BID OF _____

2013

PROPOSAL, CONTRACT, BOND AND SPECIFICATIONS

FOR

BREESE STEVENS FIELD LIGHTING/SOUND SYSTEM IMPROVEMENTS

CONTRACT NO. 7044

IN

MADISON, DANE COUNTY, WISCONSIN

AWARDED BY THE COMMON COUNCIL
MADISON, WISCONSIN ON _____

CITY ENGINEERING DIVISION
1600 EMIL STREET
MADISON, WISCONSIN 53713

www.cityofmadison.com/business/pw

https://bidexpress.com/login

BREESE STEVENS FIELD LIGHTING/SOUND SYSTEM IMPROVEMENTS
CONTRACT NO. 7044

INDEX

This Proposal, and Agreement have
been prepared by:

CITY PARKS DIVISION
CITY OF MADISON
MADISON, DANE COUNTY, WISCONSIN

Kevin Briski – Superintendant of Parks

SECTION A: ADVERTISEMENT FOR BIDS AND INSTRUCTIONS TO BIDDERS

REQUEST FOR BID FOR PUBLIC WORKS CONSTRUCTION
CITY OF MADISON, WISCONSIN

A BEST VALUE CONTRACTING MUNICIPALITY

PROJECT NAME:	BREESE STEVENS FIELD LIGHTING/SOUND SYSTEM IMPROVEMENTS
CONTRACT NO.:	7044
SBE GOAL	10%
BID BOND	5%
PRE BID MEETING (1:00 P.M.)	5/31/13
PREQUALIFICATION APPLICATION DUE (1:00 P.M)	5/31/13
BID SUBMISSION (1:00 P.M.)	6/07/13
BID OPEN (1:30 P.M.)	6/07/13
PUBLISHED IN WSJ	5/17/13 & 5/24/13 & 5/31/13

PRE BID MEETING: Representatives of the Affirmative Action Department will be present to discuss the Small Business Enterprise requirements at 1600 Emil Street, Madison Wisconsin.

PREQUALIFICATION APPLICATION: Forms are available on our website, www.cityofmadison.com/business/pw/forms.cfm. If not currently prequalified in the categories listed in Section A, an amendment to your Prequalification will need to be submitted prior to the same due date. Postmark is not applicable.

BIDS TO BE SUBMITTED by hand to 1600 EMIL ST., MADISON, WI 53713 or online at www.bidexpress.com.

THE BID OPENING is at 1600 EMIL ST., MADISON, WI 53713.

Plans and Specifications are also available at 1600 Emil St., Madison, WI, 53713; (608) 267-1197.

STANDARD SPECIFICATIONS

The City of Madison's Standard Specifications for Public Works Construction - 2013 Edition, as supplemented and amended from time to time, forms a part of these contract documents as if attached hereto.

These standard specifications are available on the City of Madison Public Works website, www.cityofmadison.com/Business/PW/specs.cfm.

The Contractor shall review these Specifications prior to preparation of proposals for the work to be done under this contract, with specific attention to Article 102, "BIDDING REQUIREMENTS AND CONDITIONS" and Article 103, "AWARD AND EXECUTION OF THE CONTRACT." For the convenience of the bidder, below are highlights of three subsections of the specifications.

SECTION 102.1: PRE-QUALIFICATION OF BIDDERS

In accordance with Wisconsin State Statutes 66.0901 (2) and (3), all bidders must submit to the Board of Public Works proof of responsibility on forms furnished by the City. The City requires that all bidders be qualified on a biennial basis.

Bidders must present satisfactory evidence that they have been regularly engaged in the type of work specified herein and they are fully prepared with necessary capital, materials, machinery and supervisory personnel to conduct the work to be contracted for to the satisfaction of the City. All bidders must be pre-qualified by the Board of Public Works for the type of construction on which they are bidding prior to the opening of the bid.

In accordance with Section 39.02(9)(a)l. of the General Ordinances, all bidders shall submit in writing to the Affirmative Action Division Manager of the City of Madison, a Certificate of Compliance or an Affirmative Action Plan at the same time or prior to the submission of the proof of responsibility forms.

The bidder shall be disqualified if the bidder fails to or refuses to, prior to opening of the bid, submit a Certificate of compliance, Affirmative Action Plan or Affirmative Action Data Update, as applicable, as defined by Section 39.02 of the General Ordinances (entitled Affirmative Action) and as required by Section 102.11 of the Standard Specifications.

SECTION 102.4 PROPOSAL

No bid will be accepted that does not contain an adequate or reasonable price for each and every item named in the Schedule of Unit Prices.

A lump sum bid for the work in accordance with the plans and specifications is required. The lump sum bid must be the same as the total amounts bid for the various items and it shall be inserted in the space provided.

All papers bound with or attached to the proposal form are considered a part thereof and must not be detached or altered when the proposal is submitted. The plans, specifications and other documents designated in the proposal form will be considered a part of the proposal whether attached or not.

A proposal submitted by an individual shall be signed by the bidder or by a duly authorized agent. A proposal submitted by a partnership shall be signed by a member/partner or by a duly authorized agent thereof. A proposal submitted by a corporation shall be signed by an authorized officer or duly authorized registered agent of such corporation, and the proposal shall show the name of the State under the laws of which such corporation was chartered. The required signatures shall in all cases appear in the space provided thereof on the proposal.

Each proposal shall be placed, together with the proposal guaranty, in a sealed envelope, so marked as to indicate name of project, the contract number or option to which it applies, and the name and address of the Contractor or submitted electronically through Bid Express (www.bidexpress.com). Proposals will be accepted at the location, the time and the date designated in the advertisement. Proposals received after the time and date designated will be returned to the bidder unopened.

The Bidder shall execute the Disclosure of Ownership form. REFER TO SECTION F.

SECTION 102.5: BID DEPOSIT (PROPOSAL GUARANTY)

All bids, sealed or electronic, must be accompanied with a Bid Bond equal to at least 5% of the bid or a Certificate of Annual/Biennial Bid Bond or certified check, payable to the City Treasurer. Bid deposit of the successful bidders shall be returned within forty-eight (48) hours following execution of the contract and bond as required.

PREVAILING WAGE RATES

Prevailing Wage Rates may be required and are attached in Section J of the contract. See Special Provisions to determine applicability.

Bidders for this Contract(s) must be Pre-Qualified for at least one of the following type(s) of construction denoted by an ☒

Building Demolition

101 ☐ Asbestos Removal
120 ☐ House Mover
110 ☐ Building Demolition

Street, Utility and Site Construction

201 ☐ Asphalt Paving
205 ☐ Blasting
210 ☐ Boring/Pipe Jacking
215 ☐ Concrete Paving
220 ☐ Con. Sidewalk/Curb & Gutter/Misc. Flat Work
221 ☒ Concrete Bases and Other Concrete Work
225 ☐ Dredging
230 ☐ Fencing
235 ☒ Fiber Optic Cable/Conduit Installation
240 ☐ Grading and Earthwork
241 ☐ Horizontal Saw Cutting of Sidewalk
242 ☐ Infrared Seamless Patching
245 ☐ Landscaping, Maintenance
250 ☐ Landscaping, Site and Street
251 ☐ Parking Ramp Maintenance
255 ☐ Pavement Sealcoating and Crack Sealing
260 ☐ Petroleum Above/Below Ground Storank Tank Removal/Install
265 ☐ Retaining Walls, Precast Modular Units
270 ☐ Retaining Walls, Reinforced Concrete
275 ☐ Sanitary, Storm Sewer and Water Main Construction
280 ☐ Sewer Lateral Drain Cleaning/Internal TV Insp.
285 ☐ Sewer Lining
290 ☐ Sewer Pipe Bursting
295 ☐ Soil Borings
300 ☐ Soil Nailing
305 ☐ Storm & Sanitary Sewer Laterals & Water Svc.
310 ☐ Street Construction
315 ☒ Street Lighting
318 ☐ Tennis Court Resurfacing
320 ☐ Traffic Signals
325 ☐ Traffic Signing & Marking
332 ☐ Tree pruning/removal
333 ☐ Tree, pesticide treatment of
335 ☐ Trucking
340 ☐ Utility Transmission Lines including Natural Gas, Electrical & Communications
399 ☐ Other_____

Bridge Construction

501 ☐ Bridge Construction and/or Repair

Building Construction

401 ☐ Floor Covering (including carpet, ceramic tile installation, rubber, VCT
402 ☐ Building Automation Systems
403 ☐ Concrete
404 ☐ Doors and Windows
405 ☒ Electrical - Power, Lighting & Communications
410 ☐ Elevator - Lifts
412 ☐ Fire Suppression
413 ☐ Furnishings - Furniture and Window Treatments
415 ☐ General Building Construction, Equal or Less than $250,000
420 ☐ General Building Construction, $250,000 to $1,500,000
425 ☐ General Building Construction, Over $1,500,000
428 ☐ Glass and/or Glazing
429 ☐ Hazardous Material Removal
430 ☐ Heating, Ventilating and Air Conditioning (HVAC)
433 ☐ Insulation - Thermal
435 ☐ Masonry/Tuck pointing
437 ☐ Metals
440 ☐ Painting and Wallcovering
445 ☐ Plumbing
450 ☐ Pump Repair
455 ☐ Pump Systems
460 ☐ Roofing and Moisture Protection
461 ☐ Solar Photovoltaic/Hot Water Systems
465 ☐ Soil/Groundwater Remediation
466 ☐ Warning Sirens
470 ☐ Water Supply Elevated Tanks
475 ☐ Water Supply Wells
480 ☐ Wood, Plastics & Composites - Structural & Architectural
499 ☐ Other_____

State of Wisconsin Certifications

1 ☐ Class 5 Blaster - Blasting Operations and Activities 2500 feet and closer to inhabited buildings for quarries, open pits and road cuts.
2 ☐ Class 6 Blaster - Blasting Operations and Activities 2500 feet and closer to inhabited buildings for trenches, site excavations, basements, underwater demolition, underground excavations, or structures 15 feet or less in height.
3 ☐ Class 7 Blaster - Blasting Operations and Activities for structures greater than 15 ' in height, bridges, towers, and any of the objects or purposes listed as “Class 5 Blaster or Class 6 Blaster”.
4 ☐ Petroleum Above/Below Ground Storage Tank Removal and Installation (Attach copies of State Certifications.)
5 ☐ Hazardous Material Removal (Contractor to be certified for asbestos and lead abatement per the Wisconsin Department of Health Services, Asbestos and Lead Section (A&LS).) See the following link for application: www.dhs.wisconsin.gov/Asbestos/Cert. State of Wisconsin Performance of Asbestos Abatement Certificate must be attached.
6 ☐ Certification number as a Certified Arborist or Certified Tree Worker as administered by the International Society of Arboriculture
7 ☐ Pesticide application (Certification for Commercial Applicator For Hire with the certification in the category of turf and landscape (3.0) and possess a current license issued by the DATCP)
8 ☐ Other_____
9 ☐ Other_____

SECTION B: PROPOSAL

Please refer to the Bid Express Website at https://bidexpress.com look up contract number and go to Section B: Proposal Page

You can access all City of Madison bid solicitations for FREE at www.bidexpress.com

Click on the "Register for Free" button and follow the instructions to register your company and yourself. You will be asked for a payment subscription preference, since you may wish to bid online someday. Simply choose the method to pay on a 'per bid' basis. This requires no payment until / unless you actually bid online. You can also choose the monthly subscription plan at this time. You will, however, be asked to provide payment information. Remember, you can change your preference at anytime. You will then be able to complete your free registration and have full access to the site. Your free access does not require completion of the 'Digital ID' process, so you will have instant access for viewing and downloading. To be prepared in case you ever do wish to bid online, you may wish to establish your digital ID also, since you cannot bid without a Digital ID.

If you have any problems with the free registration process, you can call the bidexpress help team, toll free at 1-888-352-2439 (option 1, option1).

SECTION C: SMALL BUSINESS ENTERPRISE

Instructions to Bidders
City of Madison
SBE Program Information

2 Small Business Enterprise (SBE) Program Information

2.1 Policy and Goal

The City of Madison reaffirms its policy of nondiscrimination in the conduct of City business by maintaining a procurement process which remains open to all who have the potential and ability to sell goods and services to the City. It is the policy of the City of Madison to allow Small Business Enterprises (SBE) maximum feasible opportunity to participate in City of Madison contracting. The bidder acknowledges that its bid has been submitted in accordance with the SBE program and is for the public's protection and welfare.

