pass following final coating. Provide total system minimum dry film-thickness of 0.406mm (16 mils) as measured by magnetic dry-film thickness gage, in accordance with ASTM D1186 and ASTM E376.

- F. Materials listed in this section contain coal tar pitch volatiles, which are toxic. Follow safety procedures as recommended by manufacturer. Work in well-ventilated area. Provide, and require workers to use, impervious clothing, gloves, face shields (200 mm minimum), and other appropriate protective clothing necessary to prevent eye and skin contact with coating materials. Keep coatings away from heat, sparks and flames.

3.9 EPOXY COATING (tie-rods)

- A. Epoxy coating material shall be an organic, powdered-epoxy resin that is applied by electrostatic methods.
- B. Surface of tie-rods to be coated shall be blast cleaned in accordance with Steel Structures Painting Council - Surface Preparation Specification No. 10 (SSPC-SP10), Near White Blast Cleaning. After blasting, cleaned surface of bar shall be defined by SSPC-Vis 1-89, Pictorial Standards A SP 10, B SP 10, or C SP 10, as applicable. An anchor pattern of about 1/3 coating thickness shall be produced by cleaning media. Measurements shall be taken using surface profile gage, or replica tape. Powdered epoxy resin coating shall be applied to cleaned surface as soon as possible after cleaning and before visible oxidation occurs. In no case shall more than 8 hrs elapse between cleaning and coating.
- C. Powdered epoxy resin coating shall be applied electrostatically to pre-heated rods, and cured in accordance with recommendations of coating manufacturer. Epoxy coating shall be applied as uniform, smooth coat. After curing, coating thickness shall be 0.01 ± 0.002 in. Coating thickness shall be measured by method outlined in ASTM G12, except that number and location of thickness measurements shall be in accordance with this specification.
- D. Coating shall be checked visually after cure for continuity. It shall be free from holes, voids, contamination, cracks and damaged areas. Coating shall have not more than two holidays (pinholes not visible to naked eye) in any 0.3 m length of coated bar. 67.5 volt, 80,000 ohm, d-c holiday detector shall be used in-line to check coating for holidays at all times during application of epoxy protective coating.
- E. Fabricator shall be responsible for repair to coating due to damage during fabrication and handling at fabricator's facility. All coating damage due to fabrication, or handling, or for other reasons that occurs at fabricator's facility shall be repaired with patching material. Wherever bond loss or damaged areas of coating exist, they shall be cleaned and repaired. Cleaning shall remove loose or deleterious material, or both. In cases where rust is present it shall be removed by blast cleaning prior to repairs. Visible cracks, including hairline cracks without bond loss that occur due to fabrication of bars, shall be repaired with patching material. When coated rods are sheared, saw-cut, or cut by other means during fabrication process, exposed ends shall be coated with patching material. All repairs shall be performed as soon as possible and before visible rust (oxidation) appears on steel surface.
- F. CONTRACTOR will be required to field repair damaged areas of coating, and to replace rods exhibiting severely damaged coating. Materials used for field repair

shall be supplied by coating applicator. Field repair will be required on all areas of major damage. Major damage is defined as any defect or break in epoxy coating 0.25 in. x 60.25 in. or greater. Total number of all major damaged areas which have been repaired with patching material shall not exceed five in any 10-ft length of bar. Field repair will not be required on areas of minor damage. Minor damage is defined as any defect or break in coating less than 6 mm x 6 mm. Maximum number of unrepaired minor damaged areas shall not exceed an average of three per foot on any individual rod. Any tie-rod having coating damage determined by ENGINEER to exceed above criteria shall be rejected and immediately removed from work site. All such tie-rods shall be replaced, in kind, by CONTRACTOR at no additional cost.

- G. All systems for handling coated tie-rods shall have padded contact areas for rods. All bundling bands shall be padded and all bundles shall be lifted with strong back, multiple supports or platform bridge so as to prevent abrasion between rods. Tie-rods or bundles shall not be dropped or dragged. Epoxy-coated tie-rods shall be stored above ground on wooden or padded supports and shall not be stored unprotected outdoors. All coated tie-rods that are stored outdoors shall be protected from sunlight and moisture using opaque waterproof covers. Covers shall be placed in manner that will permit constant air circulation so as to minimize formation of condensation on epoxy-coated surface.

3.10 MISCELLANEOUS STRUCTURAL SHAPES AND PLATES

- A. Where shown on Drawings, provide miscellaneous structural shapes and plates to complete Work.

3.11 FIELD QUALITY CONTROL

- A. Drive piles within following maximum tolerances:
1. Location: 3 in from location indicated.
 2. Plumbness: Maintain 1 in. in 10 ft from vertical or maximum of 4 in., measured when pile is above ground in leads.
 3. Final pile cut-off elevation shall be within 1 in. of Drawing cut-off elevation.
- B. Damaged piles and piles driven outside required driving tolerances will not be accepted. Withdraw piles rejected after driving and replace with new piles.

END OF SECTION 02462

SECTION 02772 – ASPHALT PAVING

PART1-GENERAL

1.1 SUMMARY

A. Section Includes

1. Repaving parking lot where pavement is removed to install tiebacks for dockwall.
2. Pavement Markings.

1.2 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. American Association of State Highway and Transportation Officials (AASHTO):
 - a. M17, Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
 - b. M82, Standard Specification for Cut-Back Asphalt (Medium Curing Type).
 - c. M140, Standard Specification for Emulsified Asphalt.
 - d. T245, Standard Method of Test for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.
2. Asphalt Institute (AI):
 - a. Manual Series No. 2 (MS-2), Mix Design Methods for Asphalt Concrete.
3. ASTM International (ASTM):
 - a. D2041, Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.

1.3 DEFINITIONS

- A. Combined Aggregate: All mineral constituents of asphalt concrete mix, including mineral filler and separately sized aggregates.
- B. RAP: Reclaimed asphalt pavement.

1.4 DESIGN REQUIREMENTS

- A. Prepare asphalt concrete mix design, meeting the following design criteria,

tolerances, and other requirements of this Specification.

B. Design Criteria:

1. Marshall Method, AASHTO T245:
 - a. Number of Blows: 50.
 - b. Air Voids (AI MS-2):3 percent
 - c. Voids in Mineral Aggregate: See Table 1.
 - d. Voids Filled with Asphalt, AI MS-2: 75-80 percent.
 - e. P200/Effective AC Ratio: 0.6 to 1.2.
 - f. Stability, Minimum:1,800 Pounds.
 - g. Tensile Strength Ratio, AASHTO T283: 80 percent, minimum.

Table 1 Voids in Mineral Aggregate (VMA) Criteria	
Nominal Maximum Aggregate Size	Minimum VMA, Percent
3/8"	15
1/2"	14
3/4"	13
1"	12
1-1/2"	11

C. Furnished Mix Tolerances: Conform to asphalt concrete mix formula within the following, plus or minus:

1. Aggregate Passing 4.76 millimeter (No. 4) and Larger Sieves: 5 percent.
2. Aggregate Passing the 2.38 millimeter (No. 8) to 150 μ m (100) Sieves: 4 percent.
3. Aggregate Passing the 75 μ m (No. 200) Sieve: 2 percent.
4. Bitumen Content: 0.3 percent of volume or batch weight of aggregate.
5. Temperature Leaving Mixer: 11 degrees C (20 degrees F).
6. Temperature in Paving Machine Hopper: 11 degrees C (20 degrees F).

1.5 SUBMITTALS

A. Informational Submittals:

1. Asphalt Concrete Mix Formula:
 - a. Submit minimum of 15 days prior to start of production.
 - b. Submittal to include the following information:
 - 1) Gradation and portion for each aggregate constituent used in mixture to produce a single gradation of aggregate within specified limits.
 - 2) Bulk specific gravity for each aggregate constituent.
 - 3) Measured maximum specific gravity of mix at optimum asphalt content determined in accordance with ASTM D2041.
 - 4) Percent of asphalt lost due to absorption by aggregate.
 - 5) Index of Retained Strength (TSR) at optimum asphalt content as determined by AASHTO T283.
 - 6) Percentage of asphalt cement, to nearest 0.1 percent, to be added to mixture.
 - 7) Optimum mixing temperature.
 - 8) Optimum compaction temperature.
 - 9) Temperature-viscosity curve of asphalt cement to be used.
 - 10) Brand name of any additive to be used and percentage added to mixture.
2. Test Report for Asphalt Cement:
 - a. Submit minimum 10 days prior to start of production.
 - b. Show appropriate test method(s) for each material and the test results.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Independent Testing Laboratory: In accordance with ASTM E329.
2. Asphalt concrete mix formula shall be prepared by approved certified independent laboratory under the supervision of a certified asphalt technician.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Temperature: Do not apply asphalt materials or place asphalt mixes when ground temperature is lower than 50 degrees F or air temperature is lower than 40 degrees F. Measure ground and air temperature in shaded areas away from heat sources or wet surfaces.
- B. Moisture: Do not apply asphalt materials or place asphalt mixes when application surface is wet.

PART2-PRODUCTS

2.1 MATERIALS

- A. Tack Coat: Emulsified asphalt, Grade SS-1, SS-1h conforming to AASHTO M140

2.2 ASPHALT CONCRETE MIX

- A. General:
 - 1. Mix formula shall not be modified except with written approval of Owner.
 - 2. Source Changes:
 - a. Should material source(s) change, establish new asphalt concrete mix formula before new material(s) is used.
 - b. Perform check tests of properties of plant-mix bituminous materials on first day of production and as requested by Owner to confirm that properties are in compliance with design criteria.
 - c. Make adjustments in gradation or asphalt content as necessary to meet design criteria.
- B. Asphalt Concrete: Type E-0.3 as specified in the State of Wisconsin Standard Specifications for Highway and Structure Construction.

PART3-EXECUTION

3.1 GENERAL

- A. Traffic Control:
 - 1. Keep vehicles off freshly treated or paved surfaces to avoid pickup and tracking of asphalt.
- B. Parking Lots: Repave parking lots from which pavement was removed. Leave parking lots in as good or better condition than before start of construction.

3.2 LINE AND GRADE

- A. Provide and maintain intermediate control of line and grade, independent of underlying base, to meet finish surface grades and minimum thickness.

3.3 PAVEMENT APPLICATION

- A. General: Place asphalt concrete mixture on approved, prepared base in conformance with Base Aggregate Dense 1 1/4" as specified in the State of Wisconsin Standard Specifications for Highway and Structure Construction.

- B. Tack Coat:

- 1. Apply uniformly to clean, dry surfaces avoiding overlapping of applications.
- 2. Do not apply more tack coat than necessary for the day's paving operation.
- 3. Touch up missed or lightly coated surfaces and remove excess material.

- C. Pavement Mix:

- 1. Place asphalt concrete pavement mix in two equal 1 1/2 inch thick lifts.
- 2. Total Compacted Thickness: 3 inches
- 3. Apply such that meet lines are straight and edges are vertical.
- 4. Collect and dispose of segregated aggregate from raking process. Do not scatter material over finished surface.
- 5. Joints:
 - a. Offset edge of each layer a minimum of 150 millimeters (6 inches) so joints are not directly over those in underlying layer.
 - b. Form transverse joints by cutting back on previous day's run to expose full vertical depth of layer.
- 6. Succeeding Lifts: Apply tack coat to pavement surface between each lift.
- 7. After placement of pavement, seal meet line by painting a minimum of 150 millimeters (6 inches) on each side of joint with cut-back or emulsified asphalt. Cover immediately with sand.

- D. Compaction:

- 1. Uniformly compact each course until there is no further evidence of consolidation and roller marks are eliminated.