Please refer to the "ADVERTISEMENT FOR BIDS" for the goal for the utilization of SBEs on this project. SBEs may participate as subcontractors, vendors and/or suppliers, which provide a commercially useful function. The dollar value for SBE suppliers or 'materials only' vendors shall be discounted to 60% for purposes of meeting SBE goals.

A bidder which achieves or exceeds the SBE goal will be in compliance with the SBE requirements of this project. In the event that the bidder is unable to achieve the SBE goal, the bidder must demonstrate that a good faith effort to do so was made. Failure to either achieve the goal or demonstrate a good faith effort to do so will be grounds for the bidder being deemed a non-responsible contractor ineligible for award of this contract.

A bidder may count towards its attainment of the SBE goal only those expenditures to SBEs that perform a commercially useful function. For purposes of evaluating a bidder's responsiveness to the attainment of the SBE goal, the contract participation by an SBE is based on the percentage of the total base bid proposed by the Contractor. The total base bid price is inclusive of all addenda.

Work performed by an SBE firm in a particular transaction can be counted toward the goal only if it involves a commercially useful function. That is, in light of industry practices and other relevant considerations, does the SBE firm have a necessary and useful role in the transaction, of a kind for which there is a market outside the context of the SBE Program, or is the firm's role a superfluous step added in an attempt to obtain credit towards goals? If, in the judgment of the Affirmative Action Division, the SBE firm will not perform a commercially useful function in the transaction, no credit towards goals will be awarded.

The question of whether a firm is performing a commercially useful function is completely separate from the question of whether the firm is an eligible SBE. A firm is eligible if it meets the definitional criteria and ownership and control requirements, as set forth in the City of Madison's SBE Program.

If the City of Madison determines that the SBE firm is performing a commercially useful function, then the City of Madison must then decide what that function is. If the commercially useful function is that of an SBE vendor / supplier that regularly transacts business with the respective product, then the City of Madison will count 60% of the value of the product supplied toward SBE goals.

To be counted, the SBE vendor / supplier must be engaged in selling the product in question to the public. This is important in distinguishing an SBE vendor / supplier, which has a regular trade with a variety of customers, from a firm which performs supplier-like functions on an ad hoc basis or for only one or two contractors with whom it has a special relationship.

A supplier of bulk goods may qualify as an eligible SBE vendor / supplier if it either maintains an inventory or owns or operates distribution equipment. With respect to the distribution equipment; e.g., a fleet of trucks, the term "operates" is intended to cover a situation in which the supplier leases the equipment on a regular basis for its entire business. It is not intended to cover a situation in which the firm simply provides drivers for trucks owned or leased by another party; e.g., a prime contractor, or leases such a party's trucks on an ad hoc basis for a specific job.

If the commercially useful function being performed is not that of a qualified SBE vendor / supplier, but rather that of delivery of products, obtaining bonding or insurance, procurement of personnel, acting as a broker or manufacturer's representative in the procurement of supplies, facilities, or materials, etc., only the fees or commissions will apply towards the goal.

For example, a business that simply transfers title of a product from manufacturer to ultimate purchaser; e. g., a sales representative who re-invoices a steel product from the steel company to the Contractor, or a firm that puts a product into a container for delivery would not be considered a qualified SBE vendor / supplier. The Contractor would not receive credit based on a percentage of the cost of the product for working with such firms.

Concerning the use of services that help the Contractor obtain needed supplies, personnel, materials or equipment to perform a contract: only the fee received by the service provider will be counted toward the goal. For example, use of a SBE sales representative or distributor for a steel company, if performing a commercially useful function at all, would entitle the Contractor receiving the steel to count only the fee paid to the representative or distributor toward the goal. This provision would also govern fees for professional and other services obtained expressly and solely to perform work relating to a specific contract.

Concerning transportation or delivery services: if an SBE trucking company picks up a product from a manufacturer or a qualified vendor / supplier and delivers the product to the Contractor, the commercially useful function it is performing is not that of a supplier, but simply that of a transporter of goods. Unless the trucking company is itself the manufacturer or a qualified vendor / supplier in the product, credit cannot be given based on a percentage of the cost of the product. Rather, credit would be allowed for the cost of the transportation service.

The City is aware that the rule's language does not explicitly mention every kind of business that may contribute work on this project. In administering these programs, the City would, on a case-by-case basis, determine the appropriate counting formula to apply in a particular situation.

2.2 Contract Compliance

Questions concerning the SBE Program shall be directed to the Contract Compliance Officer of the City of Madison Department of Civil Rights, Affirmative Action Division, 210 Martin Luther King, Jr. Blvd., Room 523, Madison, WI 53703; telephone (608) 266-4910.

2.3 Certification of SBE by City of Madison

The Affirmative Action Division maintains a directory of SBEs which are currently certified as such by the City of Madison. Contact the Contract Compliance Officer as indicated in Section 2.2 to receive a copy of the SBE Directory or you may access the SBE Directory online at www.cityofmadison.com/dcr/aaTBDir.cfm.

All contractors, subcontractors, vendors and suppliers seeking SBE status must complete and submit the **Targeted Business Certification Application** to the City of Madison Affirmative Action Division by the time and date established for receipt of bids. A copy of the Targeted Business Certification Application is available by contacting the Contract Compliance Officer at the address and telephone indicated in Section 2.2 or you may access the Targeted Business Certification Application online at www.cityofmadison.com/dcr/aaTBDir.cfm. Submittal of the Targeted Business Certification Application by the time specified does not guarantee that the applicant will be certified as a SBE eligible to be utilized towards meeting the SBE goal for this project.

2.4 Small Business Enterprise Compliance Report

2.4.1 Good Faith Efforts

Bidders shall take all necessary affirmative steps to assure that SBEs are utilized when possible and that the established SBE goal for this project is achieved. A contractor who self performs a portion of the work, and is pre-qualified to perform that category of work, may subcontract that portion of the work, but shall not be required to do so. When a bidder is unable to achieve the established SBE goal, the bidder must demonstrate that a good faith effort to do so was made. Such a good faith effort should include the following:

2.4.1.1 Attendance at the pre-bid meeting.

2.4.1.2 Using the City of Madison's directory of certified SBEs to identify SBEs from which to solicit bids.

2.4.1.3 Assuring that SBEs are solicited whenever they are potential sources.

2.4.1.4 Referring prospective SBEs to the City of Madison Affirmative Action Division for certification.

2.4.1.5 Dividing total project requirements into smaller tasks and/or quantities, where economically feasible, to permit maximum feasible SBE participation.

2.4.1.6 Establishing delivery schedules, where requirements permit, which will encourage participation by SBEs.

2.4.1.7 Providing SBEs with specific information regarding the work to be performed.

2.4.1.8 Contacting SBEs in advance of the deadline to allow such businesses sufficient time to prepare a bid.

2.4.1.9 Utilizing the bid of a qualified and competent SBE when the bid of such a business is deemed reasonable (i.e. 5% above the lowest bidder), although not necessarily low.

2.4.1.10 Contacting SBEs which submit a bid, to inquire about the details of the bid and confirm that the scope of the work was interpreted as intended.

2.4.2 Reporting SBE Utilization and Good Faith Efforts

The Small Business Enterprise Compliance Report is to be submitted by the bidder with the bid: This report is due by the specified bid closing time and date. Bids submitted without a completed SBE Compliance Report as outlined below

shall be deemed non-responsible and the bidder ineligible for award of this contract.

2.4.2.1 If the Bidder meets or exceeds the goal established for SBE utilization, the Small Business Enterprise Compliance Report shall consist of the following:

2.4.2.1.1 **Cover Page,** Page C-7; and
2.4.2.1.2 **Summary Sheet,** C-8.

2.4.2.2 If the bidder does not meet the goal established for SBE utilization, the Small Business Enterprise Compliance Report shall consist of the following:

2.4.2.2.1 **Cover Page,** Page C-7;
2.4.2.2.2 **Summary Sheet,** C-8; and
2.4.2.2.3 **SBE Contact Report,** C-9 and C-10. (A separate Contact Report must be completed for each applicable SBE which is not utilized.)

2.5 Appeal Procedure

A bidder which does not achieve the established goal and is deemed non-responsible for failure to demonstrate a good faith effort to achieve such goal and subsequently denied eligibility for award of contract may, within 72 hours of receiving such notification, appeal that decision to a special appeals committee composed of three (3) members of the Affirmative Action Commission, three (3) members of the Board of Public Works and a seventh member appointed by the Mayor. All appeals must be made in writing to the City Engineer and received within 72 hours of City of Madison's notice. Postmark not applicable.

2.6 SBE Requirements After Award of the Contract

The successful bidder shall identify SBE subcontractors, suppliers and vendors on the subcontractor list in accordance with the specifications. The Contractor shall submit a detailed explanation of any variances between the listing of SBE subcontractors, vendors and/or suppliers on the subcontractor list and the Contractor's SBE Compliance Report for SBE participation.

No change in SBE subcontractors, vendors and/or suppliers from those SBEs indicated in the SBE Compliance Report will be allowed without prior approval from the Engineer and the Affirmative Action Division. The contractor shall submit in writing to the City of Madison Affirmative Action Division a request to change any SBE citing specific reasons which necessitate such a change. The Affirmative Action Division will use a general test of reasonableness in approving or rejecting the contractor's request for change. If the request is approved, the Contractor will make every effort to utilize another SBE if available.

The City will monitor the project to ensure that the actual percentage commitment to SBE firms is carried out.

2.7 SBE Definition and Eligibility Guidelines

A Small Business Enterprise is a business concern awarded certification by the City of Madison. For the purposes of this program a Small Business Enterprise is defined as:

A. An independent business operated under a single management. The business may not be a subsidiary of any other business and the stock or ownership may not be held by any individual or any business operating in the same or a similar field. In determining whether an entity qualifies as a SBE, the City shall consider all factors relevant to being an independent business including, but not limited to, the date the business was established, adequacy of its resources for the work in which it proposes to involve itself, the degree to which financial, equipment leasing and other relationships exist with other ineligible firms in the same or similar lines of work. SBE owner(s) shall enjoy the customary incidents of ownership and shall share in the risks and profits commensurate with their enjoyment interests, as demonstrated by an examination of the substance rather than form or arrangements that may be reflected in its ownership documents.

B. A business that has averaged no more than $4.0 million in annual gross receipts over the prior three year period and the principal owner(s) do not have a personal net worth in excess of $1.32 million.

Firm and/or individuals that submit fraudulent documents/testimony may be barred from doing business with the City and/or forfeit existing contracts.

SBE certification is valid for one (1) year unless revoked.

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Small Business Enterprise Compliance Report

This information may be submitted electronically through Bid Express or submitted with bid in sealed envelope.

Cover Sheet

Prime Bidder Information

Company: _____

Address: _____

Telephone Number: _____ Fax Number: _____

Contact Person/Title: _____

Prime Bidder Certification

I, _____ (Name), _____ (Title) of

_____ (Company) certify that the information

contained in this SBE Compliance Report is true and correct to the best of my knowledge and belief.

_____ _____

Witness' Signature Bidder's Signature

_____

Date

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Small Business Enterprise Compliance Report

Summary Sheet

SBE Subcontractors Who Are NOT Suppliers

Name(s) of SBEs Utilized	Type of Work	% of Total Bid Amount
		%
		%
		%
		%
		%
		%
		%
		%
		%
		%
		%
		%
		%

Subtotal SBE who are NOT suppliers: _____ %

SBE Subcontractors Who Are Suppliers

Name(s) of SBEs Utilized	Type of Work	% of Total Bid Amount
		%
		%
		%
		%
		%
		%

Subtotal Contractors who are suppliers: _____ % x 0.6 = _____ % (discounted to 60%)

Total Percentage of SBE Utilization: _____%.

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Small Business Enterprise Compliance Report

SBE Contact Report

Submit separate copy of this form for each SBE which you are not able to utilize towards meeting the SBE goal for this project. Attach separate sheets if necessary.