2. Joint Compaction:

- a. Place top or wearing layer as continuously as possible.
- b. Cut back previously compacted mixture when Work is resumed to produce slightly beveled edge for full thickness of layer.
- c. Cut away waste material and lay new mix against fresh cut.

E. Tolerances:

1. General: Conduct measurements for conformity with and grade immediately after initial compression. Correct variations immediately by removal or addition of materials and by continuous rolling.
2. Completed Surface or Wearing Layer Smoothness:
 - a. Uniform texture, smooth, and uniform to and grade.
 - b. Maximum Deviation: 1/8 inch from lower edge of a 12-foot straightedge, measured continuously parallel and at right angle to centerline.
 - c. If surface of completed pavement deviates by more than twice specified tolerances, remove and replace wearing surface.

F. Seal Coat:

1. General: Apply seal coat of paving grade or emulsified asphalt to finished surface at longitudinal and transverse joints, joints at abutting pavements, areas where asphalt concrete was placed by hand, patched surfaces, and other areas as directed by Engineer.
2. Preparation:
 - a. Surfaces that are to be sealed shall be maintained free of holes, dry, and clean of dust and loose material.
 - b. Seal in dry weather and when temperature is above 35 degrees F.
3. Application:
 - a. Fill cracks over 1/16 inch in width with asphalt-sand slurry or approved crack sealer prior to sealing.
 - b. When sealing patched surfaces and joints with existing pavements, extend minimum 6 inches beyond edges of patches.

3.4 PAVEMENT MARKINGS

- A. Replace pavement markings in the newly paved area. Use a product intended for this purpose. Follow the manufactures directions. Color to match existing pavement markings.

END OF SECTION 02772

SECTION 02821 – CHAIN LINK FENCES AND GATES

PART1-GENERAL

1.1 SUMMARY

A. Section Includes

1. Chain link fence and gate behind existing and new dockwall at the location of the existing fence. Approximate fence length equals 80 feet.

1.2 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. ASTM International (ASTM):
 - a. A392, Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.
 - b. A780, Standard Specification for Repair of Damaged and Uncoated Areas of Hot-Dipped Galvanized Coatings.
 - c. A824, Standard Specification for Metallic-Coated Steel Marcellled Tension Wire for Use with Chain Link Fence.
 - d. A1011/A1011M, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - e. C387, Standard Specifications for Packaged, Dry, Combined Materials for Mortar and Concrete.
 - f. F552, Standard Terminology Relating to Chain Link Fencing.
 - g. F567, Standard Practice for Installation of Chain-Link Fence.
 - h. F626, Standard Specification for Fence Fittings.
 - i. F900, Standard Specification for Industrial and Commercial Swing Gates.
 - j. F1043, Standard Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.
 - k. F1083, Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.

1.3 DEFINITIONS

- A. Terms as defined in ASTM F552.

1.4 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:

- a. Product Data: Include construction details, material descriptions, dimensions of individual components, and finishes for chain link fences and gates.
- b. Fence, gate posts, rails, and fittings.
- c. Chain link fabric.
- d. Gates and hardware.

B. Informational Submittals:

- 1. Manufacturer's recommended installation instructions.
- 2. Evidence of Supplier and installer qualifications.

1.5 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at project Site with fence and gate installer to verify layout and avoid conflict with tied back dockwalls.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Site in undamaged condition. Store materials off the ground to provide protection against oxidation caused by ground contact.

1.7 SCHEDULING AND SEQUENCING

- A. Complete necessary Site preparation and grading before installing chain link fence and gates.
- B. Interruption of Existing Utility Service: Notify owner of utility 72 hours prior to interruption of utility services. Do not proceed with interruption of utility service without written permission from utility owner.

PART 2-PRODUCTS

2.1 GENERAL

- A. Match style, finish, and color of each fence component with that of other fence components.

2.2 CHAIN LINK FENCE FABRIC

- A. Galvanized fabric conforming to ASTM A392, Type II, Class 2, 2.0 ounces per square foot; galvanized after weaving.
- B. Height: 84 inches, unless otherwise shown.
- C. Core Wire Gauge: No. 11.
- D. Pattern: 2-inch diamond-mesh.
- E. Diamond Count: Manufacturer's standard and consistent for fabric furnished of same height.
- F. Loops of Knuckled Selvages: Closed or nearly closed with space not exceeding diameter of wire.
- G. Wires of Twisted Selvages:
 - 1. Twisted in a closed helix three full turns.
 - 2. Cut at an angle to provide sharp barbs that extend minimum 1/4 inch beyond twist.

2.3 POSTS

- A. General:
 - 1. Strength and Stiffness Requirements: ASTM F1043, heavy industrial fence, except as modified in this section.
 - 2. Round Steel Pipe, Schedule 40: ASTM F1083.
 - 3. Roll-Formed Steel Shapes: Roll-formed from ASTM A1011/A1011M, Grade 45, High-Strength Low-Alloy steel.
 - 4. Lengths: Manufacturer's standard with allowance for minimum embedment below finished grade of 34 inches.
 - 5. Protective Coatings:
 - a. C: Zinc Coating: ASTM F1043, Type A external and internal coating.
- B. Line Posts:
 - 1. Round Steel Pipe:
 - a. Outside Diameter: 2.375 inches.

- b. Weight: 3.65 pounds per foot.
- C. End, Corner, Angle, and Pull Posts:
 - 1. Round Steel Pipe:
 - a. Outside Diameter: 2.875 inches.
 - b. Weight: 5.79 pounds per foot.
- D. Posts for Swing Gates 8 Feet High and Under:
 - 1. ASTM F900.
 - 2. Round Steel Pipe:
 - a. Outside Diameter: 2.375 inches.
 - b. Weight: 3.65 pounds per foot.

2.4 TOP AND BRACE RAILS

- A. Galvanized Round Steel Pipe:
 - 1. ASTM F1083.
 - 2. Outside Diameter: 1.66 inches.
 - 3. Weight: 2.27 pounds per foot.
- B. Protective Coatings: As specified for posts.
- C. Strength and Stiffness Requirements: ASTM F1043, top rail, heavy industrial fence.

2.5 FENCE FITTINGS

- A. General: In conformance with ASTM F626, except as modified by this article.
- B. Post and Line Caps: Designed to accommodate passage of top rail through cap.
- C. Tension and Brace Bands: No exceptions to ASTM F626.
- D. Tension Bars:
 - 1. One-piece.
 - 2. Length not less than 2 inches shorter than full height of chain link fabric.
 - 3. Provide one bar for each gate and end post, and two for each corner and pull post.

- E. Truss Rod Assembly: 3/8-inch diameter, steel, hot-dip galvanized after threading rod and turnbuckle or other means of adjustment.
- F. Tie Wires, Clips, and Fasteners: According to ASTM F626.

2.6 GATES

A. General:

- 1. Gate Operation: Opened and closed easily by one person.
- 2. Metal Pipe and Tubing: Galvanized steel. Comply with ASTM F1043 and ASTM F1083 for materials and protective coatings.
- 3. Frames and Bracing: Fabricate members from round galvanized steel tubing with outside dimension and weight according to ASTM F900.
- 4. Gate Fabric Height: Same as for adjacent fence height.
- 5. Welded Steel Joints: Paint with zinc-based paint.
- 6. Chain Link Fabric: Attached securely to gate frame at intervals not exceeding 15 inches.
- 7. Latches: Arranged for padlocking so padlock will be accessible from both sides of gate.

B. Swing Gates: Comply with ASTM F900 for single swing gate types.

- 1. Leaf Width: 30 inches.
- 2. Hinges: Offset type, malleable iron.
 - a. Furnished with large bearing surfaces for clamping in position.
 - b. Designed to swing either 180 degrees outward, 180 degrees inward, or 90 degrees in or out, and not twist or turn under action of gate.
- 3. Latches: Plunger bar arranged to engage stop, except single gates of openings less than 10 feet wide may each have forked latch.
- 4. Locking Device and Padlock Eyes: Integral part of latch.

2.7 CONCRETE

- A. Materials: ASTM C387, packaged, dry, combined ingredients with Type I cement.
- B. Mixing: In a clean metal container, mix package of dry materials by hand or machine. Following manufacturer's instructions, add clean water in sufficient

quantity to produce a slump of 2 inches to 3 inches.

2.8 FENCE GROUNDING

- A. Conductors: Bare, solid wire for No. 6 AWG and smaller; stranded wire for No. 4 AWG and larger.
 - 1. Material above Finished Grade: Copper.
 - 2. Material on or below Finished Grade: Copper.
 - 3. Bonding Jumpers: Braided copper tape, 1-inch wide, woven of No. 30 AWG bare copper wire, terminated with copper ferrules.
- B. Connectors and Grounding Rods: Comply with UL 467.
 - 1. Connectors for Below-Grade Use: Exothermic welded type.
 - 2. Grounding Rods: Copper-clad steel.

PART3-EXECUTION

3.1 GENERAL

- A. Install chain link fences and gates in accordance with ASTM F567, except as modified in this section, and in accordance with fence manufacturer's recommendations, as approved by Engineer. Erect fencing in straight lines between angle points.
- B. Provide necessary hardware for a complete fence and gate installation.
- C. Any damage to galvanized surfaces, including welding, shall be repaired with paint containing zinc dust in accordance with ASTM A780.

3.2 PREPARATION

- A. Clear area on either side of fence. Eliminate ground surface irregularities along fence line to the extent necessary to maintain a 2-inch clearance between bottom of fabric and finish grade.
- B. Stake locations of fence lines, gates, and terminal posts. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, property monuments, and dockwall tiebacks.

3.3 POST SETTING

- A. Set or drive posts, in a vertical position, at the required location and alignment, and as uniform a spacing as conditions allow. Space posts to miss dockwall tiebacks.

- B. Posthole Depth:
 - 1. Minimum 3 feet below finished grade.
- C. Set posts with minimum embedment below finished grade of 34 inches and with top rail at proper height above finished grade. Verify posts are set plumb, aligned, and at correct height and spacing. Brace posts, as necessary, to maintain correct position and plumbness until concrete sets.
- D. Backfill postholes with concrete to 2 inches above finished grade. Vibrate or tamp concrete for consolidation. Protect above ground portion of posts from concrete splatter.
- E. Before concrete sets, crown and finish top of concrete to readily shed water.
- F. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more.
- G. Line Posts: Space line posts uniformly at 10 feet on centers between terminal end, corner, and gate posts.

3.4 POST BRACING

- A. Install according to ASTM F567, maintaining plumb position, and alignment of fencing. Install braces at gate, end, pull, and corner posts diagonally to adjacent line posts to ensure stability. Install braces on both sides of corner and pull posts.
 - 1. Locate horizontal braces at mid-height of fabric or higher, on fences with top rail, and 2/3-fabric height on fences without top rail. Install so posts are plumb when diagonal truss rod assembly is under proper tension.

3.5 TOP RAILS

- A. Install according to ASTM F567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps and terminating into rail end attached to posts or posts caps fabricated to receive rail at terminal posts.

3.6 CHAIN LINK FABRIC

- A. Do not install fabric until concrete has cured minimum 7 days.
- B. Install fabric with twisted and barbed selvage at top.
- C. Apply fabric to outside of enclosing framework. Pull fabric taut to provide a smooth and uniform appearance free from sag, without permanently distorting fabric diamond or reducing fabric height. Tie fabric to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

- D. Splicing shall be accomplished according to ASTM F1916 by weaving a single picket into the ends of the rolls to be joined.
- E. Leave 2 inches between finish grade or surface and bottom selvage, unless otherwise indicated.
- F. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches on center.
- G. Tie Wires: Fasten ties to wrap a full 360 degrees around rail or post and a minimum of one complete diamond of fabric. Twist ends of tie wire three full twists, and cut off protruding ends to preclude untwisting by hand.
 - 1. Maximum Spacing: Tie fabric to line posts at 12 inches on center and to brace and top rails at 24 inches on center.