SBE Information

Company: _____

Address: _____

Telephone Number: _____

Contact Person/Title: _____

1. Outline below all efforts to solicit a bid from the above SBE. Include date, means of contact, who from your company made this contact and the result.

   _____

   _____

   _____

2. Describe the information provided to the aforementioned SBE regarding the scope of work for which he/she was to provide a bid.

   _____

   _____

   _____

   Is this the same scope of work on which the subcontractor you intend to utilize based his/her bid?

   ☐ Yes ☐ No

3. Did this SBE submit a bid? ☐ Yes ☐ No

4. Is the General Contractor pre-qualified to self-perform this category of work?

   ☐ Yes ☐ No

5. If you responded “Yes” to Question 3, please check the items below which apply and provide the requested detail. If you responded “No” to Question 3, please skip ahead to item 6 below.

☐ The SBE listed above is unavailable for work on this project for the following reasons. Provide specific detail for this conclusion.

_____

_____

☐ The SBE listed above is unqualified for work on this project. Provide specific details for this conclusion.

_____

_____

☐ The SBE listed above provided a price that was unreasonable (i.e. more than 5% above the lowest bidder). Provide specific detail for this conclusion including the SBE’s price and the price of the subcontractor you intend to utilize.

_____

_____

☐ A contract with the SBE listed above may constitute a breach of the bidder’s collective bargaining agreements. Provide specific detail for this conclusion including, but not limited to, correspondence from the SBE indicating it will not sign a project labor agreement and/or correspondence from the applicable trade union indicating a project labor agreement will not be allowed at the time of project bidding.

_____

_____

☐ Other; please specify reason(s) other than listed above which made it impossible for you to utilize this SBE on this project.

_____

_____

6. Describe any other good faith efforts:

_____

_____

SECTION D: SPECIAL PROVISIONS

BREESE STEVENS FIELD LIGHTING/SOUND SYSTEM IMPROVEMENTS
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It is the intent of these Special Provisions to set forth the final contractual intent as to the matter involved and shall prevail over the Standard Specifications and plans whenever in conflict therewith. In order that comparisons between the Special Provisions can be readily made, the numbering system for the Special Provisions is equivalent to that of the Specifications.

Whenever in these Specifications the term "Standard Specifications" or "General Conditions" appears, it shall be taken to refer to the City of Madison Standard Specifications for Public Works Construction and Supplements thereto.

SECTION 102.10: MINIMUM RATE OF WAGE SCALE

For this project, payment of prevailing wages (white sheet) is not required if either: a single trade accounts for 85% or more of the total labor costs of the project and the bid is less than $48,000; or no single trade accounts for 85% or more of the total labor costs of the project and the bid is less than $100,000. For bids not meeting either of these conditions, prevailing wages shall be required.

If required, the wages and benefits paid on the contract shall not be less than those specified in the Prevailing Wage Determination included with these contract documents for the following types of work:

☒ Building and Heavy Construction
☐ Sewer, Water, and Tunnel Construction
☐ Local Street and Miscellaneous Paving Operations
☐ Residential and Agricultural Construction

All bidders are notified that all labor employed on City contracts must be paid in accordance with the minimum rate of wage scale included in the Contract Documents.

For the information of the employees working on the project, a copy of the wage scale included in the contract documents and the provisions of Section 66.0903(8) of the Wisconsin Statutes shall be kept posted by the employer and in at least one conspicuous and easily accessible place at the site of the project.

The Contractor shall keep weekly payroll records setting forth the name, address, telephone number, classification, wage rate and fringe benefit package of each employee who worked on such City project and all other projects the employee worked in the same period, and the Contractor must keep records of the individual time each employee worked on the project and for each day of the project. Records shall include employee demographics or contractor can submit a one-time report of all employee demographics that can be matched up with weekly payrolls. Reports shall only include last four social security digits. Such records shall also set forth the total number of hours of overtime credited to each such employee for each day and week and the amount of overtime pay received in that week. Such records shall, in addition, set forth the full weekly wages earned by each such employee and the actual hourly wage paid to that employee. The Contractor shall submit payroll records to the Engineer every week for those periods when work is being done on the project. Said submittal shall be within twenty-one (21) calendar days of the end of the Contractor's weekly pay period.

The Contractor shall ensure that employees shall be paid unconditionally and shall receive the full amounts accrued at the time of payment, computed at rates not less than those stated in the City of Madison "Minimum Rate of Wage Scale" and that each employee's rate shall be determined by the work that is done within the trade or occupation classification which should be properly assigned to such employee. Questions regarding an employee's classification or rate of pay within that classification, shall be resolved by the practice that predominates in the industry and on which the trade or occupation rate/classification is based. Therefore, rate of pay, classification and work jurisdiction disputes shall be

resolved by relying upon practices established by collective bargaining agreements and guidelines used in such determinations by appropriate recognized trade unions operating within the City of Madison.

The Contractor shall agree that the normal rate of wage paid to the Contractor's employees on other projects shall not be reduced or otherwise diminished as a result of the requirement to pay no less than the minimum rate of wage scale on a City project. Mulcting of employees on City projects by contractors, such as by kickbacks or other such devices, is prohibited.

These contract provisions shall apply to all work performed on the contract by the Contractor with its own organization and with assistance of laborers under its immediate superintendency and to all work performed by piecework or by subcontract. No laborer, worker, or mechanic shall be employed directly upon the site of the work except on a wage basis, but this shall not be construed to prohibit the rental of equipment from individuals.

In the event of a refusal by the Contractor to submit payroll records as required by the contract, the City of Madison shall have the option to cancel this contract and request the Surety to perform or to re-let the balance of the work for bids, and in that event, to charge the Contractor for any loss which the City may incur thereby.

SECTION 102.12: BEST VALUE CONTRACTING

This Contract shall be considered a Best Value Contract if the Contractor's bid is equal to or greater than $53,000 for a single trade contract; or equal to or greater than $257,500 for a multi-trade contract pursuant to MGO 33.07(7).

SECTION 104 SCOPE OF WORK

The project consists of providing all work, equipment, and materials required to remove an existing sports lighting system and provide new sports lighting and sound systems at the Breese Stevens Athletic Field in accordance with the contract documents. **The following is a brief summary of the work required and is not intended to be all inclusive. Refer to the contract documents for all work required as part of this contract:**

- Remove the existing sports lighting system and three 80-foot tall truss-tower lighting structures.
- Provide new sports lighting assemblies on five existing 80-foot tall galvanized steel poles and provide three new 80-foot tall galvanized steel poles with sports lighting assemblies mounted on the existing truss-tower bases. Provide/install new adapter baseplates on the three existing truss-tower bases to accommodate the new galvanized steel poles.
- Reconfigure the existing lighting system distribution panel feeder and provide new circuit breakers for new conduit and wiring from the existing distribution panel to the new lighting system equipment.
- Directional-drill new conduits below the existing soccer field playing surface and provide handholes for new lighting system branch circuits to fixtures on the south side of the field.
- Install new sound system equipment racks and remote interface devices in the existing press box and fire suppression piping room, as well as six loudspeakers mounted on three of the existing 80-foot tall lighting system poles located at the stadium seating area on the north side of the field. The sound system includes below-grade wired communications between the two sound system equipment racks, as well as wired and wireless microphone systems at the press box.
- Test and adjust the lighting and sound systems to meet the requirements of the equipment manufacturers and the contract documents.
- Restore all disturbed surfaces to match existing.

- Construction shall be staged and coordinated such that either the existing or new lighting systems are available for use during all scheduled activities for the entire construction period.

The Contractor shall visit the site prior to bidding to become familiar with the existing conditions. **Breese Stevens Field will be open for contractors to tour the facility on Friday, May 31, from 2:00 PM to 3:00 PM.** This work and any other work required to complete the contract according to these plans and specifications are to be included in the amount listed in the proposal page as "base bid lump sum".

SECTION 105.1: AUTHORITY OF THE ENGINEER

The Engineer shall resolve all questions which arise as to the quality and acceptability of materials furnished, work performed, manner of performance, rate of progress of the work, interpretation of the plans and Specifications, acceptable fulfillment of the contract, compensation, and disputes and mutual rights between Contractors under the Specifications. The Engineer shall determine the amount and quantity of work performed and materials furnished.

All decisions of the Engineer shall, when so requested, be rendered in writing. They shall be final and conclusive in all matters unless within ten (10) days after such decision the Contractor applies in writing to the Board of Public Works for a review of such decision.

Any change proposed by a Contractor in SBE subcontractors, vendors or suppliers from those SBEs indicated on the SBE Compliance Report must be approved by the Engineer and the City's Manager of the Affirmative Action Division (hereafter, AAD). When requested, such decision shall be rendered in writing. Such decisions shall be final and conclusive in all matters unless within ten (10) days after such decision the Contractor or the affected SBE applies in writing to the Board of Public Works for a review of such decision.

In the event the Engineer and the AAD disagree over the proper decision to be made regarding an SBE, the Mayor shall appoint a third person to resolve the disagreement, within 30 days of appointment. The decision thus rendered may be reviewed by the Board of Public Works upon request of the Contractor or the affected SBE as set forth in Sections 105.1 and 105.2 of the City's standard specifications.

SECTION 105.12: COOPERATION OF THE CONTRACTOR

Contractor to note, there are soccer games at night or on weekends that could not be re-located or re-scheduled during this construction timetable. Therefore the contractor is required to schedule the work in such a way that the lights and field are functional for each scheduled game until the day after the last game which is November 9, 2013, at which time the facility will be shut down for the duration of the contract. The October and November schedules are included in these specifications.

SECTION 105.9: SURVEYS, POINTS, AND INSTRUCTION

The contractor will be responsible for all layout, lines and/or grades required to complete the work for the installation of the light poles and the PA system. The contractor will layout any trench routes, and/or conduit routes then call the Parks Division for location/route approval prior to any digging. The City of Madison Parks Division will make available to the surveyor an electronic copy of the project upon request. Any questions regarding this project should be directed to Thomas Maglio at the Parks Division @ 266-6518. Any questions regarding surveying issues should be directed to Dan Rodman of the Parks Division @ 266-6674.

SECTION 107.2: PROTECTON/RESTORATION OF PROPERTY

The contractor must repair any damage to Breese Stevens Field from construction operations outside of the work area, at the contractor's expense. Contractor shall protect all facility improvements in and around the soccer complex.

SECTION 109.2: PROSECUTION OF THE WORK

Construction work must begin within seven (7) calendar days after the date appearing on mailed notice to do so. Once started, work shall be carried on at a rate so as to secure full completion within the contract time, the rate of progress and the time of completion being essential conditions of this Agreement.

The anticipated start date of this contract is October 14, 2013. The calendar completion date of this contract is December 20, 2013. Contractor to note, this is a tight construction timetable. The successful bidder should know that to complete the work in the time allotted, weekend work may be necessary and will be allowed as long as it does not interfere with the scheduled weekend soccer games.

Work on this project should be scheduled through Thomas J. Maglio from the Parks Division, at 266-6518 or (cell) 576-9673

SECTION 109.9 LIQUIDATED DAMAGES

Should the Contractor fail to complete the work within the time specified in the contract, or within such extra time as may have been allowed by extensions, there shall be deducted from any monies due or that may become due the Contractor, or in the event no monies are due, the Contractor shall pay to the City, the sum set forth in the following schedule for each and every day that the work shall remain uncompleted. This sum shall be considered and treated not as a penalty but as fixed, agreed and liquidated damages due the City from the Contractor by reason of inconvenience to the public, added cost of engineering and supervision, maintenance of detours and other items which have caused an expenditure of public funds resulting from the Contractor's failure to complete the work within the time specified in the contract.

The fixed, agreed and liquidated damages shall be assessed, unless otherwise specified, in accordance with the following schedule, which represents the City's estimate of damages at the time of contracting:

CONTRACT AMOUNT			
ORIGINAL CONTRACT AMOUNT		DAILY CHARGE	
From More Than	To and Including	Calendar Day	Working Day
$	$	$	$
0	50,00	150.00	300.00
50,000	100,00	180.00	360.00
100,000	300,00	295.00	590.00
300,000	500.00	480.00	960.00
500,000	1,000,000	665.00	1,330.00
$	$	$	$
1,000.000	---	990.00	1,980.00

Professional

Engineering

Services

Breese Stevens Field Lighting/Sound System Improvements

Contract 7044

Technical Specifications

City of

Madison-Parks Division

Madison, WI

May 2013

STRAND ASSOCIATES®

TECHNICAL SPECIFICATIONS

BREESE STEVENS FIELD LIGHTING/SOUND SYSTEM IMPROVEMENTS
CONTRACT 7044
CITY OF MADISON-PARKS DIVISION
MADISON, WISCONSIN

Prepared by:

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Madison, WI 53715
www.strand.com

May 2013

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SECTION 00010

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BREESE STEVENS FIELD LIGHTING/SOUND SYSTEM IMPROVEMENTS
CONTRACT 7044
CITY OF MADISON-PARKS DIVISION
MADISON, WISCONSIN

END OF SECTION

SPECIFICATIONS

SECTION 01010

SUMMARY OF WORK

PART 1–GENERAL

1.01 DIVISION ONE

A. The requirements of Division 1 apply to all sections of the Contract.

1.02 PROJECT SCOPE

A. CONTRACTOR shall provide all items, articles, materials, operations or methods mentioned or scheduled on the Drawings or herein specified: including all labor, supervision, equipment, incidentals, taxes, and permits necessary to complete the Work as described within the Contract Documents. CONTRACTOR shall install all items provided by OWNER as mentioned or scheduled on the Drawings or herein specified.

1.03 CONTRACT DOCUMENTS–INTENT AND USE

A. Intent of Documents:
   1. Singular notations and specifications shall be considered plural where application is reasonably inferred.
   2. Mention or indication of extent of work under any division or Specification section is done only for convenience of CONTRACTOR and shall not be construed as describing all work required under that division or section.
   3. Some individual sections may contain a list of related sections. The list of related sections in individual sections is provided for the convenience of CONTRACTOR and is not necessarily all-inclusive. CONTRACTOR may not rely upon this listing for determination of scope of work. Other sections of the Specifications not referenced in individual sections shall apply as required for proper performance of the Work.
   4. Command type sentences may be used in the Contract Documents. These sentences refer to and are directed to CONTRACTOR.
   5. Symbols for various elements and systems are shown on the Drawings. Should there be any doubt regarding the meaning or intent of the symbols used, a written interpretation shall be obtained from ENGINEER.

B. Use of Documents:
   1. CONTRACTOR shall examine all Specifications and Drawings for the Work, including those that may pertain to Work CONTRACTOR does not normally perform with its own forces.
   2. CONTRACTOR shall use all of the Project Drawings and Specifications:
      a. For a complete understanding of the Project.
      b. To determine the type of construction and systems required.
      c. For coordination with OWNER and utility company.
      d. To determine what other work may be involved in various parts or phases.
      e. To anticipate and notify others when work by others will be required.
      f. And all other relevant matters related to the project.
   3. CONTRACTOR is also bound by all requirements of the Contract Documents which are applicable to, pertain to, or affect its Work as may be shown or inferred by the entire set of Project Drawings and Specifications.

1.04 CONSTRUCTION REQUIREMENTS

A. In general, the following Contract completion Milestones shall be followed:
   1. Milestone 1 Completion **(November 1, 2013)**: CONTRACTOR shall by that date, have completed all belowgrade conduit and handhole installations.
   2. Milestone 2 Completion **(December 1, 2013)**: CONTRACTOR shall by that date, have completed and placed in service all sound system equipment.
   3. Substantial Completion **(December 27, 2013)**: CONTRACTOR shall by that date, have the sports lighting system and sound system substantially completed.

B. General Information:
   1. Currently, the Breese Stevens Athletic Field has an existing sports lighting system consisting light fixture assemblies on top of five 80-foot galvanized steel poles and three 80-foot truss-towers. The light fixtures are powered through a dedicated utility metering CT cabinet located in a normally unoccupied room below the stadium seating. The electric service from the CT cabinet is routed through a contactor enclosure that feeds a 277/480 volt distribution panel. The light fixture assemblies are fed from circuit breakers in the existing distribution panel, including an underground 200 amp feeder that runs across the field to a concrete pullbox with distribution circuit breakers for fixture assemblies on the south side of the field.
   2. The facility, including the new or existing lighting system, shall be available to be used during the times reserved for activities, regardless of work underway. A schedule of activities is available upon request from OWNER.

C. Construction Sequence:
   1. The following construction sequence is provided as a general guideline for the information and for the benefit of CONTRACTOR. This construction sequence is not intended to dictate means, method of construction, or direct construction activities. This construction sequence is a conceptual general construction sequence with minimum recommended outage, shutdowns, and operating units to be maintained in service. The general construction sequence is projected to allow the Work to be completed while maintaining the ability to use the field and new or existing lighting systems for scheduled activities at the facility. It is not intended to be all inclusive and does not list all work elements or details that are required to complete the Work or place equipment in service. CONTRACTOR shall be responsible for implementing any additional details required, including temporary power and controls, or temporary construction at no additional cost to OWNER.
   2. CONTRACTOR may propose alternate sequence or modifications to this sequence. OWNER will review the proposed modification and determine if such modification of the sequence interferes with the proper use of the facility. Any modifications to this general construction sequence shall be proposed in writing and shall be approved by OWNER prior to their implementations.
   3. The following is a suggested sequence of construction:
      a. Install all underground conduit and wiring including associated junction and pull boxes.
      b. Install new lighting control panel, control power, remote control switch, and all associated conduit and wiring.
      c. Install new lighting system electrical component enclosures and all associated conduit and wiring.
      d. Install sound system equipment racks, wireless microphone equipment, jacks, etc., and all associated conduit and wire.

e. Remove existing light fixture assemblies from poles located on the north side of the field.
f. Install new light fixture assemblies on poles located on the north side of the field and all associated conduit and wiring to allow fixtures to be operated during scheduled facility activities.
g. Install loudspeakers on poles located on the north side of the field and all associated conduit and wiring.
h. Remove existing light fixture assemblies from poles located on the south side of the field.
i. Install new light fixture assemblies on poles located on the south side of the field and all associated conduit and wiring to allow all fixtures to be operated during scheduled facility activities.

1.05 CONTRACTOR USE OF SITE

A. General:
1. The “area of the site” referred to in these specifications shall be as shown on the Drawings. If the “area of the site” is not shown, OWNER’s property lines, the project right-of-way, or the easements obtained for the project shall be considered the “area of the site.”
2. Construction activities shall be confined within the “area of the site” limits.
3. From the start of work to completion, CONTRACTOR is responsible for the care of the site and the premises which are affected by operations of Work of this Contract.
4. Except for permanent site improvements provided under the Contract, CONTRACTOR shall restore property disturbed during the Work to the conditions which previously existed.
5. Work in occupied spaces shall be restricted to specified Work and essential activities, such as making necessary connections and extending services or constructing temporary access ways. Such work shall be scheduled in advance with OWNER.

B. Parking and Deliveries:
1. CONTRACTOR is responsible for control of traffic by vehicles and persons within the limits of its operations.
2. Parking for employees, subcontractors, and agents of CONTRACTOR shall be in areas subject to approval of OWNER.
3. Access to the site for delivery of construction material or equipment shall be subject to approval of OWNER.

1.06 EXISTING SERVICES, STRUCTURES, AND UNDERGROUND FACILITIES

A. Interruption of the existing athletic field lighting system, irrigation systems, and similar work shall be kept to an absolute minimum and shall be limited to times approved by OWNER. The AT&T cellular antennas, located on the southeast light pole, shall not be out of service at any time. Coordinate work around the antennas with AT&T representative Mike Jansen at (262) 785-7102.

B. Work shall not commence until all labor, materials, and equipment are available so Work can continue without interruption or delay.

C. Should uncharted or incorrectly charted piping or other utilities be encountered during installation, notify OWNER and consult with utility owner immediately for directions.

D. Cooperate with OWNER and utility companies in keeping respective services and facilities in operation, and repair any damaged utilities to satisfaction of utility owner.

E. CONTRACTOR shall not interrupt existing utilities serving facilities occupied and used by OWNER or others, except when permitted in writing by OWNER.

F. Any accidental interruption of services shall be repaired immediately, including provision of temporary facilities until permanent repairs can be made.

G. Wisconsin Statute 182.0175(2) requires, among other provisions, that before excavation or demolition begins, reasonable advance notice not less than three working days prior to the start of the excavation or demolition of the intent to excavate or demolish and the commencement date be provided to the owners of the Underground Facilities in and near the construction area whose facilities may be affected by the excavation or demolition. As part of this notification requirement, CONTRACTOR shall contact Digger's Hotline (811 or 1-800-242-8511). CONTRACTOR shall be aware that not all owners participate in the Digger's Hotline program. A call to this agency shall not absolve CONTRACTOR of the requirements of this statute. CONTRACTOR shall comply with all other provisions of the statute though not enumerated herein.

H. CONTRACTOR shall proceed with caution in the excavation and preparation of the Site so the exact location of structures and Underground Facilities can be determined. CONTRACTOR shall include in the Contract Price any costs for temporary or permanent relocations of such structures and Underground Facilities required to complete the Work unless specifically indicated otherwise in the Specifications.

I. CONTRACTOR shall keep an accurate and complete record of all such structures and Underground Facilities encountered and shall provide OWNER a copy of this record. The record shall include a description of the item encountered, opinion as to conditions, and adequate measurements and depths so that the item can be located in the future.

J. CONTRACTOR shall inspect all Underground Facilities for condition and soundness. Unsound conditions shall be reported to the facility owner immediately after exposing. CONTRACTOR shall not proceed with the work until the facility owner has been notified. OWNER shall then be given time to inspect and correct, if required, the Underground Facility. CONTRACTOR may make claim under the provisions of Articles 11 and 12 of the General Conditions should CONTRACTOR feel a price or time adjustment is justified.

K. Any additional costs incurred because of failure of CONTRACTOR to report the condition of any and all existing structure or Underground Facility encountered shall be paid for by CONTRACTOR.

L. Whenever ENGINEER feels it is necessary to explore and excavate to determine the location of existing structures and Underground Facilities, CONTRACTOR shall make explorations and excavations for such purposes. If CONTRACTOR is required to perform additional work in making the explorations and excavations, extra compensation will be allowed as provided for in the General Conditions.

1.07 PROTECTION OF WORK AND IMPROVEMENTS

A. CONTRACTOR shall protect the property of OWNER, existing improvements, and the Work installed by CONTRACTOR and others from abuse, damage, dust, debris, and other objectionable materials resulting from construction activities.

B. CONTRACTOR shall provide suitable covers, partitions, or other dust and fume containment devices to suit construction operations.

C. CONTRACTOR shall keep property, existing improvements, and the Work including structures, mains, fittings, and accessories free from dirt and foreign matter at all times.

D. CONTRACTOR shall provide temporary plugging of openings, holes, and pipe ends that are existing or that CONTRACTOR has installed.

E. Property, improvements, and Work damaged by CONTRACTOR shall be repaired or replaced by CONTRACTOR to the satisfaction of OWNER.

1.08 AVAILABILITY OF LANDS

A. Easements were not obtained for this project. CONTRACTOR shall contain its operation to within the rights-of-way or lands upon which the work is to be performed.

PART 2–PRODUCTS

NOT APPLICABLE

PART 3–EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 01019

CONTRACT CONSIDERATIONS

PART 1–GENERAL

1.01 SUMMARY

A. Work Included: Measurement and Payment–Lump Sum.

1.02 MEASUREMENT AND PAYMENT–LUMP SUM

A. No separate measurement for payment will be performed for Lump Sum Work.

B. CONTRACTOR shall estimate percentage of Work completed. OWNER will review CONTRACTOR's estimate of quantity of Work completed.

C. Payment will be made based on the percentage of the Contract completed less retainage and/or liquidated damages.

D. Unless noted otherwise, all Work described in the Specifications and/or shown on the Drawings shall be included in the Lump Sum Bid.

PART 2–PRODUCTS

NOT APPLICABLE

PART 3–EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 01039

COORDINATION, FIELD ENGINEERING, AND MEETINGS

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Coordination.
   2. Field engineering.
   3. Progress meetings.
   4. Preinstallation meetings.

1.02 COORDINATION

A. CONTRACTOR shall coordinate scheduling, submittals, and work of the various sections of the work to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later. See Section 01010–Summary of Work for specific construction sequence.