3.7 GATES

- A. Install gates level, plumb and secure for full opening without interference.

3.8 ELECTRICAL GROUNDING

- A. Ground fences at a maximum interval of 1,000 feet in accordance with applicable requirements of IEEE C2, National Electrical Safety Code.
- B. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a maximum distance of 150 feet on each side of crossing.
- C. Grounding Method: At each grounding location, drive a grounding rod vertically until top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.

END OF SECTION 02821

SECTION 03300 CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete reinforcement and accessories.
2. Cast-in-place concrete.
3. Curing and Treatment Requirements.

B. Work Installed But Furnished Under Other Sections:

1. Section 02459 - Concrete Filled Steel Piles: Concrete fill.
2. Section 05120 - Structural Steel.

1.2 REFERENCES

A. American Concrete Institute (ACI):

1. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials.
2. ACI 301 - Specifications of Structural Concrete for Buildings.
3. ACI 304.2R - Placing Concrete by Pumping Methods.
4. ACI 305 - Hot Weather Concreting.
5. ACI 306 - Cold Weather Concreting.
6. ACI 315 - Details and Detailing of Concrete Reinforcement.
7. ACI 318 - Building Code Requirements for Reinforced Concrete.

B. American Society for Testing and Materials (ASTM International):

1. ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.
2. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.
3. ASTM A767 - Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
4. ASTM A775 - Epoxy-Coated Reinforcing Steel Bars.
5. ASTM C33 - Concrete Aggregates.
6. ASTM C94 - Ready-Mixed Concrete.
7. ASTM C150 - Portland Cement.
8. ASTM C260 - Air Entraining Admixtures for Concrete.
9. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
10. ASTM C494 - Chemical Admixtures for Concrete.
11. ASTM C618 - Fly Ash as Admixture for Concrete.
12. ASTM D2103 - Polyethylene Film and Sheeting.

1.3 SUBMITTALS

A. Submit shop drawings of reinforcing steel under provisions of Section 01330.

B. Initial submittal of reinforcement shop drawings shall be complete. No partial

submittals will be accepted.

- C. Indicate reinforcement sizes, spacings, locations and quantities of reinforcing steel, bending and cutting schedules, splicing, supporting and spacing devices.
- D. Submit proposed mix design of each class of concrete to Owner not later than ten days after Notice to Proceed.

1.4 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301, 305, 306.
- B. Maintain copy of ACI 301 on site.

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. Placement and curing of concrete where (1) average daily temperature for three consecutive days is less than 30 32-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.
- B. Placement and curing of concrete subject to a combination of rising air temperature (generally greater than 75 degrees F) and low relative humidity and wind shall be in accordance with ACT 305.

PART 2-PRODUCTS

2.1 REINFORCING STEEL

- A. Reinforcing Steel: ASTM A615, 60 ksi yield grade billet steel deformed bars; all reinforcing shall be epoxy coated in accordance with ASTM A775.
- B. Welded Steel Wire Fabric: Plain type, ASTM A185; in flat sheets; or coiled rolls; uncoated.

2.2 CONCRETE MATERIALS

- A. Cement: ASTM C150, Portland, gray color.
- B. Fine and Coarse Aggregates: ASTM C33.
- C. Water: Clean and not detrimental to concrete.

2.3 CHEMICAL ADMIXTURES

- A. Chemical admixtures shall be in accordance with ASTM C494.
- B. Concrete may contain a Type A Water-reducing admixture, a Type D Water-reducing and/or a retarding admixture.
- C. Admixtures are to be used in accordance with manufacturer's recommendations.
- D. Chemical admixtures containing chlorides, sulfides, or nitrides are not permitted.
- E. A single manufacturer shall supply permitted admixtures.
- F. Admixture manufacturer's are to be approved in writing by Architect/Engineer prior to use.

2.4 ADMIXTURES

- A. Air Entrainment Admixture: ASTM C260.
- B. Flyash: Class C in accordance with ASTM C618.

2.5 ACCESSORIES

- A. Vapor Barrier: ASTM D2103, 6-mil thick clear polyethylene film.
- B. Non-Shrink Grout: Premixed compound with non-metallic aggregate, cement, water reducing and plasticizing agents; capable of minimum compressive strength of 2400 psi.
- C. Joint Filler: ASTM D1751, Bituminous fiber, 1/2-inch wide by depth of concrete less 1/8-inch.
- D. 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, as manufactured by Symons Company "Magic Coat"; W. R. Meadows "Duogard"; or Sonneborn "Castoff."

2.6 CURING AND TREATMENT MATERIALS

- A. Water: Potable and clean.
- B. Membrane Curing Compound: ASTM C309; Type I free of oil, wax, or grease as manufactured by Sonneborn, "Kure-N-Seal"; W. R. Meadows, 'CS 309"; Dayton Superior, "J20 Acrylic Cure & Seal"; Master Builders, "Mastercure"; T. K. Products, "AchroKure AK-2."
- C. Liquid Hardener: Sonneborn, "Lapidolith"; W. R. Meadows, "Penna-Litch"; Dayton Superior, "J-15 Plulosilicate"; T. K. Products "Tri-A-Lith Builders"; Hardeners and sealers used shall be of same manufacturer.

- D. Sealers: Sonneborn, "Kure-N-Sear; W. R. Meadows, "Tiah"; Dayton Superior, "J25 Sealer"; Master Builders, "Mastercure (CR)"; T. K. Products, "Bright Seal." Hardeners and sealer used shall be of same manufacturer.
- E. Non-Slip Aggregate: Sonneborn, "Frictex"; Antri-Hydro Co., "Natural Aluminum Oxide."
- F. Polyethylene Film: ASTM D2103, 6 mil thick, clear.

2.7 CONCRETE MIX

- A. Mix concrete in accordance with ASTM C94.

B. Schedule of Mixes:

Class	Name	Max. Agg. Size (in.)	Max. Slump** (inch)	Min. Cement Lbs/cu.yd.	Min, Comp Strength (psi/28 days)	Max. Water/ Cement Ratio
2	Fill For Pipe Piles	1-1 /2	5	447	3000	

* Air Entrained Concrete Mix. Normal Acceptable range of air content 5%-7%.

**Slump Tolerance 3 and 4 inch slump plus 1 inch minus ½ inch. 5 inch slump plus or minus 1 inch

- C. Concrete mix designs shall be designed and submitted in accordance with Section 01330 and included as part of cost of this Work.
- D. Mix designs shall be prepared by a qualified agency acceptable to Owner/Engineer. Six (6) copies of mix designs shall be submitted for Owner/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 agents to control slumps required for pumping of concrete. Strength, placing and finishing requirements shall be maintained.
- H. Minimum cement contents listed in Schedule of Mixes are based on use of water reducing agents specified. Mixes without water reducing agents will require a 12 percent increase in cement content.
- I. Cement content for mix 2 may be reduced by 1/2 sack per cubic yards if 100 pounds of fly ash is added to each cubic yard of concrete.

PART3-EXECUTION

3.1 REINFORCEMENT

- A. Place, support, and secure reinforcement against displacement.
- B. Locate reinforcing splices as shown on Drawings.
- C. Cut ends of epoxy coated rebar shall be coated with epoxy material equivalent to factory coating.
- D. Damage to rebar coating as a result of bending shall be repaired with equivalent coating.

3.2 PLACING CONCRETE

- A. Notify Owner/Engineer a minimum of 24 hours prior to commencement of concreting operations.
- B. Failure to notify Owner/Engineer may result in rejection of concrete placed without observation.
- C. Place concrete in accordance with ACT 301.
- D. Place pumped concrete in accordance with ACT 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 will be rejected and replaced at no cost to OWNER which has excessive honeycomb or embedded debris.
- G. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures and mechanical injury.
- H. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

3.3 TOLERANCES

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

3.4 FIELD QUALITY CONTROL

- A. Testing and analysis of concrete will be performed under provisions of Section 01400.
- B. Testing firm will take cylinders and perform slump and air entrainment tests in

accordance with ACI 301.

- C. Three concrete test cylinders shall be taken 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.
- D. One additional test cylinder will be taken during cold weather 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 taken.

END OF SECTION 03300

SECTION 05120 STRUCTURAL STEEL

PART 1 -GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fabrication, transportation, delivery, and erection of structural steel.
2. Structural steel, struts, bracing, welds, shear stud connectors, and fasteners.
3. Base plates, anchor rods, bearing plates, setting plates, and anchors.
4. Ladder.
5. Galvanizing of structural steel.
6. Stainless Steel Slip-Resistant Deck Cover Plates.

B. Related Sections:

1. Section 02459 - Concrete Filled Steel Piles.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM International):

1. ASTM A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
2. ASTM A108 – Steel Bars, Carbon, Cold-Finished, Standard Quality.
3. ASTM A123 – Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products.
4. ASTM A143 – Safeguarding against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
5. ASTM A153 - Zinc Coating (Hot Dip) on Iron and Steel Hardware.
6. ASTM A276 – Stainless Steel AISI Type 304
7. ASTM A307 - Carbon Steel Bolts and Studs, 60000 PSI Tensile Strength.
8. ASTM A325 - Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
9. ASTM A384 – Safeguarding Against Warpage and Distortion during Hot-Dip Galvanizing of Steel Assemblies.
10. ASTM A385 – Providing High-Quality Zinc Coatings (Hot-Dip).
11. ASTM A490 – Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile

Strength.

12. ASTM A500 – Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.

13. ASTM A501 – Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

14. ASTM A572 – High Strength Low Alloy Structural Steel.

15. ASTM A780 – Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

16. ASTM A992 – Steel for Structural Shapes For Use in Building Framing.

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 - Specification for Structural Steel Buildings, Allowable Stress Design and Plastic Design.

2. AISC - Code of Standard Practice for Steel Buildings and Bridges.

3. AISC - Specification for Architectural Exposed Structural Steel.

D. RCSC - Research Council on Structural Connections

1. RCSC - Specification for Structural Joints Using ASTM A325 or A490 Bolts.

E. SSPC - Society for Protective Coatings

1. SSPC - Steel Structures Painting Council. Steel Structures Painting Manual, Vol. 1 and 2.

2. SP-1- Solvent Cleaning.

3. SP-3 - Power Tool Cleaning.

4. SP-6 - Commercial Blast Cleaning.

F. American Galvanizers Association (AGA): AGA-Quality Assurance Manual.

1.3 SUBMITTALS

- A. Section 01300: Submittals: Submittal procedures.
- B. Shop and Erection Drawings:
 - 1. Indicate profiles, sizes, spacing, and locations of structural steel elements, openings, attachments, and fasteners.
 - 2. Show all connections.
 - 3. Indicate welded connections with AWS A2.0 welding symbols. Indicate net weld lengths.
 - 4. Indicate cleaning and coating specifications.
 - 5. Assume responsibility for dimensional errors.
 - 6. Field verify dimensions affected by existing construction prior to submitting Shop Drawings and so note verified dimensions on shop drawings.
 - 7. Field verify existing anchor bolt placements and modify base plates to accommodate field conditions.
 - 8. Fabricator shall check shop drawings before Submittal.
 - 9. Shop drawings shall be prepared under supervision of a Professional Engineer registered in the State of Wisconsin.
 - 10. Provide holes for installation of other work.
 - 11. Any omission from shop drawings of any materials required by Contract Documents shall not relieve Contractor of responsibility of furnishing and installing such materials, even though shop drawings may have been reviewed and approved.
- C. Manufacturer's Mill Certificate: Submit under provisions of Section 01300 certifying that products meet or exceed specified requirements.
- D. Mill Test Reports: Submit under provisions of Section 01300 Manufacturer's Certificates, indicating structural strength, destructive and non-destructive test analysis.
- E. Welders Certificates: Submit under provisions of Section 01300 Manufacturer's Certificates, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.
- F. Hot-Dip Galvanizing: Certificate of compliance signed by galvanizer with description of material processed and ASTM standard used for coating.