B. CONTRACTOR shall verify utility requirements and characteristics of operating equipment are compatible with building utilities and coordinate Work of various sections having interdependent responsibilities for installing, connecting to, and placing in service such equipment.

C. CONTRACTOR shall coordinate space requirements and installation of electrical work which is indicated diagrammatically on the Drawings and shall follow routing shown for conduit as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. In finished areas, except as otherwise indicated, CONTRACTOR shall conceal conduit and wiring within the construction and coordinate locations of devices with finish elements.

E. CONTRACTOR shall coordinate completion and clean up of Work of separate sections in preparation for substantial completion.

F. CONTRACTOR shall coordinate access to Site for correction of defective Work and Work not in accordance with Contract Documents to minimize disruption of OWNER’s activities.

1.03 FIELD ENGINEERING

A. CONTRACTOR shall provide field engineering services as required to establish elevations, lines, and levels utilizing recognized engineering survey practices.

B. CONTRACTOR shall furnish all required plummets and graduated poles to check all Work.

C. If stakes and boards have to be reset because of negligence of CONTRACTOR, CONTRACTOR shall bear the cost of such work.

D. If laser beam is used, CONTRACTOR shall check its Work against intermediate grade stakes provided between manholes. Prior to initial use of the laser, CONTRACTOR shall

set up laser on ground surface and check line and gradient controls. Lasers not functioning properly shall be immediately removed.

E. CONTRACTOR shall be responsible for all lines, elevations, and measurements of buildings, structures, piping, utilities, and other work executed by CONTRACTOR under the Contract. CONTRACTOR must exercise proper precaution to verify figures before laying out the Work and will be held responsible for any error resulting from its failure to exercise such precaution.

1.04 PROGRESS MEETINGS

A. Progress meetings will be held throughout progress of the Work at intervals agreed to by OWNER and CONTRACTOR. Interval will generally be biweekly.

B. CONTRACTOR's project manager and job superintendent shall attend as appropriate to address agenda topics for each meeting. CONTRACTOR's representatives shall have authority to bind CONTRACTOR to decisions at the meetings. A meeting agenda shall be prepared by CONTRACTOR and delivered to OWNER at least 2 days prior to each meeting.

C. The project schedule shall be updated before and reviewed at each progress meeting. CONTRACTOR shall provide the following information in written form at each meeting.
   1. Construction progress, including:
      a. Activities completed this reporting period.
      b. Activities in progress this reporting period.
      c. Activities scheduled to commence this reporting period.
   2. Description of problem areas.
   3. Current and anticipated delays.
      a. Cause of the delay.
      b. Corrective action and schedule adjustments to correct the delay.
      c. Impact of the delay on other activities, on milestones, and on completion dates.
   4. Changes in construction sequence.

D. CONTRACTOR shall prepare and distribute minutes to all attending parties.

1.05 PREINSTALLATION MEETING

A. When required in individual specification sections, CONTRACTOR shall convene a preinstallation meeting at Work Site prior to commencing Work of the section.

B. CONTRACTOR shall require attendance of parties directly affecting or affected by work of the specific section.

C. CONTRACTOR shall notify OWNER seven days in advance of meeting date.

D. CONTRACTOR shall prepare agenda and preside at meeting:
   1. Review conditions of installation, preparation, and installation procedures.
   2. Review coordination with related work.

E. CONTRACTOR shall record minutes and distribute copies to participants within two days after meeting; two copies to ENGINEER, participants, and those affected by decisions made.

PART 2–PRODUCTS

NOT APPLICABLE

PART 3–EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 01045

CUTTING, PATCHING, AND ALTERATIONS

PART 1–GENERAL

1.01 SUMMARY

A. Work Included: CONTRACTOR shall be responsible for all cutting, fitting, patching, and other alterations required to complete the Work as specified herein or to:
   1. Make its several parts fit together properly.
   2. Uncover portions of the Work to install improperly sequenced Work.
   3. Remove and replace defective Work.
   4. Remove and replace Work not conforming to requirements of the Contract Documents.
   5. Remove samples of installed Work as specified for testing.
   6. Provide penetrations of surfaces for installation and electrical conduit.
   7. Rehabilitate or renovate existing spaces.

1.02 REFERENCES

A. ANSI A10 Safety Requirements for Construction and Demolition.

1.03 QUALITY ASSURANCE

A. CONTRACTOR shall perform all cutting, patching, and alterations in strict accordance with pertinent requirements of these Specifications.

B. Except as modified by governing codes, CONTRACTOR shall comply with the applicable provision and recommendations of ANSI A10.

1.04 SUBMITTALS

A. CONTRACTOR shall submit a written request to OWNER well in advance of executing any cutting or alteration which affects the following:
   1. Work of OWNER or any separate contractor.
   2. Structural value or integrity of any element of the Project.
   3. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.
   4. Efficiency, operational life, maintenance, or safety of operational elements.
   5. Visual qualities of sight-exposed elements.

B. The request shall include:
   1. Description of affected work.
   2. The necessity for cutting, patching, or alteration.
   3. Effect on work of OWNER, any separate contractor, or on the structural or weather-proof integrity of the Project.
   4. Description of proposed work to include:
      a. Scope of cutting, patching, or alteration.
      b. Trades who will execute the work.
      c. Products proposed to be used.

d. Extent of refinishing to be done.

5. Alternatives to cutting and patching.
6. Written permission of any separate contractor whose work will be affected.

C. Submit written notice to OWNER designating the date and the time the Work will be uncovered or executed.

1.05 SCHEDULING AND COORDINATION

A. All work under this section shall be coordinated with OWNER's work forces and those of other contractors and shall be accomplished at times acceptable to OWNER.

B. Before starting any work relating to existing utilities (electrical, sewer, water, heat, gas, fire lines, etc.) that will temporarily discontinue or disrupt service to the existing facility, notify OWNER 72 hours in advance and obtain OWNER's approval before proceeding with this phase of the work. Temporary facilities, if required, shall be in place prior to disruption of service.

PART 2–PRODUCTS

2.01 NEW MATERIALS

A. For replacement of work removed, CONTRACTOR shall use materials which comply with the pertinent sections of these Specifications.

B. All new materials for patching and extending work shall match existing products and work.

C. CONTRACTOR shall determine type and quality of existing products by inspection and any necessary testing and workmanship by use of existing as the standard.

2.02 UNSALVAGEABLE MATERIALS

A. Materials or items demolished and not designated to become the property of OWNER or not designated to be reinstalled shall become the property of CONTRACTOR and shall be removed from the site and legally and properly disposed of by CONTRACTOR.

B. Materials shall be removed by CONTRACTOR in a manner that will avoid damage to materials or equipment to remain.

PART 3–EXECUTION

3.01 INSPECTION

A. CONTRACTOR shall inspect existing conditions including elements subject to movement or damage during cutting, patching, and other alterations.

B. After uncovering the work, CONTRACTOR shall inspect conditions affecting installation of new products or performance of new work.

C. CONTRACTOR shall report unsatisfactory or questionable conditions to OWNER in writing.

D. CONTRACTOR shall not proceed with work until unsatisfactory or questionable conditions are resolved.

E. Beginning of cutting, patching, and alterations work means acceptance of existing conditions by CONTRACTOR.

3.02 PREPARATION AND PROTECTION

A. CONTRACTOR shall provide temporary bracing, shoring, needling, and support of the structures during alterations work as necessary to prevent collapse, settling, or deflection and to protect persons and property from injury or damage.

B. Temporary supports must adequately carry all existing and imposed load.

C. CONTRACTOR shall provide and maintain temporary protection of surface finishes, equipment, and adjacent work designated to remain where demolition, removal, and new work is being done, connections are being made, materials are being handled, or equipment is being removed.

D. CONTRACTOR shall provide temporary partitions or barriers to contain all dust, dirt, and debris from entering into finished areas or areas where OWNER is storing equipment.

E. CONTRACTOR shall provide adequate fire protection in accordance with local Fire Department requirements.

F. CONTRACTOR shall provide waterproofing, weather protection, heat, and other facilities for that portion of the work which may be exposed by cutting and patching, demolition, or other alterations.

G. CONTRACTOR shall cut, move, or remove items as necessary for access to alterations and renovations work and replace and restore at completion of work.

H. CONTRACTOR shall be responsible for any damage to the existing structure or its contents directly or indirectly by its crews or those of its subcontractors.

3.03 PERFORMANCE

A. CONTRACTOR shall accomplish all work of cutting, removal, demolition, patching, or other alterations using only persons skilled in the appropriate trade.

B. CONTRACTOR shall execute the work in a careful and orderly manner with the least possible disturbance to the public and to the occupants of the building.

C. CONTRACTOR shall execute cutting and demolition by methods which will prevent damage to other work and will provide proper surfaces to receive installation of repairs.

D. CONTRACTOR shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes.

E. CONTRACTOR shall fit work airtight to conduit penetrations through surfaces.

3.04 DEMOLITION, CUTTING, AND REMOVAL

A. Cutting and removal of construction shall be performed by CONTRACTOR so as not to cut or remove more than is necessary and so as not to damage adjacent work.

B. CONTRACTOR shall cut out embedded anchorages and attachment items as required to properly provide for patching and repair of the respective finishes.

C. CONTRACTOR shall not cut structural work in a manner resulting in a reduction of load-carrying capacity or load/deflection ratio.

D. CONTRACTOR shall not cut operational elements and safety components in a manner resulting in decreased performance, shortened useful life, or increased maintenance.

E. CONTRACTOR shall not cut work exposed to view (exterior or interior) in a manner resulting in noticeable reduction of visual qualities as determined by OWNER.

F. Construction that is to remain which is loosened, cracked, or otherwise damaged or defaced as a result of careless cutting or demolition and is unsuitable for use intended shall be removed and replaced at no additional cost to OWNER.

G. CONTRACTOR shall clean demolished areas and remove debris, waste, and rubbish from the building at the conclusion of each day's work.

H. CONTRACTOR shall not let piled waste material endanger the structure.

3.05 PATCHING, EXTENDING, AND MATCHING

A. Patching work shall conform to the standards of the Specifications where applicable, and where not specified, work shall conform to the highest standards of the applicable trade.

B. CONTRACTOR shall patch construction to match adjacent work unless noted otherwise.

C. Patching or restoration shall be carried to natural breaks (e.g., corners) wherever possible.

D. CONTRACTOR shall provide adequate support to substrate for patching finishes.

3.06 UNANTICIPATED ELECTRICAL WORK EXPOSED

A. Removals, capping, or otherwise terminating services which are abandoned shall be accomplished without additional cost to OWNER.

B. Relocation of services resulting from unanticipated conflicts of new and existing work in concealed spaces shall be paid for in accordance with the General Conditions.

END OF SECTION

SECTION 01060

REGULATORY REQUIREMENTS

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. OSHA Requirements.
   2. Roadway Limits.
   3. Permits.

1.02 OSHA REQUIREMENTS

A. All work including site safety, equipment, materials, and fabricated items provided under the Contract shall comply with the provisions of the “Occupational Safety and Health Act.”

1.03 ROADWAY LIMITS

A. CONTRACTOR shall comply with roadway weight restrictions including seasonal weight restrictions.

1.04 PERMITS

A. No permits were obtained by OWNER for this Project. CONTRACTOR shall obtain required permits. Where the requirements of any permit are more restrictive than the Drawings or the Specifications, the permit requirements shall govern.

B. Any permits required for dewatering operations shall be obtained and paid for by CONTRACTOR.

PART 2–PRODUCTS

NOT APPLICABLE

PART 3–EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 01090

REFERENCE STANDARDS AND DEFINITIONS

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Reference Standards:
      a. Throughout the Contract Documents, reference is made to codes and standards which establish qualities and types of workmanship and materials, and which establish methods for workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics.
      b. Where materials or workmanship are required by these Contract Documents to meet or exceed the specifically named code or standard, it is CONTRACTOR's responsibility to provide materials and workmanship which meet or exceed that specifically named code or standard.
      c. It is also CONTRACTOR's responsibility, when so required by the Contract Documents, to deliver to ENGINEER all required proof that the material or workmanship, or both, meet or exceed the requirements of the specifically named code or standard.
   2. Definitions:
      a. A substantial amount of specification language constitutes definitions for terms found in other Contract Documents, including the Drawings which must be recognized as diagrammatic in nature and not completely descriptive of requirements indicated thereon.
      b. Certain terms used in the Contract Documents are defined generally in this section to supplement definitions of the Agreement, General Conditions, Supplementary Conditions, and other general contract documents.
      c. Definitions and explanations of this section are not necessarily either complete or exclusive, but are general for the Work.

B. Related Work Described Elsewhere: The specific naming of codes or standards occurs on the Drawings and in other sections of these Specifications.

1.02 QUALITY ASSURANCE

A. Familiarity with Pertinent Codes and Standards:
   1. It is CONTRACTOR's responsibility to verify the requirements of the specifically named codes and standards and to verify that the items procured for use in this Work meet or exceed the specified requirements.
   2. When required by individual sections of these specifications, CONTRACTOR shall obtain a copy of each pertinent code or standard and maintain the copies at the job site during submittals, planning, and progress of the Work until Substantial Completion of the Work is attained.

B. Overlapping or Conflicting Requirements:
   1. Where compliance with two or more industry standards or sets of requirements are specified, and the overlapping of those standards or requirements establishes different or conflicting minimums or levels of quality, the most stringent requirement (which is

generally recognized to be also most costly) is intended and will be enforced, unless more detailed language written directly into Contract Documents clearly indicates that a less stringent requirement is acceptable.

2. Refer all uncertainties to ENGINEER for decision before proceeding.

1.03 REFERENCE STANDARDS

A. Applicable standards of the construction industry are made a part of the Contract Documents by reference as if copied directly into the Contract Documents, or as if published copies were bound herewith. See Article 3.02 of the General Conditions for additional provisions regarding references.

B. Standards referenced directly in the Contract Documents or by governing regulation, have precedence over nonreferenced standards which are recognized in industry for applicability to the Work.

C. Nonreference standards are hereby defined to have no particular applicability to the work except as a general measurement of whether the Work complies with standards recognized in the construction industry.

D. Reference standards and codes listed in these specifications may include, but are not necessarily limited to, standards or codes published by the following agencies and organizations:

1. AA Aluminum Association
   1525 Wilson Boulevard, Arlington, VA 22209

2. AAMA American Architectural Manufacturer's Association
   1827 Walden Office Square Suite 550, Schaumberg, IL 60173-4268

3. AASHTO American Association of State Highway & Transportation Officials
   444 North Capitol Street NW Suite 249, Washington, DC 20001

4. ACI American Concrete Institute
   38800 Country Club Drive, Farmington Hills, MI 48331-3439

5. AI Asphalt Institute
   2696 Research Park Drive, Lexington, KY 40511-8480

6. AISC American Institute of Steel Construction
   One East Wacker Drive Suite 700, Chicago, IL 60601-1802

7. AISI American Iron and Steel Institute
   25 Massachusetts Avenue NW Suite 800, Washington, DC 20001

8. ANSI American National Standards Institute
   25 West 43rd Street, New York, NY 10036

9. APA American Plywood Association
   7011 South 19th, Tacoma, WA 98466-5333

10. API	American Petroleum Institute 1220 L Street NW, Washington, DC 20005-4070
11. ARI	Air-Conditioning & Refrigeration Institute 4100 North Fairfax Drive Suite 200, Arlington, VA 22203
12. ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers 1791 Tullie Circle NE, Atlanta, GA 30329
13. ASME	American Society of Mechanical Engineers Two Park Avenue, New York, NY 10016-5990
14. ASSE	American Society of Sanitary Engineering 901 Canterbury Suite A, Westlake, OH 44145
15. ASTM	ASTM International 100 Barr Harbor Drive, West Conshohoken, PA 19428-2959
16. AWI	Architectural Woodwork Institute 46179 Westlake Drive Suite 120, Potomac Falls, VA 20165-5874
17. AWPA	American Wood Protection Association P.O. Box 361784, Birmingham, AL 35236-1784
18. AWS	American Welding Society 8669 Doral Boulevard Suite 130, Doral, FL 33166
19. AWWA	American Water Works Association 6666 West Quincy Avenue, Denver, CO 80235
20. BHMA	Builder's Hardware Manufacturers Association 355 Lexington Avenue 15th floor, New York, NY 10017
21. BIA	Brick Industry Association 1850 Centennial Park Drive Suite 301, Reston, VA 20191
22. CRSI	Concrete Reinforcing Steel Institute 9333 North Plum Grove Road, Schaumburg, IL 60173
23. EJMA	Expansion Joint Manufacturers Association 25 North Broadway, Tarrytown, NY 10591
24. FM	FM Global FM Global Corporate Offices, 270 Central Avenue, Johnston, RI 02919
25. FTI	Facing Tile Institute Box 8880, Canton, OH 44711

26. GA	Gypsum Association 6525 Belcrest Road Suite 480, Hyattsville, MD 20782
27. GANA	Glass Association of North America 800 SW Jackson Street Suite 1500, Topeka, KS 66612-1200
28. ICC	International Code Council 500 New Jersey Avenue NW 6th Floor, Washington, DC 20001
29. IES	Illuminating Engineering Society 120 Wall Street, Floor 17, New York, NY 10005-4001
30. MIL	Military Specifications Naval Publications and Forms Center 5801 Tabor Avenue, Philadelphia, PA 19120
31. NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Road Building C Suite 312, Glen Ellyn, IL 60137
32. NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive, Herndon, VA 20171-4662
33. NECA	NECA National Electrical Contractors Association 3 Bethesda Metro Center Suite 1100, Bethesda, MD 20814
34. NEMA	National Electrical Manufacturers Association 1300 North 17th Street Suite 1752, Rosslyn, VA 22209
35. NFPA	National Fire Protection Association 1 Batterymarch Park, Quincy, MA 02169-7471
36. NIST	National Institute of Standards and Technology (U.S. Department of Commerce), 100 Bureau Drive, Stop 1070 Gaithersburg, MD 20899-1070
37. NRCA	National Roofing Contractors Association 10255 West Higgins Road Suite 600, Rosemont, IL 60018-5607
38. NSF	National Sanitation Foundation International P.O. Box 130140, 789 North Dixboro Road, Ann Arbor, MI 48113-0140
39. OSHA	Occupational Safety & Health Administration 200 Constitution Avenue NW, Washington, DC 20210
40. PCA	Portland Cement Association 5420 Old Orchard Road, Skokie, IL 60077
41. PCI	Prestressed Concrete Institute 200 West Adams Street Suite 2100, Chicago, IL 60606

42. SAE Society of Automotive Engineers
SAE World Headquarters
400 Commonwealth Drive, Warrendale, PA 15096-0001

43. SDI Steel Deck Institute
P.O. Box 25, Fox River Grove, IL 60021

44. SDI Steel Door Institute
30200 Detroit Road, Westlake, OH 44145-1987

45. SIGMA Sealed Insulating Glass Manufacturers Assoc.
401 North Michigan Avenue Suite 2400, Chicago, IL 60611

46. SJI Steel Joist Institute
234 Cheves Street, Florence, SC 29501

47. SMACNA Sheet Metal and Air Conditioning
Contractor's National Association
4201 Lafayette Center Drive, Chantilly, VA 20151-1219

48. SSPC Society for Protective Coatings
40 24th Street 6th Floor, Pittsburgh, PA 15222-4656

49. TCA Tile Council of America
100 Clemson Research Boulevard, Anderson, SC 29625

50. ICC International Code Council
500 New Jersey Avenue NW 6th Floor, Washington, DC 20001

51. UL Underwriters Laboratories
333 Pfingston Road; Northbrook, IL 60062

1.04 SUBMITTALS

A. For OWNER's records, CONTRACTOR shall submit copies of permits, licenses, certifications, inspection reports, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

1.05 DEFINITIONS

A. Indicated:
1. The term “indicated” is a cross-reference to details, notes, or schedules on the drawings, to other paragraphs or schedules in the specifications and to similar means of recording requirements in the Contract Documents.
2. Where terms such as “shown,” “noted,” “scheduled,” and “specified” are used in lieu of “indicated”, it is for the purpose of helping the reader locate cross-reference, and no limitation is intended except as specifically noted.

B. Approve (or Words of Similar Nature):
   1. Where used in conjunction with ENGINEER's response to submittals, requests, applications, inquiries, reports, and claims by CONTRACTOR, the meaning of the term “approve” will be held to the limitation of ENGINEER's responsibilities and duties as specified in Paragraph 1.02.B.1. of the General Conditions.
   2. In no case will “approval” by ENGINEER be interpreted as a release of CONTRACTOR from responsibility to fulfill requirements of the Contract Documents.

C. Minimum Requirements:
   1. Indicated requirements are for a specific minimum acceptable level of quality or quantity, as recognized in the industry.
   2. Actual work must comply with (or within specified tolerances) or exceed minimums.
   3. CONTRACTOR shall refer uncertainties to ENGINEER before proceeding.

D. Abbreviations: Abbreviations, where not defined in the Contract Documents, will be interpreted to mean the normal construction industry terminology.

PART 2–PRODUCTS

NOT APPLICABLE

PART 3–EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Whenever possible throughout the Contract Documents, the minimum acceptable quality of workmanship and materials has been defined either by manufacturer's name and catalog number or by reference to recognized industry standards.
   2. To facilitate CONTRACTOR's understanding of the design intent, procedures have been established for advance submittal of design data and for its review or rejection by OWNER.
   3. The type of submittal requirements specified in this section include progress schedule, shop drawings, product data, samples, and other miscellaneous work related submittals.

B. Related work described elsewhere: More detailed requirements for submittals are described in other sections of these specifications for some materials and equipment. They are to be considered additional requirements to supplement the requirements specified in this section. Submittals shall conform to Article 6 of the General Conditions.

C. Definitions: "Electronic Submittal" is defined as any submittal transmitted electronically to ENGINEER for review.

1.02 IDENTIFICATION OF SUBMITTALS

A. CONTRACTOR shall completely identify each submittal and resubmittal by showing at least the following information:
   1. Name and address of submitter, plus name and telephone number of the individual who may be contacted for further information.
   2. Name and location of project and identification number.
   3. Drawing number and specifications section number to which the submittal applies.
   4. Include the date of each submittal or resubmittal.

1.03 GROUPING OF SUBMITTALS

A. Unless otherwise specifically permitted by OWNER, CONTRACTOR shall make all submittals in groups containing all associated items so that information is available for checking each item when it is received.

B. Partial submittals may be rejected as not complying with the provisions of the Contract Documents.

1.04 TIMING OF SUBMITTALS

A. CONTRACTOR shall make all submittals far enough in advance of scheduled dates of installation to provide required time for reviews, for securing necessary approval, for possible revision and resubmittal, and for placing orders and securing delivery.

B. The review period for submittals that are received after 3 P.M. shall commence on the following business day.

1.05 CONSTRUCTION PROGRESS SCHEDULE

A. Submit initial schedule in duplicate within 10 days after date of OWNER-CONTRACTOR Agreement.

B. Revise and resubmit as required.

C. Submit revised schedules with each Application for Payment, identifying changes since previous version.

D. Submit a horizontal bar chart with separate line for each major portion of Work or operation, identifying first workday of each week.

E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.

F. Indicate estimated percentage of completion for each item of Work at each submission.

G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates.

1.06 SHOP DRAWINGS

A. Shop drawings shall include specially prepared technical data for this project including drawings, diagrams, point-to-point wiring diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements, and similar information not in standard printed form for general application to a range of similar projects. Shop drawings shall be submitted for all manufactured or fabricated items. See individual technical sections for special requirements.

B. CONTRACTOR shall make all shop drawings accurately to scale and sufficiently large to show all pertinent aspects of the item and its method of connection to the work.

C. Shop drawings shall be checked, approved, and stamped by CONTRACTOR in accordance with the General Conditions before transmittal to OWNER for review and approval.

D. Complete shop drawings and descriptive data shall be submitted on all manufactured or fabricated items prior to 25% completion of the Work. Applications for payment beyond 25% of the Contract amount will not be recommended for payment until all shop drawings are submitted or a revised schedule for any remaining submittals is agreed to by OWNER.