- G. Stainless Steel Slip Resistant Cover Plates: Submit manufacturer’s data certifying that the product meets or exceeds specified requirements.

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.
- C. Galvanized Coating Applicator: Company specializing in hot-dip galvanizing after fabrication and following procedures of AGA’s Quality Assurance Manual.

1.5 QUALIFICATIONS

- A. Fabricator: Company specializing in performing the work of this Section with minimum five years experience.
- B. Erector: Company specializing in performing the work of this Section with minimum five years 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 Angles, Plates, Channels and Other Rolled Members: ASTM A572, $F_y = 50$ ksi.
- B. Bolts, Nuts, and Washers: ASTM A325 High-Strength Bolts with ASTM A563 heavy hex nuts and ASTM F436 washers; hot-dip galvanized finish; head markings on bolts, fully traceable; as manufactured by Nucor Fastener, St. Louis Screw & Bolt Co., Hayden Bolts or an approved equal.
- C. Welding Electrodes: E70XX and shall comply with AWS D1.1; type required for materials being welded.
- D. For hot-dip galvanized steel that is exposed to view limit combined phosphorous and silicon content to 0.04 percent. For steels that require a minimum of 0.15 percent silicon, such as plates over 1.5 inches thick for ASTM A36 and ASTM A572 steels, limit maximum silicon content to 0.21 percent and phosphorous content to 0.03 percent.

2.2 FABRICATION

- A. Fabricate items of structural steel in accordance with AISC specifications, and as shown on approved shop drawings.
- B. All steel framing connections are to be welded, unless other types of connections are indicated.
- 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. Minimum size of fillet welds shall be as specified in TABLE J2.4 of the AISC Manual of Steel Construction.
- F. 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.
- G. 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.
- H. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.
- I. Verify or supplement dimensions shown on Drawings by field measurements to assure fit of new work.
- J. Jointed members shall be sealed with continuous welds unless otherwise noted.
- K. Struts and Braces:
 - 1. Connections for all struts, hangers, and braces shall have connections designed to develop full allowable tensile strength of member unless design force is indicated on drawings.
- L. Galvanizing:
 - 1. Fabricate steel to be galvanized in accordance with ASTM A143, ASTM A384, and ASTM A385. Avoid fabrication techniques that could cause distortion or embrittlement of steel.
 - 2. Remove welding slag, splatter, burrs, grease, oil, paint, lacquer, and other deleterious material prior to delivery for galvanizing.
 - 3. Remove by blast cleaning or other methods surface contaminants and coatings not removable by normal chemical cleaning process in galvanizing operation.
 - 4. Hot-dip galvanize steel members, fabrications and assemblies after fabrication in accordance with ASTM A123.

5. Hot-dip galvanize ASTM A325 bolts, nuts, washers, and hardware components in accordance with ASTM A153. Oversize holes to allow for zinc alloy growth. Shop-assemble bolts, nuts, and washers with special lubricant and test in accordance with ASTM A325 and ASTM A563.
6. Galvanize components of bolted assemblies separately before assembly.

M. Galvanizing Quality Control

1. An independent testing agency shall be retained by Contractor and approved by Engineer to inspect and test hot-dip galvanized fabricated items in accordance with ASTM A123 and ASTM A153.
2. Visually inspect and test for thickness and adhesion of zinc coating for minimum of three test samples from each lot in accordance with ASTM A123 and A153.
3. Reject and retest nonconforming articles in accordance with ASTM A123 and ASTM A153.

N. Do not prime surfaces that will be field welded unless coated with a weldable primer.

O. Dockwall Ladder: The dockwall ladder shall be designed by the contractor and be in accordance with all local codes and ordinances. The ladder shall be galvanized.

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 steel piling has been placed 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. Grout solid under base plates, bearing plates, and leveling plates in accordance with AISC - Code of Standard Practice for Steel Buildings and Bridges.
- I. Contact surfaces of field connections shall be free from dust, oil, loose scale, burrs, pits, and other defects that prevent solid seating of parts.
- J. Reaming is not allowed if reaming weakens or makes it impossible to fill holes or adjust accurately after being reamed.
- K. All steel shall be isolated from dissimilar materials by means of a continuous separation material.

3.3 TOUCH UP AND FIELD REPAIR OF GALVANIZED COATINGS

- A. Hot-Dip Galvanized Coating Repair:
 - 1. Conform to ASTM A780.
 - 2. For minor repairs at abraded areas, use spayed zinc conforming to ASTM A780.
 - 3. For flame cut or welded areas, use zinc-based solder, or zinc sticks, conforming to ASTM A780.
 - 4. Use magnetic gauge to determine thickness is equal to or greater than base galvanized coating.

3.4 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From True Alignment: 1/4 inch.

3.5 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01400.

END OF SECTION 05120

SECTION 05521 - STEEL RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes painted steel pipe handrails and gate, tube, bar railings (guardrails) with stainless steel cable net infill panels, and railing anchorage. This Section includes handrails along the proposed riverwalk and alterations to the existing handrails.
- B. Related Sections include the following:
 - 1. Division 9 Section 09960 "High Performance Coatings" for painting of steel pipe handrails and railings.

1.3 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: Provide handrails and railings that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
- C. Lateral design forces- as per Wisconsin code, 50plf at top of rail, minimum.
- D. The railings shall match the style of the adjacent railings on the Renaissance and MIAD Riverwalks.
- E. The gate shall be designed per Wisconsin code and as shown on the plans.

1.4 SUBMITTALS

- A. Shop Drawings: Show fabrication and installation of handrails, railings, and gate. Include plans, elevations, sections, component details, and attachments to other Work.

1. All shop drawings are to be signed and sealed by a Professional Structural Engineer registered in the state of Wisconsin.
 2. Work will not be allowed to be installed until signed and sealed drawings have been received by the Owner.
- B. Samples for Verification: For each type of exposed finish required, prepared on components indicated below and of same thickness and metal indicated for the Work. If finishes involve normal color and texture variations, include sample sets showing the full range of variations expected.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of handrail and railing through one source from a single manufacturer.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of kind indicated. Engineering services are defined as those performed for installations of products that are similar to those indicated for this Project in material, design, and extent.

1.6 STORAGE

- A. Store handrails and railings in a dry, well-ventilated, weathertight place.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify handrail and railing dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating handrails and railings without field measurements. Fabricator shall coordinate dimensions based upon Steel Fabricator's underline shop drawings. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.8 COORDINATION

- A. Coordinate installation of anchorages for handrails and railings. Furnish setting drawings, templates, and directions for installing anchor bolts. Deliver such items to Project site in time for installation.

1.9 SCHEDULING

- A. Schedule installation so handrails and railings are mounted only on completed walkways. Do not support temporarily by any means that does not satisfy structural performance requirements.

PART 2 PRODUCTS

2.1 METALS

- A. General: Provide metal free from pitting, seam marks, roller marks, stains, discoloration, and other imperfections where exposed to view on finished units.
- B. Steel and Iron: Provide steel and iron in the form indicated, complying with the following requirements:
 - 1. Steel Pipe: ASTM A 53; finish, type, and weight class as follows:
 - a. Black finish, unless otherwise indicated.
 - b. Type F, or Type S, Grade A, standard weight (Schedule 40 or 80 depending on field conditions), unless another grade and weight are required by structural loads.
 - 2. Steel Tubing: Cold-formed steel tubing, ASTM A 500, Grade A, unless another grade is required by structural loads.
 - 3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.

2.2 CABLE NET INFILL PANELS

- A. Cable net infill panels shall be stainless steel "X-TEND 2" by Carl Stahl Cablevision (www.decorable.com) supplied by DecorCable Innovations of Chicago, Illinois, or approved equal.
 - 1. Mesh cable to be 1.5mm stainless steel.
 - 2. Mesh openings to be 60mm x 103.9mm at 60 degrees angle.
 - 3. Ferrules to be stainless steel.
- B. Mesh anchoring to be by stainless steel edging cables anchored to vertical posts at approximately 5' o.c. as shown on drawings. Cabling to be sized by Manufacturer for anchor spacing shown.
- C. Anchors for Edge Cabling to be Manufacturer's standard stainless steel anchors and turn buckles as required for a complete system.
- D. Provide stainless steel bar edge framing in lieu of edge cabling as shown on detail drawings. Top and bottom tubes are to be curved to match top pipe rail of railing system as shown on drawings. Tubes are to be anchored to vertical posts with Manufacturer's standard stainless steel anchors.

2.3 WELDING MATERIALS, FASTENERS, AND ANCHORS

- A. Welding Electrodes and Filler Metal: Provide type and alloy of filler metal and electrodes as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.
- B. Fasteners for Anchoring Handrails and Railings to Other Construction: Provide stainless steel fasteners of type, grade, and class required to produce connections suitable for anchoring handrails and railings to other types of construction indicated and capable of withstanding design loads.
- C. Fasteners for Interconnecting Handrail and Railing Components: Use fasteners fabricated from same basic metal as fastened metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.
 - 1. Provide concealed fasteners for interconnecting handrail and railing components and for attaching them to other work, unless otherwise indicated.
 - 2. Provide concealed fasteners for interconnecting handrail and railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for handrails and railings indicated.

2.4 PAINT

- A. Shop Primers: Provide primers to comply with applicable requirements in Division 9 Section 09960 "High Performance Coating."
 - 1. Shop applied primer: Products of either of the following companies:
 - a. Carboline Company: Carbo Zinc 11; Inorganic Zinc Rich Primer, or approved equal.
 - 2. Provide primer from same manufacturer as top coat(s) per requirements of 09960.

2.5 FABRICATION

- A. General: Fabricate handrails, railings and gate to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Assemble handrails, railings, and gate in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Form changes in direction of railing members by radius bends of radius indicated.
- D. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.

1. Handrail and guardrails for straight riverwalk shall be fabricated with schedule 40 tubing.
- E. Welded Connections: Fabricate handrails, railings, and gate for connecting members by welding. Cope components at perpendicular and skew connections to provide close fit, or use fittings designed for this purpose. Weld connections continuously to comply with the following:
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove flux immediately.
 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- F. Brackets, Flanges, Fittings, and Anchors: Provide, flanges, miscellaneous fittings, and anchors to interconnect handrail and railing members to other work, unless otherwise indicated.
- G. Shear and punch metals cleanly and accurately. Remove burrs from exposed cut edges.
- H. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Foil bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.
- I. Cut, reinforce, drill, and tap components, as indicated, to receive finish hardware, screws, and similar items.
- J. Provide weep holes or another means to drain entrapped water in hollow sections of handrail and railing members that are exposed to exterior or to moisture from condensation or other sources.
- K. Fabricate joints that will be exposed to weather in a watertight manner.
- L. Close exposed ends of handrail and railing members with prefabricated end fittings.

2.6 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Provide exposed fasteners with finish matching appearance, including color and texture, of handrails and railings.

2.7 STEEL FINISHES

- A. For nongalvanized steel handrails and railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors to be embedded in exterior concrete or masonry.
- B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface-preparation specifications and environmental exposure conditions of installed handrails and railings:
 - 1. Exteriors: SSPC-SP 10, "Near-White Blast Cleaning."
- C. Apply shop primer to prepared surfaces of handrail and railing components, unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry. Refer to Division 9 Section 09960 "High Performance Coatings" for painting direction.
 - 1. Where required, apply primer to galvanized surfaces.
 - 2. Stripe paint edges, corners, crevices, bolts, and welds.