E. CONTRACTOR shall submit shop drawings following the procedure described below. Except as noted, three color copies of shop drawings and descriptive data shall be submitted to OWNER for approval. One copy will be returned to CONTRACTOR if approved. If shop drawings are not approved or if they are stamped “Approved as Noted-Resubmit,” two corrected copies will be returned to CONTRACTOR for use in resubmittal. If CONTRACTOR desires more than one approved copy, submitted quantity shall be increased accordingly.

F. Hard copy shop drawings shall be submitted in 3-ring binders or 3-tab report covers.

G. Shop drawings submitted to OWNER will be reviewed and stamped “Approved,” “Approved as Noted,” “Approved as Noted-Resubmit,” or “Not Approved.” CONTRACTOR shall resubmit the above number of corrected shop drawings for all shop drawings stamped “Approved as Noted-Resubmit” and “Not Approved” and will continue this process until shop drawings are stamped “Approved” or “Approved as Noted.” If drawings are stamped “Approved as Noted-Resubmit,” fabrication may proceed in accordance with the marked-up shop drawings. Installation shall not proceed until shop drawings have been resubmitted and stamped “Approved” or “Approved as Noted.”

H. If shop drawings are stamped “Approved as Noted” or “Approved as Noted-Resubmit” and CONTRACTOR does not agree with revisions or cannot conform with revisions, fabrication shall not proceed and shop drawings shall be resubmitted with explanation of CONTRACTOR’s position.

I. All shop drawings used for construction site activities shall bear the “Approved” or “Approved as Noted” stamp of OWNER.

J. Arrangements may be made between CONTRACTOR and OWNER to provide additional copies of “Approved” shop drawings for field activity purposes.

K. Shop drawings shall include verification that the item meets applicable codes and standards.

1.07 PRODUCT DATA

A. CONTRACTOR shall provide product data as required to supplement shop drawings.

B. Product data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by CONTRACTOR to illustrate a material, product, or system for some portion of the work.

C. CONTRACTOR shall collect required product data into one submittal for each unit of work or system.

D. CONTRACTOR shall include manufacturer’s standard printed recommendations for application and use, compliance with standards, performance characteristics, wiring and piping diagrams and controls, component parts, finishes, dimensions, required clearances, and other special coordination requirements.

E. CONTRACTOR shall mark each copy of standard printed data to identify pertinent products, models, options, and other data.

F. CONTRACTOR shall supplement manufacturer’s standard data to provide information unique to the work.

1.08 RESUBMISSION REQUIREMENTS

A. Make any corrections or changes in the submittals required by OWNER.

B. Shop Drawings and Product Data:
   1. Revise initial drawings or data and resubmit as specified for initial submittal.
   2. Itemize in a cover letter any changes which have been made other than those requested by OWNER.

1.09 MANUFACTURER'S DIRECTIONS

A. Manufactured articles, materials, and equipment shall be stored, commissioned, operated, applied, installed, connected, erected, used, cleaned, and conditioned as directed by the manufacturer, unless specified to the contrary.

B. Wherever specifications call for work to be performed or materials to be installed in accordance with the manufacturer's printed instructions or directions, CONTRACTOR shall furnish copies as required for shop drawings of those instructions or directions to OWNER before installing the material or performing the work.

1.10 MAINTENANCE MANUAL

A. Prior to 50% completion of the Contract or at a minimum of 45 days prior to the scheduled start-up date of any individual item of equipment, whichever is earlier, CONTRACTOR shall furnish to OWNER four complete copies of a maintenance manual for all equipment furnished. Applications for payment beyond 50% of the contract amount will not be recommended for payment until all maintenance manuals are submitted or a revised schedule for remaining maintenance manuals is agreed to by OWNER.

B. The manuals shall include manufacturer's instructions for maintenance and operation for each item of electrical equipment. Manuals shall be specific for the equipment as installed; provide project specific inserts as required. Manuals shall contain: operation instructions, lubrication schedules, types and quantities, preventative maintenance program, spare parts list, parts lists, I.D. No. and exploded views, assembly instructions, parts supplier location, trouble shooting and startup procedures and, where applicable, test data and curves.

C. All sheets shall have reduced dimensions as described for shop drawings, and shall be furnished in 3-ring binders or 3-tab report covers.

1.11 MAINTENANCE MANUAL

A. Prior to substantial completion of the Contract, CONTRACTOR shall furnish to OWNER four complete copies of a maintenance manual for all equipment furnished and an electronic format compact disk of the maintenance manual in the most recent version of Adobe (.pdf) format identical to the hard copy. Applications for payment beyond 50% of the contract amount will not be recommended for payment until all maintenance manuals are submitted or a revised schedule for remaining maintenance manuals is agreed to by OWNER.

B. CONTRACTOR is responsible for producing an electronic version of the Equipment Operations and Maintenance (O&M) Manuals Manual. The Electronic Equipment O&M Manual shall be delivered in Portable Document Format (PDF). The entire manual may be converted to PDF via scanning or other method of conversion. Drawings or other graphics must be converted to PDF format and made part of the PDF document. The

CONTRACTOR shall provide all Equipment O&M Manuals in the electronic format as defined below.

C. The filename for the Equipment O&M Manual submittal will be provided with the request for final Equipment O&M Manuals. Filenames use the "eight dot three" convention (XXXXX_YY.PDF) where XXXXX is the specification section number and YY is an ID number. No one file shall be larger than 10 MB. If technical problems require that the submittal be divided into more than one file, a letter extension shall be added to the end of each filename.

D. (Example: 19876_01a.pdf). The number of files shall be kept to a minimum. Equipment O&M Manuals that span more than one file shall have the final Bookmark "Return to Table of Contents" which shall take the User to the first file on the Equipment O&M Manual.

E. All text (word processed), spreadsheets, and electronic graphics shall be delivered in portable document format (*.PDF). The resolution of all scanned images shall be a minimum of 300 dpi unless otherwise requested by OWNER. Scanned images shall be processed with the "original image with hidden text" option (Adobe Acrobat 6 or higher). This results in a clear image and provides for optical character recognition (OCR) and word search functionality. Graphical files shall be fully searchable. All submittals must be indexed with the Adobe Catalog feature. Placement and structure of index files shall be in accordance with Adobe's recommendations to minimize problems when transferring files. Successful searches for words or strings in the PDF document shall demonstrate proof of OCR.

F. Rotate pages viewed in landscape to the appropriate position for easy reading on a computer monitor.

G. Bookmarks shall be created in the navigation frame for each entry in the Table of Contents. Three levels deep is usually enough (i.e., "Chapter", "Section", "Subsection"); however, complex submittals like instrumentation and electrical may be required at the discretion of OWNER. When setting bookmarks for Chapter level heading, the page shall be displayed at Full Page. Section and Subsection level heading pages shall be displayed as a magnified view. Bookmarks shall be displayed as subordinate (to other bookmarks in their hierarchy set so that only the Chapter level headings are displayed.

H. Thumbnails shall be generated and embedded in each PDF file.

I. Files shall be delivered without Security features activated. Password protected files will be unacceptable.

J. The opening view for PDF files shall be set as follows:
   1. Initial View: Bookmarks and Page.
   2. Magnification: Fit In Window.
   3. Page Layout: Single Page.

K. The file shall open to the cover page of the Equipment O&M Manual with bookmarks to the left. The first bookmark shall be the name of Equipment O&M Manual.

L. The submittal shall be delivered on CD after all Equipment O&M Manuals have been received and approved. Each CD shall be labeled, at a minimum, as follows, including: 1) CD-ROM disks, 2) jewel cases, and 3) hard copies.

M. Manufacturer name, point of contact, telephone number, facsimile number, and e-mail address as appropriate.

N. Equipment name and/or O&M title spelled out in complete words.

Example “Operations and Maintenance Manual"
"Horizontal Centrifugal Nonclog Pump"

O. Specifications section number.

P. Project name.

Q. Date and File Name: Example "12-20-07", "19876_01.pdf"

R. CONTRACTOR shall reprocess any portion of the document that does not view or print to OWNER's satisfaction.

S. CONTRACTOR is fully responsible for obtaining any and all copyright permissions associated with conversion of this information to electronic format.

T. The manuals shall include manufacturer’s instructions for maintenance and operation for each item of mechanical and electrical equipment. Manuals shall be specific for the equipment as installed; provide project specific inserts as required. Manuals shall contain: operation instructions, lubrication schedules, types and quantities, preventive maintenance program, spare parts list, parts lists, I.D. No. and exploded views, assembly instructions, parts supplier location, trouble shooting and start-up procedures and, where applicable, test data and curves. All sheets shall have reduced dimensions as described for shop drawings, and shall be furnished in 3-ring binders or 3-tab report covers.

U. Two copies shall be submitted in a 3-ring binder or 3-tab report cover, and the remaining copies shall be furnished in 3-tab report covers, binder clips, or large envelopes.

V. All sheets shall have reduced dimensions as described for shop drawings, and shall be furnished in 3-ring binders or 3-tab report covers.

PART 2–PRODUCTS

NOT APPLICABLE

PART 3–EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1–GENERAL

1.01 SUMMARY

A. Work Includes:
   1. Quality Assurance–Control of Installation.
   2. Tolerances.
   3. Manufacturers' Field Services and Reports.

1.02 QUALITY ASSURANCE–CONTROL OF INSTALLATION

A. CONTRACTOR shall monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce Work of specified quality.

B. CONTRACTOR shall comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, CONTRACTOR shall request clarification from OWNER before proceeding.

D. CONTRACTOR shall comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Work shall be performed by persons qualified to produce workmanship of specified quality.

F. CONTRACTOR shall secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.03 TOLERANCES

A. CONTRACTOR shall monitor tolerance control of installed products to produce acceptable work and shall not permit tolerances to accumulate.

B. CONTRACTOR shall comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, CONTRACTOR shall request clarification from OWNER before proceeding.

C. CONTRACTOR shall adjust products to appropriate dimensions; position before securing products in place.

1.04 MANUFACTURERS' FIELD SERVICES AND REPORTS

A. When specified in individual specification sections or when requested by OWNER, CONTRACTOR shall require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, and quality of workmanship.

B. CONTRACTOR shall submit qualifications of observer to OWNER 30 days in advance of required observations.

C. CONTRACTOR shall report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

D. CONTRACTOR shall submit report in duplicate within 30 days of observation to OWNER for information.

PART 2–PRODUCTS

NOT APPLICABLE

PART 3–EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Temporary utilities.
   2. Temporary stairs and access.
   3. Temporary support facilities.
   4. Removal of temporary facilities.

B. CONTRACTOR shall arrange for and provide temporary facilities as required for proper and expeditious prosecution of the Work.

C. CONTRACTOR shall pay all costs, except as otherwise specified, until final acceptance of the Work unless OWNER makes arrangements for use of completed portions of the Work after substantial completion in accordance with the provisions of the General Conditions.

D. CONTRACTOR shall make all temporary connections to utilities and services in locations acceptable to OWNER and local authorities having appropriate jurisdiction.
   1. Furnish all necessary labor and materials.
   2. Make all installations in a manner subject to the acceptance of such authorities and OWNER.
   3. Maintain such connections.
   4. Remove temporary installation and connection when no longer required.
   5. Restore services and sources of supply to proper operating conditions.

1.02 TEMPORARY UTILITIES

A. Temporary Toilets: CONTRACTOR shall provide and maintain sanitary temporary chemical toilets located where approved by OWNER and in sufficient number required for the work force employed by CONTRACTOR.

B. Temporary Electrical Services: The facilities' existing electrical equipment and wiring may be used.

C. Weather Protection and Temporary Heat: CONTRACTOR shall provide weather protection to protect the Work from damage because of freezing, rain, snow, and other inclement weather.

D. Temporary Fire Protection: CONTRACTOR and Subcontractor(s) who maintain or provide an enclosed shed or trailer shall provide and maintain in operating order in each shed or trailer a minimum of one fire extinguisher. More extinguishers shall be provided as necessary. Fire extinguishers shall be minimum dry chemical, nonfreezing-type, UL rating 2A-30BC, with 10-pound capacity for Class A, B, and C fires.

E. CONTRACTOR's and Subcontractor(s)' personnel shall refrain from smoking during excavation, backfilling, and other work at the Site which may involve potential contact with explosive vapors or gasoline products.