PART3-EXECUTION

3.1 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required to install handrails, railings, and gate. Set handrails and railings accurately in location, alignment, and elevation; measured from established lines and levels and free from rack.
 - 1. Do not weld, cut, or abrade surfaces of handrail and railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 - 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 - 3. Align rails so variations from level for horizontal members and from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- C. Adjust handrails and railings before anchoring to ensure matching alignment at abutting joints. Space posts at interval indicated, but not less than that required by structural loads.
- D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing handrails and railings and for properly transferring loads to in-place construction.

3.2 RAILING CONNECTIONS

- A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.
- B. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 1.5 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint as shown on plans.

3.3 ANCHORING POSTS

- A. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.
- B. Leave anchorage joint exposed; wipe off surplus anchoring material; and leave 1/8-inch build-up, sloped away from post.
- C. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to supporting members as follows:
 - 1. For steel pipe railings, weld flanges to post and bolt to supporting surfaces.

3.4 CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9 Section 09960 "High Performance Coatings."

3.5 PROTECTION

- A. Protect finishes of handrails and railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at the time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

3.6 ALTERATIONS TO EXISTING RAILING

- A. The Contractor shall perform alternations to the existing hand railings of the Renaissance and MIAD Riverwalks to provides for an 8-foot wide opening for the proposed Riverwalk. Replace/relocate existing posts, mesh, rails, attachments and all accessories.

END OF SECTION 05521

SECTION 06100 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Framing with dimension lumber.
 - 2. Wood blocking and nailers.
 - 3. Wood furring.
- B. Related Sections include the following:
 - 1. Division 6 Section 06150 "Wood Decking" for nonstructural wood decking items exposed to view and not specified in another Section.
 - 2. Division 6 Section 06173 "Parallel Strand Lumber Construction" for structural wood framing

1.3 DEFINITIONS

- A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise indicated.
- B. Exposed Framing: Dimension lumber not concealed by other construction.
- C. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 - 1. NELMA - Northeastern Lumber Manufacturers Association.
 - 2. NLGA - National Lumber Grades Authority.
 - 3. WCLIB - West Coast Lumber Inspection Bureau.
 - 4. WWPA - Western Wood Products Association.

1.4 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with

- requirements. Indicate type of preservative used, net amount of preservative retained, and chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
- B. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee Board of Review.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber, plywood, and other panels; place spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2-PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
1. Factory mark each piece of lumber with grade stamp of grading agency.
 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 3. Provide dressed lumber, S4S, unless otherwise indicated.
 4. Provide dry lumber with 15 percent maximum moisture content at time of dressing for 2- inch nominal thickness or less, unless otherwise indicated.

2.2 WOODPRESERVATIVE TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPA C2 (lumber), except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).

1. Preservative Chemicals: Acceptable to authorities having jurisdiction.
- B. Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
 1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece, or omit marking and provide certificates of treatment compliance issued by inspection agency.
- D. Application: Treat all rough carpentry, hidden from view unless otherwise indicated.
 1. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

2.3 DIMENSION LUMBER

- A. General: Provide dimension lumber of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.
- B. Framing Other Than Non-Load-Bearing Partitions: No. 2 grade and the following species:
 1. Spruce-pine-fir; NLGA.
- C. Exposed Framing: Provide material hand-selected for uniformity of appearance and freedom from characteristics that would impair finish appearance.
 1. Species and Grade: Spruce-pine-fir or Spruce-pine-fir (south), Select Structural grade; NELMA, NLGA, WCLIB, or WWPA.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide lumber for support or attachment of other construction, including the following:
 1. Blocking.
 2. Nailers.
 3. Furring.
- B. For items used for the purposes of blocking, nailers, sleepers or other like conditions located of land and considered easily accessible, provide No. 2 Spruce/Pine/Fir lumber with 15 percent maximum moisture content. Wood shall be chemically treated with a treatment system designed to be in continuous contact with ground.

- C. For concealed blocking, nailers, sleepers or other like conditions located over water, behind permanent and/or fixed objects or as designated on drawings, provide Parallam lumber treated as specified in Section 06173 "Parallam Strand Lumber Construction."
- D. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.5 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide stainless steel fasteners complying with referenced standards listed below.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: CABO NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.
- F. Lag Bolts: ASME B18.2.1..
- G. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
- H. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
 - 2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

2.6 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.
- B. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing

3-iodo-2- propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.

PART3-EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Do not use materials with defects that impair quality of rough carpentry or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- C. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.
- D. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. CABO NER-272 for power-driven fasteners.
 - 2. Table 2305.2, "Fastening Schedule," in the BOCA National Building Code.
- E. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.
- F. Use finishing nails for exposed work, unless otherwise indicated. Countersink nail heads and fill holes with wood filler.

3.2 WOOD SLEEPER, BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated. Build anchor bolts into masonry during installation of masonry work. Where possible, secure anchor bolts to formwork before concrete placement.

3.3 WOOD FRAMING INSTALLATION, GENERAL

- A. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.
- B. Do not splice structural members between supports.

3.4 FLOOR JOIST FRAMING INSTALLATION

- A. General: Install floor joists with crown edge up and support ends of each member with not less than 1-1/2 inches of bearing on wood or metal, or 3 inches on masonry. Attach floor joists as follows:
 - 1. Where supported on wood members, by using metal framing anchors.
 - 2. Where framed into wood supporting members, by using wood ledgers as indicated or, if not indicated, by using metal joist hangers.
- B. Do not notch in middle third of joists; limit notches to one-sixth depth of joist, one-third at ends. Do not bore holes larger than 1/3 depth of joist; do not locate closer than 2 inches from top or bottom.
- C. Provide solid blocking of 2-inch nominal thickness by depth of joist at ends of joists unless nailed to header or band.
- D. Lap members framing from opposite sides of beams, girders, or partitions not less than 4 inches or securely tie opposing members together. Provide solid blocking of 2-inch nominal thickness by depth of joist over supports.
- E. Anchor members paralleling masonry with 1/4-by-1-1/4-inch metal strap anchors spaced not more than 96 inches o.c., extending over and fastening to 3 joists. Embed anchors at least 4 inches into grouted masonry with ends bent at right angles and extending 4 inches beyond bend.
- F. Provide solid blocking between joists under jamb studs for openings.
- G. Provide bridging of type indicated below, at intervals of 96 inches o.c., between joists.
 - 1. Diagonal wood bridging formed from bevel-cut, 1-by-3-inch nominal- size lumber, double-crossed and nailed at both ends to joists.

3.5 STAIR FRAMING INSTALLATION

- A. Provide stair framing members of size, space, and configuration indicated or, if not indicated, to comply with the following requirements:
 - 1. Stringer Size: 2-by-12-inch nominal- size, minimum.
 - 2. Notching: Notch stringers to receive treads, risers, and supports; leave at least 3-1/2 inches of effective depth.
 - 3. Stringer Spacing: At least 3 stringers for each 36-inch clear width of stair.
- B. Provide stair framing with no more than 3/16-inch variation between adjacent treads and risers and no more than 3/8-inch variation between largest and smallest treads and risers within each flight.

END OF SECTION 06100

SECTION 06150 - WOOD DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Solid-wood decking.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 6 Section 06713 "Parallel Strand Lumber Construction" for girders, beams and purlins.

1.3 SUBMITTALS

- A. Samples: Provide 3 samples 24 inches long of each surface treatment, showing the full range of variation to be expected in appearance of wood decking.
- B. For wood products, provide evidence of compliance with standards endorsed by the Forest Stewardship Council and as follows:
 - 1. Indicate certified status of forest of origin.
 - 2. Indicate chain of custody from forest of origin through manufacturing and fabrication.
 - a. Submit prior to fabrication and installation. Wood products for which acceptable documentation is not submitted will be rejected and their removal required.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who has completed wood decking installation similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Decking Material Standard: Comply with Certified Forest Product Council best practices and the following standards;
 - 1. Green Cross Certification Program: administered by Scientific Certification Systems(SCS).

2. SmartWood Certification Program: Administered by Rainforest Alliance.
 3. Societe Generale de Surveillance (SGS) Forestry Qualifor Programme; administered by Oxford Centre for Innovation.
 4. The Responsible Forestry Program: Administered under Soil Association's Woodmark Scheme.
 5. SKAL Forestry Certification Programme: Administered by SKAL.
- C. Source: Material shall be obtained from Timber Holdings Intl., Milwaukee, Wisconsin (414) 445-8989 (www.ironwoods.com).

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Schedule delivery of wood decking to avoid extended on-site storage and to avoid delaying the work.
- B. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Provide for air circulation within and around stacks and under temporary coverings.

PART2-PRODUCTS

2.1 SOLID WOOD DECKING

- A. Decking Species: Ipe (Tabebuia spp. Lapacho Group).
- B. Decking Grade: Select(ed) Clear All Heart Decking.
 1. Lumber shall be graded both faces, and both edges.
 2. Lumber shall be straight grained and parallel cut without heart center.
 3. Lumber shall be all heartwood, no sapwood allowed.
 4. Lumber shall be in sound condition, free from worm holes or knots.
 5. Allowable Imperfections: Small drying cracks, small end splits (less than 5/32" in width), that do not impair the strength of the material or fasteners, Slight discoloration due to weathering, Bow or Spring which can be removed using normal installation methods and tools.
 6. Not Allowable Imperfections: Longitudinal heart cracks, Internal cracks, Firm or soft sapwood, Fungi evidence.
- C. Moisture Content: Provide wood decking with 15 percent maximum moisture content at time of dressing.
- D. Dimensional Tolerance: All wood decking to be supplied at plus/minus .06" in both width and thickness.
- E. Pattern and Dressing: All decking wood to be supplied S4S-E4E (Surfaced 4 sides, eased 4 sides) unless noted on drawings as "grooved". Grooved decking to be S4S-

E4E plus groove routed top face with nine (9) routed V grooves per 5-1/4" wide board.

- F. Over-lengths: All wood decking to be supplied two inches (2") min. over the specified length, to allow for final trim and proper field fit.
- G. End Coating: All wood decking to be supplied with the ends sealed with Mobil CER-M, or approved equal aqueous wax log end sealer.
- H. Fasteners: Provide fastener size and type complying with decking standard for thickness of deck used. All fasteners to be stainless steel.

2.2 FABRICATION

- A. Fabricate decking in lengths for controlled random lay-up. Supply decking in lengths suitable to achieve design intent indicated on drawings.
- B. Seal Coat: All decking is to be supplied with the end sealed with Mobile CER-M or equal aqueous wax log end sealer.
- C. Predrill decking for all fasteners to comply with referenced decking standard.
- D. Pre-route all surface grooves on boards designated as "grooved".

PART 3-EXECUTION

3.1 INSTALLATION

- A. Install solid wood decking to comply with referenced decking standard and with end joints located according to lay-up indicated. Apply joint sealant between decking and supports and between tongues and grooves at outside wall supports.

3.2 ADJUSTING AND CLEANING

- A. Repair damaged surfaces and finishes after completing erection. Replace damaged decking if repairs are not approved by Owner.

3.3 PROTECTION

- A. Provide temporary waterproof covering to protect exposed decking before installation.

END OF SECTION 06150

SECTION 06173 PARALLEL STRAND LUMBER CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Parallel strand lumber beams and purlins; preservative treatment of wood.
2. Stainless steel hardware and attachment brackets for the above items.

B. Related Sections:

1. Section 02459 - Concrete Filled Steel Piles.
2. Section 06150 - Wood Decking.

1.2 REFERENCES

A. American Institute of Timber Construction (ATTC)

1. AITC 117 - Structural Glue-Laminated Timber of Softwood Species - Design and Manufacturing.

B. American National Standards Institute (ANSI)

1. ANSI A190.1 - Structural Glued Laminated Timber.

C. APA/Engineered Wood Association (APA/EWS)

1. APA/EWS - Engineered Wood Systems - NER 481 - Parallel Strand Lumber.

D. American Society for Testing and Materials (ASTM International)

1. ASTM D2559 - Adhesives for Structural Laminated Wood Products for Use Under Exterior (Wet Use) Exposure Conditions.

E. American Wood Preservers Association (AWPA)

1. AWPA C1 - All Timber Products Preservative Treatment by Pressure Process.

1.3 SUBMITTALS

A. Section 01330 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit technical data on materials.

C. Shop Drawings: Indicate framing system, sizes and spacing of members, bearing and anchor details, locations of shop drilled and permissible field drilled holes, locations and details of hardware and attachment brackets. All drawings to be signed and

sealed by a Professional Structural Engineer, registered in the State of Wisconsin.

D. Submit design calculations for connections and attachment brackets.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with manufacturer's recommendations.

1.5 QUALIFICATIONS

A. Manufacturer/Fabricator: Company specializing in manufacture of parallel strand lumber structural units with five years experience.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01700 Execution Requirements: Product storage and handling requirements.

PART 2-PRODUCTS

2.1 MATERIALS

A. Manufacturers:

1. Weyerhaeuser (formerly Trus Joist MacMillan) - Parallam Parallel Strand Lumber.
2. Or approved equal.

B. Minimum property requirements for Service Level 3 and 100% Load Duration.

- | | |
|---|------------------------------|
| 1. Shear Modulus of elasticity | G=112,5000 psi |
| 2. Modulus of elasticity | E=1.64 x 10 ⁶ psi |
| 3. Flexural stress | F _b = 1,915 psi |
| 4. Compression perpendicular to grain parallel to glue line | F _{cI} =315 psi |
| 5. Compression parallel to grain | F _{cII} =1,275 psi |
| 6. Horizontal shear perpendicular to glue line | F _v =160 psi |
| 7. Creep Factor | =1.85 |

C. Structural Framing Connectors and Hangers: Design under the direct supervision of a Licensed Professional Engineer for the loads indicated on the drawings. Fabricate from Type 302 or 304/304L Stainless Steel.

2.2 FABRICATION

A. Parallel strand lumber shall be manufactured under the supervision of an approved third-party inspection agency. It shall be manufactured in a continuous process with all grain parallel with the length of the members. All members are to be free of finger or scarf joints or mechanical connections in full-length members.

- B. Verify dimensions and site conditions prior to fabrication.
- C. Cut and fit members accurately to length to achieve joint fit.
- D. Do not splice or join members in locations other than those indicated without permission.
- E. Fabricate stainless steel hardware and connections with joints neatly fitted, welded, and ground smooth.

2.3 PRESERVATIVE TREATMENT

- A. Treatment to be appropriate for Service Level 3 conditions in fresh water and in accordance with all applicable environmental regulations.
- B. All members shall be pressure treated with Pentachlorophenol.
- C. Preservative carrier to be a light colored oil.
- D. Minimum retention level of preservative: 0.4 lbs./cubic foot.
- E. Apply a sealer, recommended by the manufacturer, to the top surface of all members.

PART 3-EXECUTION

3.1 EXAMINATION

- A. Section 01310 - Project Management and Coordination.
- B. Verify supports are ready to receive units.
- C. Verify sufficient end bearing area.

3.2 PREPARATION

- A. Coordinate placement of bearing and support items.

3.3 ERECTION

- A. Erection of parallel strand lumber shall be under the direction of a qualified construction supervisor.
- B. Lift members using protective straps to prevent visible damage.
- C. Set structural members level and plumb, in correct positions or sloped where indicated.
- D. Install temporary bracing and anchorage to hold members in place until permanently

secured.

- E. Field trim to fit together accurately and as illustrated in the Contract Documents and/or approved shop drawings.
- F. The installed members shall be reviewed and approved by the manufacturer prior to installing the wood decking.

3.4 TOLERANCES

- A. Section 01400 - Quality Requirements: Tolerances.
- B. Framing Members: 1/4 inch maximum from indicated position.

3.5 WARRANTY

- A. The products delivered shall be free from manufacturing errors or defects in workmanship and material. The products, when correctly installed, shall perform to the manufacturer's specifications for a period of 40 years.

END OF SECTION 06173

SECTION 09960 - HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes surface preparation and shop and field application of high-performance coating systems to items and surfaces scheduled.
- B. Related Sections include the following:
 - 1. Division 5 Section 05521 "Steel Railings" for painting hand and guardrails, including existing handrails that require field touch-up.

1.3 DEFINITIONS

- A. Standard coating terms defined in ASTM D 16 apply to this Section.
- B. Gloss ranges used in this Section include the following:
 - 1. Semigloss refers to medium-sheen finish with a gloss range between 30 and 65 when measured at a 60-degree meter.
- C. Environments: The following terms are used in Part 2 of this Section to distinguish between different corrosive exposures:
 - 1. "Moderate environments" are corrosive industrial atmospheres with intermittent exposure to high humidity and condensation, occasional mold and mildew development, and regular cleaning with strong chemicals. Environments with exposure to heavy concentrations of chemical fumes and occasional splashing and spilling of chemical products are moderate environments.

1.4 SUBMITTALS

- A. Product Data: For each coating system indicated. Include block fillers and primers.
 - 1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference the specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
 - 2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each material

specified.

- B. Certification by manufacturer that products supplied comply with requirements indicated that limit the amount of VOCs in coating products.
- C. Samples for Verifications: For each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate.
 - 1. Provide stepped Samples defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
 - 2. List of material and application for each coat of each sample. Label each sample for location and application.
 - 3. Submit samples on the following substrates for Owner's review of color and texture:
 - a. Ferrous Metal: Provide two 4-inch- square samples of flat metal and two 8-inch-long samples of solid metal for each color and finish.
- D. 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.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage an experienced applicator who has completed high-performance coating system applications similar in material and extent to those indicated for Project and whose work has a record of successful in-service performance.
- B. Source Limitations: Obtain primers and undercoat materials for each coating system from the same manufacturer as the finish coats.
- C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample of each type of coating and substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample Submittals.
 - 1. Applicator shall demonstrate a full finish system application of the selected manufacturer on field mock up unit. Coordinate finish preparation and final application with all parties required.
 - 2. After permanent lighting and other environmental services have been activated, apply coatings to each surface as specified. Provide the required sheen, color, and texture of each surface.
 - a. After finishes are accepted, Owner will use the surface to evaluate coating

systems of a similar nature.

3. Final approval of colors will be from benchmark samples.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label with the following information:

1. Name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.
8. Handling instructions and precautions.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.

1. Protect materials from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and applying coatings.

1.7 PROJECT CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 45 and 95 deg F.

B. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

1. Allow wet surfaces to dry thoroughly and attain temperature and conditions specified before proceeding with or continuing coating operation.
2. Work may continue during inclement weather only if areas and surfaces to be coated are enclosed and temperature within the area can be maintained within limits specified by manufacturer during application and drying periods.

C. In the event that project schedule requires application of coatings when temperature or atmosphere requirements cannot be met, contractor shall tent, heat and protect surfaces to achieve proper application conditions.

1.8 EXTRA MATERIALS

- A. Furnish extra high-performance coating materials from the same production run as materials applied and in quantities described below. Package coating materials in unopened, factory- sealed containers for storage and identify with labels describing contents.
 - 1. Quantity: Furnish an additional 5 percent, but not less than 1 gal. or 1 case, as appropriate, of each material and color applied.

PART 2-PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products indicated in the coating system descriptions. Substitutions for manufacturer or material are not accepted.
- B. Manufacturers' Names: The following manufacturers are referred to in the coating system descriptions by shortened versions of their names shown in parenthesis:
 - 1. Carboline Company (Carboline), or approved equal.

2.2 COATINGS MATERIALS, GENERAL

- A. Material Compatibility: Provide primers, undercoats, and finish-coat materials that are compatible with one another and substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's highest grade of the various high-performance coatings specified. Materials not displaying manufacturer's product identification are not acceptable.
 - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- C. VOC Classification: Provide high-performance coating materials, including primers, undercoats, and finish-coat materials, that have a VOC classification of 450 g/L or less.

2.3 COLORS

- A. Colors: Black with Semi-Gloss clear coat.

2.4 EXTERIOR HIGH-PERFORMANCE COATING SYSTEMS

- A. Ferrous Metal: Provide the following finish systems over exterior ferrous-metal

surfaces:

1. Moderate Environment (Semigloss Finish): One finish coat over an intermediate coat and a primer.
 - a. Surface Preparation: Steel Structures Painting Council (SSPC) SP-10 Near-White Blast Cleaning.
 - b. Primer: Inorganic Zinc-Rich primer applied at spreading rate recommended by manufacturer.
 - 1) Carboline: Carbozinc 11 @ 3mills DFT minimum, or approved equal.
 - c. Intermediate Coat: Aliphatic. Polyurethane applied at spreading rate recommended by manufacturer to achieve a minimum dry film thickness of 3 mils.
 - 1) Provide coatings to match color, metallic fleck and finish based on Owner's sample.
 - 2) Architect will designate final locations and elements for color(s) to be applied
 - 3) Provide one of the following manufacturers. Manufacturer shall be same for all coats.
 - a. Carboline: Carbothane 133HB @ 3mils DFT minimum, or approved equal.
 - d. Topcoat: Aliphatic polyurethane enamel applied at spreading rate recommended by manufacturer to achieve a minimum dry film thickness of 2.0 mils.
 - 1) Carboline: Carboline 130 HB Clear Aliphatic Polyurethane at 2.0 mils DFT minimum. Gloss Finish, or approved equal.

PART 3-EXECUTION

3.1 EXAMINATION

- A. With Applicator present, examine substrates and conditions under which high-performance coatings will be applied, for compliance with coating application requirements.
 1. Apply coatings only after unsatisfactory conditions have been corrected and surfaces to receive coatings are thoroughly dry.
 2. Start of application is construed as Applicator's acceptance of surfaces within that particular area.

- B. Coordination of Work: Review other Sections in which primers or other coatings are provided to ensure compatibility of total systems for various substrates. On request, furnish information on characteristics of specified finish materials to ensure compatible primers.
1. If a potential incompatibility of primers applied by others exists, obtain the following from the primer Applicator before proceeding:
 - a. Confirmation of primer's suitability for expected service conditions.
 - b. Confirmation of primer's ability to be top coated with materials specified.
 2. Notify Owner about anticipated problems before using the coatings specified over substrates primed by others.

3.2 PREPARATION

- A. General: Remove plates, machined surfaces, and similar items already in place that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.
1. After completing coating operations, reinstall items that were removed; use workers skilled in the trades involved.
- B. Cleaning: Before applying high-performance coatings, clean substrates of substances that could impair bond of coatings. Remove oil and grease before cleaning.
1. Schedule cleaning and coating application so dust and other contaminants from cleaning process will not fall on wet, newly coated surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be coated according to manufacturer's written instructions for each substrate condition and as specified.
1. Provide barrier coats over incompatible primers or remove primers and reprime substrate.
 2. Ferrous-Metal Substrates: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC recommendations.
 - a. Blast-clean steel surfaces as recommended by coating manufacturer and according to SSPC-SP 10.
 - b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
 - c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire brush, solvent clean, and touch up with same primer as the shop coat.

- D. Material Preparation: Carefully mix and prepare coating materials according to manufacturer's written instructions.
1. Maintain containers used in mixing and applying coatings in a clean condition, free of foreign materials and residue.
 2. Stir materials before applying to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into the material. Remove film and, if necessary, strain coating material before using.
 3. Use only the type of thinners approved by manufacturer and only within recommended limits.
- E. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

- A. General: Apply high-performance coatings according to manufacturer's written instructions.
1. Use applicators and techniques best suited for the material being applied.
 2. Do not apply high-performance coatings over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to forming a durable coating film.
 3. Coating colors, surface treatments, and finishes are indicated in the coating system descriptions.
 4. Provide finish coats compatible with primers used.
- B. Scheduling Coating: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for coating as soon as practicable after preparation and before subsequent surface deterioration.
1. The number of coats and film thickness required is the same regardless of application method.
 - a. Omit primer on metal surfaces that have been shop primed and touchup painted.
 - b. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer.
 - c. Where manufacturer's written instructions require sanding, sand between applications to produce a smooth, even surface.

- d. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until coating has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat does not cause undercoat to lift or lose adhesion.
 2. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance. Give special attention to edges, corners, crevices, welds, exposed fasteners, and similar surfaces to ensure that they receive a dry film thickness equivalent to that of flat surfaces.
- C. Application Procedures: Apply coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brush Application: Use brushes best suited for material applied and of appropriate size for the surface or item being coated.
 - a. Apply primers and first coats by brush unless manufacturer's written instructions permit using roller or mechanical applicators.
 - b. Brush out and work brush coats into surfaces in an even film.
 - c. Eliminate cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Neatly draw glass lines and color breaks.
 2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by manufacturer for the material and texture required.
 3. Spray Equipment: Use mechanical methods to apply coating if permitted by manufacturer's written instructions and governing regulations.
 - a. Use spray equipment with orifice size recommended by manufacturer for material and texture required.
 - b. Apply each coat to provide the equivalent hiding of brush-applied coats.
 - c. Do not double back with spray equipment building-up film thickness of two coats in one pass, unless recommended by manufacturer.
- D. Minimum Coating Thickness: Apply each material no thinner than manufacturer's recommended spreading rate. Provide total dry film thickness of the entire system as recommended by manufacturer.
- E. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by manufacturer, to material required to be coated or finished that has not been prime coated by others.
1. Recoat primed and sealed substrates if there is evidence of suction spots or

- unsealed areas in first coat, to ensure a finish coat with no bum-through or other defects caused by insufficient sealing.
- F. Completed Work: Match approved Samples for color, texture, and coverage. Remove, refinish, or recoat work that does not comply with specified requirements.
- G. In the event that project schedule requires application of coatings when temperature or atmosphere requirements cannot be met, contractor shall tent, heat and protect surfaces to achieve proper application conditions.

3.4 FIELD QUALITY CONTROL

- A. Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when coatings are being applied:
1. Owner reserves the right to engage the services of a qualified testing agency to sample coating material being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
 2. Testing agency will perform appropriate tests for the following characteristics as required by Owner:
 - a. Quantitative materials analysis.
 - b. Absorption.
 - c. Accelerated weathering.
 - d. Accelerated yellowness.
 - e. Color retention.
 - f. Alkali and mildew resistance.
 - g. Abrasion resistance.
 - h. Apparent reflectivity.
 - i. Washability.
 - j. Dry opacity.
 - k. Recoating.
 - l. Skinning.
 3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with specified requirements. Contractor shall remove noncomplying coating materials from Project site, pay for testing, and recoat surfaces coated with rejected materials. If necessary, Contractor may be required to remove rejected materials from previously coated surfaces if, on recoating with specified materials, the two coatings are not compatible.

3.5 CLEANING

- A. Cleanup: At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
1. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage

adjacent finished surfaces.

3.6 PROTECTION

- A. Protect work of other trades, whether being coated or not, against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Owner, and leave in an undamaged condition.
 - 1. Provide "Wet Paint" signs to protect newly coated finishes. After completing coating operations, remove temporary protective wrappings provided by others to protect their work.
 - 2. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces. Comply with procedures specified in PDCA P1.

END OF SECTION 09960

SECTION 16005 – ELECTRICAL

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Riverwalk Lighting.

1.2 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. Federal Specifications (FS):
 - a. W-C-596, Connector, Electrical, Power, General Specification for.
2. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
 - a. C62.41, Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
 - b. PC62.41.1, Draft Guide on the Surge Environment in Low-Voltage (1000 V and less) AC Power Circuits.
3. International Electrical Testing Association (NETA): ATS, Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
4. National Electrical Contractor's Association, Inc. (NECA): 1, Standard Practices for Good Workmanship in Electrical Contracting.
5. National Electrical Manufacturers Association (NEMA):
 - a. C80.1, Rigid Steel Conduit-Zinc Coated.
 - b. 250, Enclosures for Electrical Equipment (1,000 Volts Maximum).
 - c. WC 70, Standard for Non-Shielded Power Cables Rated 2000 V or Less for the Distribution of Electrical Energy.
 - d. WD 1, General Color Requirements for Wiring Devices.
6. National Fire Protection Association (NFPA): 70, National Electrical Code (NEC).
7. Underwriters Laboratories, Inc. (UL):

- a. 1, Flexible Metal Conduit.
- b. 6, Electrical Rigid Metal Conduit—Steel.
- c. 44, Thermoset Insulated Wires and Cables.
- d. 360, Liquid-Tight Flexible Steel Conduit.
- e. 486A, Wire Connectors and Soldering Lugs for Use with Copper Conductors.
- f. 486C, Splicing Wire Connectors.
- g. 510, Polyvinyl Chloride, Polyethylene and Rubber Insulating Tape.
- h. 514B, Fittings for Cable and Conduit.

1.3 DEFINITIONS

- A. AHJ: Authority Having Jurisdiction.

1.4 SUBMITTALS

- A. Action Submittals:

1. Junction and pullboxes.
2. Support and framing channels.
3. Conduit, fittings, and accessories.
4. Conductors, cable, and accessories.
5. Grounding materials.
6. Luminaires.
7. Signed permits indicating Work is acceptable to regulatory authorities having jurisdiction.
8. Operation and Maintenance Data:
 - a. Provide for all equipment, as well as each device having features that can require adjustment, configuration, or maintenance.
 - b. Minimum information shall include manufacturer's preprinted instruction manual, one copy of the approved submittal information for the item, tabulation of any settings, and copies of any test reports.

1.5 APPROVAL BY AUTHORITY HAVING JURISDICTION

- A. Provide the Work in accordance with NFPA 70, National Electrical Code (NEC). Where required by the Authority Having Jurisdiction (AHJ), material and equipment shall be labeled or listed by a nationally recognized testing laboratory or other organization acceptable to the AHJ, in order to provide a basis for approval under the NEC.

- B. Materials and equipment manufactured within the scope of standards published by Underwriters Laboratories, Inc. shall conform to those standards and shall have an applied UL listing mark or label.

PART 2–PRODUCTS

2.1 GENERAL

- A. Products shall comply with all applicable provisions of NFPA 70.
- B. Like Items of Equipment: End products of one manufacturer in order to achieve standardization for appearance, operation, maintenance, spare parts, and manufacturer’s service.
- C. Equipment Finish:
 - 1. Manufacturer’s standard finish color, except where specific color is indicated.

2.2 JUNCTION AND PULL BOXES

- A. 14-gauge stainless steel, NEMA 4X

2.3 SUPPORT AND FRAMING CHANNELS

- A. Carbon Steel Framing Channel:
 - 1. Material: Rolled, mild strip steel, 12 gauge, ASTM A1011/A1011M, Grade 33.
 - 2. Finish: Hot-dip galvanized after fabrication.
- B. Stainless Steel Framing Channel: Rolled, ASTM A167, Type 316 stainless steel, 12 gauge.
- C. Manufacturers:
 - 1. B-Line Systems, Inc.
 - 2. Unistrut Corp.

2.4 CONDUIT AND FITTINGS

- A. PVC Coated Rigid Galvanized Steel Conduit:
 - 1. Meet requirements of NEMA C80.1 and UL 6.
 - 2. Material: Hot-dip galvanized, with chromated protective layer, and PVC coating.
- B. Flexible Metal, Liquid-Tight Conduit:
 - 1. UL 360 listed for 105 degrees C insulated conductors.
 - 2. Material: Galvanized steel, with an extruded PVC jacket.

C. Fittings:

1. Provide bushings, grounding bushings, conduit hubs, conduit bodies, couplings, unions, conduit sealing fittings, drain seals, drain/breather fittings, expansion fittings, and cable sealing fittings, as applicable.
2. Rigid Galvanized Steel and Intermediate Metal Conduit:
 - a. Meet requirements of UL 514B.
 - b. Type: Threaded, galvanized.
3. PVC Conduit:
 - a. Meet requirements of NEMA TC 3.
 - b. Type: PVC, slip-on.
4. Flexible Metal, Liquid-Tight Conduit:
 - a. Metal insulated throat connectors with integral nylon or plastic bushing rated for 105 degrees C.
 - b. Insulated throat and sealing O-rings.

2.5 CONDUCTORS AND CABLES

A. Conductors 600 Volts and Below:

1. Conform to applicable requirements of NEMA WC 71, WC 72, and WC 74.
2. Conductor Type:
 - a. 120- and 277-Volt Lighting, 10 AWG and Smaller: Stranded copper.
3. Insulation: Type XHHW-2.

B. Accessories:

1. Tape:
 - a. General Purpose, Flame Retardant: 7 mils, vinyl plastic, Scotch Brand 33, rated for 90 degrees C minimum, meeting requirements of UL 510.
 - b. Flame Retardant, Cold and Weather Resistant: 8.5 mils, vinyl plastic, Scotch Brand 88.
 - c. Arc and Fireproofing:
 - 1) 30 mils, elastomer.

- 2) Manufacturers and Products:
 - a) 3M; Scotch Brand 77, with Scotch Brand 69 glass cloth tapebinder.
 - b) Plymount; Plyarc 53, with Plyglas 77 glass cloth tapebinder.
2. Identification Devices:
 - a. Sleeve-type, permanent, PVC, yellow or white, with legible machine-printed black markings.
 - b. Manufacturer and Products: Raychem; Type D-SCE or ZH-SCE.
3. Connectors and Terminations:
 - a. Nylon, Self-Insulated Crimp Connectors:
 - 1) Manufacturers and Products:
 - a) Thomas & Betts; Sta-Kon.
 - b) Burndy; Insulug.
 - c) ILSCO.
 4. Self-Insulated, Freespring Wire Connector (Wire Nuts):
 - a. Plated steel, square wire springs.
 - b. UL Standard 486C.
 - c. Manufacturers and Products:
 - 1) Thomas & Betts.
 - 2) Ideal; Twister.
 5. Cable Ties:
 - a. Nylon, adjustable, self-locking, and reusable.
 - b. Manufacturer and Product: Thomas & Betts; TY-RAP.
 6. Heat Shrinkable Insulation:
 - a. Thermally stabilized, crosslinked polyolefin.
 - b. Manufacturer and Product: Thomas & Betts; SHRINK-KON.

2.6 GROUNDING

- A. Ground Rods: Provide copper-clad with minimum diameter of 5/8-inch, and length of 10 feet.
- B. Ground Conductors: As specified in Article Conductors and Cable.

C. Connectors:

1. Exothermic Weld Type:

- a. Outdoor Weld: Suitable for exposure to elements or direct burial.
- b. Indoor Weld: Utilize low-smoke, low-emission process.
- c. Manufacturers:
 - 1) Erico Products, Inc.; Cadweld and Cadweld Exolon.
 - 2) Thermoweld.

2. Compression Type:

- a. Compress-deforming type; wrought copper extrusion material.
- b. Single indentation for conductors 6 AWG and smaller.
- c. Double indentation with extended barrel for conductors 4 AWG and larger.
- d. Single barrels prefilled with oxide-inhibiting and antiseizing compound.
- e. Manufacturers:
 - 1) Burndy Corp.
 - 2) Thomas and Betts Co.
 - 3) ILSCO.

3. Mechanical Type:

- a. Split-bolt, saddle, or cone screw type; copper alloy material.
- b. Manufacturers:
 - 1) Burndy Corp.
 - 2) Thomas and Betts Co.

2.7 LUMINAIRES AND ACCESSORIES

- A. Type “A” light fixtures shall be the Bega Bollard 8659 LED with 13W LED lamp. Fixture shall be 120V and black in color. The light fixture shall include the anchor assembly kit.
- B. Type “B” light fixtures shall be the Phoenix VA-W-LED-13-NW-GHB-G. Fixture shall be wall mounted with a 13-watt LED lamp, be suitable for 120V and have a blue heat treated glass globe. Provide lamp.
- C. Photocell shall be the TORK phototimer plus 5737TZ, 120V. Photocell receptacle bracket shall be the TORK receptacle with plastic housing and mounting bracket, model 2421. Mount and aim the photocell switch according to manufacturer’s recommendations.

PART 3–EXECUTION

3.1 GENERAL

- A. Install materials and equipment in accordance with manufacturer's instructions and recommendations.
- B. Work shall comply with all applicable provisions of NECA 1.
- C. Install materials and equipment in hazardous areas in a manner acceptable to regulatory authority having jurisdiction for the class, division, and group of hazardous areas shown.
- D. Electrical Drawings show general locations of equipment, devices, and raceway, unless specifically dimensioned.

3.2 PROTECTION FOLLOWING INSTALLATION

- A. Protect materials and equipment from corrosion, physical damage, and effects of moisture on insulation.
- B. Cap conduit runs during construction with manufactured seals.
- C. Close openings in boxes or equipment during construction.
- D. Energize space heaters furnished with equipment.

3.3 JUNCTION AND PULL BOXES

- A. Install where shown and where necessary to terminate, tap-off, or redirect multiple conduit runs.
- B. Install pull boxes where necessary in raceway system to facilitate conductor installation.
- C. Install in conduit runs at least every 150 feet or after the equivalent of three right-angle bends.
- D. Use outlet boxes as junction and pull boxes wherever possible and allowed by applicable codes.
- E. Use conduit bodies as junction and pull boxes where no splices are required and their use is allowed by applicable codes.
- F. Installed boxes shall be accessible.
- G. Do not install on finished surfaces.
- H. Install plumb and level.
- I. Support boxes independently of conduit by attachment to building structure or structural member.

J. At or Below grade:

1. Install boxes for below grade conduit flush with finished grade in locations outside of paved areas, roadways, or walkways.
2. If adjacent structure is available, box may be mounted on structure surface just above finished grade in accessible but unobtrusive location.
3. Obtain Owner's written acceptance prior to installation in paved areas, roadways, or walkways.
4. Use boxes and covers suitable to support anticipated weights.

K. Flush Mounted:

1. Install with concealed conduit.
2. Holes in surrounding surface shall be no larger than required to receive box.
3. Make edges of boxes flush with final surface.

L. Mounting Hardware:

1. Noncorrosive Indoor Dry Areas: Galvanized.
2. Outdoor or Noncorrosive Indoor Wet Areas: Stainless steel.
3. Corrosive Areas: Stainless steel.

M. Location/Type:

1. Indoor, Dry: NEMA 250, Type 1.
2. Outdoor, Where Indicated Weatherproof (WP): NEMA 250, Type 3R.

3.4 SUPPORT AND FRAMING CHANNELS

A. Install where required for mounting and supporting electrical equipment and raceway systems.

B. Channel Type:

1. Interior, Wet or Dry Noncorrosive Locations: Carbon steel.
2. Interior, Wet or Dry Corrosive Locations: Type 316 stainless steel.
3. Outdoor, Corrosive Locations: Type 316 stainless steel.

C. Paint carbon steel channel cut ends prior to installation with zinc-rich primer.

3.5 CONDUIT AND FITTINGS

A. General:

1. Crushed or deformed raceways not permitted.

2. Maintain raceway entirely free of obstructions and moisture.
3. Immediately after installation, plug or cap raceway ends with watertight and dust-tight seals until time for pulling in conductors.
4. Sealing Fittings: Provide drain seal in vertical raceways where condensate may collect above sealing fitting.
5. Avoid moisture traps where possible. When unavoidable in exposed conduit runs, provide junction box and drain fitting at conduit low point.
6. Group raceways installed in same area.
7. Follow structural surface contours when installing exposed raceways. Avoid obstruction of passageways.
8. Run exposed raceways parallel or perpendicular to walls, structural members, or intersections of vertical planes.
9. Install watertight fittings in outdoor, underground, or wet locations.
10. Paint threads and cut ends, before assembly of fittings, galvanized conduit, PVC-coated galvanized conduit, or IMC installed in exposed or damp locations with zinc-rich paint or liquid galvanizing compound.
11. Metal conduit to be reamed, burrs removed, and cleaned before installation of conductors, wires, or cables.
12. Do not install raceways in concrete equipment pads, foundations, or beams.
13. Install concealed, embedded, and buried raceways so that they emerge at right angles to surface and have no curved portion exposed.

B. Conduit Application:

1. Diameter:
 - a. Interior Minimum: 3/4 inch.
 - b. Exterior Minimum: 3/4 inch.
2. Outdoor, Exposed:
 - a. PVC coated galvanized steel
3. Indoor, Exposed:
 - a. Rigid galvanized steel.

C. Connections: Outdoor areas:

1. Between Existing and proposed riverwalks: Flexible metal, liquid-tight conduit.
2. Junction boxes: 14-gauge stainless steel, NEMA 4X

D. Penetrations:

1. Make at right angles, unless otherwise shown.
2. Notching or penetration of structural members, including footings and beams, not permitted.
3. Entering Structures:
 - a. General: Seal raceway at the first box or outlet with oakum or expandable plastic compound to prevent the entrance of gases or liquids from one area to another.
 - b. Concrete Roof or Membrane Waterproofed Wall or Floor: Provide watertight seal.
 - c. Existing or Precast Wall (Underground): Core drill wall and install watertight entrance seal device.

E. Support:

1. Support from structural members only, at intervals not exceeding NFPA 70 requirements, and in any case not exceeding 10 feet. Do not support from piping, pipe supports, or other raceways.
2. Application/Type of Conduit Strap:
 - a. Steel Conduit: Zinc-coated steel, pregalvanized steel, or malleable iron.
 - b. Nonmetallic Conduit: Nonmetallic or PVC-coated metal.
3. Provide and attach wall brackets, strap hangers, or ceiling trapeze as follows:
 - a. Wood: Wood screws.
 - b. Hollow Masonry Units: Toggle bolts.
 - c. Concrete or Brick: Expansion shields, or threaded studs driven in by powder charge, with lock washers and nuts.
 - d. Steelwork: Machine screws.

e. Location/Type of Hardware:

- 1) Dry, Noncorrosive Areas: Galvanized.
- 2) Wet, Noncorrosive Areas: Stainless steel.

F. Bends:

1. Install concealed raceways with a minimum of bends in the shortest practical distance.
2. Install with symmetrical bends or cast metal fittings.
3. Avoid field-made bends and offsets, but where necessary, make with acceptable hickey or bending machine. Do not heat metal raceways to facilitate bending.
4. Make bends in parallel or banked runs from same center or centerline with same radius so that bends are parallel.
5. Factory elbows may be installed in parallel or banked raceways if there is change in plane of run and raceways are same size.
6. Flexible Conduit: Do not make bends that exceed allowable conductor bending radius of cable to be installed or that significantly restricts conduit flexibility.

G. Expansion and Deflection Fittings: Provide on all raceways at structural expansion joints and in long tangential runs.

H. Termination at Enclosures:

1. Cast Metal Enclosure: Provide manufacturer's premolded insulating sleeve inside metallic conduit terminating in threaded hubs.
2. Nonmetallic, Cabinets, and Enclosures: Terminate conduit in threaded conduit hubs, maintaining enclosure integrity.
3. Sheet Metal Boxes, Cabinets, and Enclosures:
 - a. Rigid Galvanized Conduit:
 - 1) Provide one lock nut each on inside and outside of enclosure.
 - 2) Install grounding bushing.
 - 3) Provide bonding jumper from grounding bushing to equipment ground bus or ground pad; if neither ground bus nor pad exists, connect jumper to lag bolt attached to metal enclosure.
 - 4) Install insulated bushing on ends of conduit where grounding is not

required.

- 5) Provide insulated throat when conduit terminates in sheet metal boxes having threaded hubs.
- 6) Utilize sealing locknuts or threaded hubs on outside of NEMA 3R and NEMA 12 enclosures.

3.6 CONDUCTORS AND CABLES

- A. Conductor storage, handling, and installation shall be in accordance with manufacturer's recommendations.
- B. Do not exceed manufacturer's recommendations for maximum pulling tensions and minimum bending radii.
- C. Conduit system shall be complete prior to drawing conductors. Lubricate prior to pulling into conduit. Lubrication type shall be as approved by conductor manufacturer.
- D. Terminate all conductors and cables, unless otherwise shown.
- E. Do not splice conductors, unless specifically indicated or approved by Engineer.
- F. Bundling: Where single conductors and cables in manholes, handholes, vaults, cable trays, and other indicated locations are not wrapped together by some other means, bundle conductors from each conduit throughout their exposed length with cable ties placed at intervals not exceeding 12 inches.
- G. Wiring within Equipment and Local Control Panels: Remove surplus wire, dress, bundle, and secure.
- H. Power Conductor Color Coding:
 1. 6 AWG and Larger: Apply general purpose, flame retardant tape at each end, and at accessible locations wrapped at least six full overlapping turns, covering an area 1-1/2 to 2 inches wide.
 2. 8 AWG and Smaller: Provide colored conductors.
 3. Colors:
 - a. Neutral Wire: White.
 - b. Live Wires, 120/240-Volt, Single-Phase System: Black, red.
 - c. Live Wires, 120/208-Volt, Three-Phase System: Black, red, or blue.

- d. Live Wires, 277/480-Volt, Three-Phase System: Brown, orange, or yellow.
 - e. Ground Wire: Green.
- I. Circuit Identification:
1. Circuits Appearing in Circuit Schedules: Identify power, instrumentation, and control conductor circuits, using circuit schedule designations, at each termination and in accessible locations such as manholes, handholes, panels, switchboards, motor control centers, pull boxes, and terminal boxes.
 2. Circuits Not Appearing in Circuit Schedules: Assign circuit name based on device or equipment at load end of circuit. Where this would result in same name being assigned to more than one circuit, add number or letter to each otherwise identical circuit name to make it unique.
 3. Method: Identify with sleeves. Taped-on markers or tags relying on adhesives not permitted.
- J. Connections and Terminations:
1. Install wire nuts only on solid conductors.
 2. Tape insulate all uninsulated connections.
 3. Install crimp connectors and compression lugs with tools approved by connector manufacturer.

3.7 GROUNDING

- A. Grounding shall be in compliance with NFPA 70 and as shown.
- B. Bond together exposed noncurrent-carrying metal parts of electrical equipment, metal raceways, ground conductor in raceways and cables, receptacle ground connections, and metal piping systems.
- C. Equipment Grounding Conductors: Provide in all conduits containing power conductors and control circuits above 50 volts.
- D. Ground Rods: Install full length with conductor connection at upper end.

3.8 LUMINAIRES AND ACCESSORIES

- A. Install in accordance with manufacturer's recommendations.
- B. Install plumb and level at mounting heights shown.

3.9 LIGHTING CONTROL

- A. Outdoor Luminaires: Photocells shall switch lights ON at dusk and OFF at dawn.

END OF SECTION 16005