1.03 TEMPORARY STAIRS AND ACCESS

A. CONTRACTOR shall provide and maintain all equipment such as temporary stairs, ladders, ramps, runways, chutes, and so on as required for proper execution of the Work. CONTRACTOR shall be responsible for providing its own scaffolds, hoists, etc.

B. All such apparatus, equipment, and construction shall meet all requirements of OSHA, the labor laws, and other applicable State and local laws. Provide stairs with handrails. As soon as possible and where applicable, permanent stairs shall be installed.

C. As soon as permanent stairs are created, provide temporary protective treads, handrails, and shaft protection.

D. Provide barricades at hazardous locations, complete with signs, temporary general lighting, warning lights, and similar devices as required.

1.04 TEMPORARY SUPPORT FACILITIES

A. CONTRACTOR shall provide whatever facilities and services which may be needed to properly support primary construction process and meet compliance requirements and governing regulations.

B. CONTRACTOR shall not use permanent facilities except as otherwise indicated, unless authorized by OWNER.

1.05 REMOVAL OF TEMPORARY FACILITIES

A. Remove temporary materials, equipment, services, and construction as soon as practicable but no later than just prior to substantial completion inspection.

B. Clean and repair damage caused by installation or use of temporary facilities and restore existing facilities used during construction to specified, or to original, condition.

PART 2–PRODUCTS

NOT APPLICABLE

PART 3–EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 01560

TEMPORARY CONTROLS

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Dust Control.
   2. Water, Erosion, and Sediment Control.
   3. Noise Control.
   4. Traffic Control.
   5. Site Security.
   6. Daily Cleanup.

PART 2–PRODUCTS

NOT APPLICABLE

PART 3–EXECUTION

3.01 DUST CONTROL

A. CONTRACTOR shall execute the Work by methods to minimize raising dust from construction operations.

B. CONTRACTOR shall provide positive means to prevent airborne dust from dispersing into atmosphere.

C. CONTRACTOR shall provide partitions, enclosures, etc., within buildings as necessary to confine dust and protect adjacent areas.

3.02 WATER AND EROSION CONTROL

A. CONTRACTOR shall maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. CONTRACTOR shall protect Site from puddling or running water.

C. Erosion control measures shall comply with DNR Conservation Practice Standards-Construction Site Erosion and Sediment Controls.

3.03 NOISE CONTROL

A. Provide methods, means, and facilities to minimize noise produced by construction operations.

3.04 TRAFFIC CONTROL

A. CONTRACTOR shall be responsible for providing all signs, barricades, flagmen, and other traffic control devices in the construction zone.

B. All traffic control measures shall meet the requirements of Part 6 of the Manual on Uniform Traffic Control Devices of the State of Wisconsin.

C. Do not close or obstruct roadways without approval of OWNER.

D. Conduct operations with minimum interference to roadways.

3.05 SITE SECURITY

A. CONTRACTOR shall have the sole responsibility of safeguarding the Site perimeter to prevent unauthorized entry to the Site throughout the duration of the Project. CONTRACTOR shall at all times provide such permanent and temporary fencing or barricades or other measures as may be necessary to restrict unauthorized entry to its construction area including construction in public rights-of-way or easements. Site security measures shall include safeguards against attractive nuisance hazards as a result of construction activity.

B. CONTRACTOR shall at all times be responsible for the security of the Work including materials and equipment. OWNER will not take any responsibility for missing or damaged equipment, tools, or personal belongings. CONTRACTOR shall have the sole responsibility of safeguarding the Work and the Site throughout the duration of the Project.

3.06 DAILY CLEANUP

A. CONTRACTOR shall clean up the Site and remove all rubbish on a daily basis.

B. CONTRACTOR shall clean up public streets and remove any dirt, mud, or other materials due to project traffic on daily basis and shall comply with all local and state ordinances and permit requirements.

END OF SECTION

SECTION 01590

FIELD STORAGE AREAS AND SHEDS

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Materials, equipment, and furnishings.
   2. Construction.
   3. Environmental control.
   4. CONTRACTOR office and facilities.
   5. Storage areas and sheds.
   6. Maintenance and cleaning.
   7. Removal.

PART 2–PRODUCTS

2.01 MATERIALS, EQUIPMENT, AND FURNISHINGS

A. Materials, equipment, and furnishings shall be serviceable, new or used, and adequate for required purpose.

2.02 CONSTRUCTION

A. CONTRACTOR shall provide structurally sound, secure, weathertight enclosures for storage spaces.

B. Exterior materials shall be weather resistant.

C. Provide appropriate type fire extinguisher at each storage area.

D. Interior materials in storage sheds shall be as required to provide specified conditions for storage of products.

2.03 ENVIRONMENTAL CONTROL

A. Heating and ventilation for storage spaces shall be as needed to maintain products in accordance with Contract Documents and to provide adequate lighting for maintenance and observation of products.

2.04 CONTRACTOR OFFICE AND FACILITIES

A. CONTRACTOR shall provide facilities to meet CONTRACTOR’s needs.

2.05 STORAGE AREAS AND SHEDS

A. Provide storage areas and sheds of size to meet storage requirements for products of individual sections, allowing for access and orderly provision for maintenance and for observation of products to meet requirements of Section 01600–Materials and Equipment.

PART 3–EXECUTION

3.01 MAINTENANCE AND CLEANING

A. CONTRACTOR shall maintain approach walks free of mud, water, and snow.

3.02 REMOVAL

A. Upon final acceptance and completion of the Work, CONTRACTOR shall remove field storage and debris and shall restore areas.

END OF SECTION

SECTION 01600

MATERIALS AND EQUIPMENT

PART 1–GENERAL

1.01 SUMMARY

A. Work Included: CONTRACTOR shall be responsible for the delivery, handling, storage and protection of all material and equipment required to complete the Work as specified herein.

B. Related Sections and Divisions: Specific requirements for the handling and storage of material and equipment are described in other sections of these Specifications.

1.02 PRODUCTS

A. Components required to be supplied in quantity within a Specification section shall be the same, and shall be interchangeable.

B. CONTRACTOR shall not use materials and equipment removed from existing construction, except as specifically required, or allowed, by the Contract Documents.

C. When any construction deviations from the Drawings and/or Specifications necessary to accommodate equipment supplied by CONTRACTOR, result in additional costs to CONTRACTOR or other contractors, such additional costs shall be borne by CONTRACTOR. CONTRACTOR shall also pay any additional costs necessary for revisions of Drawings and/or Specifications by OWNER.

D. Each major component of equipment shall bear a nameplate giving the name and address of the manufacturer and the catalogue number or designation.

1.03 TRANSPORTATION AND HANDLING

A. Materials, products and equipment shall be properly containerized, packaged, boxed, and protected to prevent damage during transportation and handling.

B. CONTRACTOR shall not overload any portion of the structure in the transporting or storage of materials.

C. CONTRACTOR shall not damage other construction by careless transportation, handling, spillage, staining or impact of materials.

D. CONTRACTOR shall provide equipment and personnel to handle products, including those provided by OWNER, by methods to prevent soiling and damage.

E. CONTRACTOR shall provide additional protection during handling to prevent marring and otherwise damaging products, packaging, and surrounding surfaces.

F. CONTRACTOR shall handle product by methods to avoid bending or overstressing. Lift large and heavy components only at designated lift points.

1.04 DELIVERY AND RECEIVING

A. CONTRACTOR shall arrange deliveries of products in accordance with the Progress Schedule, allowing time for observation prior to installation.

B. CONTRACTOR shall coordinate deliveries to avoid conflict with the Work and conditions at the Site; work activities of other contractors or OWNER; limitations on storage space; availability of personnel and handling equipment and OWNER's use of premises.

C. CONTRACTOR shall deliver products in undamaged, dry condition, in original unopened containers or packaging with identifying labels intact and legible.

D. CONTRACTOR shall clearly mark partial deliveries of component parts of equipment to identify equipment and contents to permit easy accumulation of parts and to facilitate assembly.

E. Immediately on delivery, CONTRACTOR shall inspect shipment to assure:
   1. Product complies with requirements of Contract Documents and reviewed submittals.
   2. Quantities are correct.
   3. Accessories and installation hardware are correct.
   4. Containers and packages are intact and labels legible.
   5. Products are protected and undamaged.

1.05 STORAGE AND PROTECTION

A. General:
   1. CONTRACTOR shall store products, immediately on delivery, in accordance with manufacturer's instructions, with all seals and labels intact and legible.
   2. Any additional off-site storage space required shall be arranged by CONTRACTOR.
   3. CONTRACTOR shall allocate the available storage areas and coordinate their use by the trades on the job.
   4. CONTRACTOR shall arrange storage in a manner to provide access for maintenance of stored items and for observation.

B. In enclosed storage, CONTRACTOR shall:
   1. Provide suitable temporary weather tight storage facilities as may be required for materials that will be damaged by storage in the open.
   2. Maintain temperature and humidity within ranges stated in manufacturer's instructions.
   3. Provide ventilation for sensitive products as required by manufacturer's instructions.
   4. Store unpacked and loose products on shelves, in bins, or in neat groups of like items.
   5. Store solid materials such as insulation, tile, mechanical and electrical equipment, fittings, and fixtures under shelter, in original packages, away from dampness and other hazards.

C. At exterior storage, CONTRACTOR shall:
   1. Store unit materials such as conduit and poles off ground, out of reach of dirt, water, mud and splashing.
   2. Store tools or equipment that carry dirt outside.
   3. Store large equipment so as not to damage the Work or present a fire hazard.
   4. Cover products subject to discoloration or deterioration from exposure to the elements, with impervious sheet material and provide ventilation to avoid condensation.

5. Completely cover and protect any equipment or material which is prime coated or finish painted with secured plastic or cloth tarps. Store out of reach of dirt, water, mud and splashing.
6. Store loose granular materials on clean, solid surfaces such as pavement, or on rigid sheet materials, to prevent mixing with foreign matter.
7. Provide surface drainage to prevent erosion and ponding of water.
8. Prevent mixing of refuse or chemically injurious materials or liquids.
9. Cover aggregates such as sand and gravel in cold wet weather.
10. Remove all traces of piled bulk materials at completion of work and return site to original or indicated condition.

1.06 MAINTENANCE OF STORAGE

A. CONTRACTOR shall periodically inspect stored products on a scheduled basis.

B. CONTRACTOR shall verify that storage facilities comply with manufacturer's product storage requirements, and verify that manufacturer required environmental conditions are maintained continually.

C. CONTRACTOR shall verify that surfaces of products exposed to the elements are not adversely affected and that any weathering of finishes is acceptable under requirements of Contract Documents.

D. CONTRACTOR shall perform scheduled maintenance of equipment in storage as recommended by the manufacturer. A record of the maintenance shall be kept and turned over to ENGINEER when the equipment is installed.

1.07 INSTALLATION REQUIREMENTS

A. Manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned as directed by the respective manufacturers, unless otherwise specified.

B. After installation, CONTRACTOR shall protect all materials and equipment against weather, dust, moisture, and mechanical damage.

C. CONTRACTOR shall be responsible for all damages that occur in connection with the care and protection of all materials and equipment until completion and final acceptance of the Work by OWNER. Damaged material and equipment shall be immediately removed from the Site.

PART 2–PRODUCTS

NOT APPLICABLE

PART 3–EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 01650

STARTING OF SYSTEMS

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Starting equipment and systems.
   2. Demonstration and instructions.
   3. Start-up and testing.

B. CONTRACTOR shall perform the Work described in the following subsections.

1.02 STARTING EQUIPMENT AND SYSTEMS

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify OWNER a minimum of seven days prior to start-up of each item.

C. Verify that each piece of equipment or system has been checked for proper control sequence or for other conditions that may cause damage.

D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of applicable manufacturer's representative and CONTRACTOR's personnel in accordance with manufacturers' instructions.

G. Require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up and to supervise placing equipment or system in operation.

H. Equipment manufacturer shall provide a written report covering checkout, testing, inspections, and start-up and shall identify any deficiencies noted. Report shall be submitted to OWNER. CONTRACTOR shall be responsible for correcting all deficiencies noted in report.

1.03 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of products to OWNER's personnel.

B. For equipment or systems requiring seasonal operation, perform demonstration for noncurrent season at start of noncurrent season.

C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with OWNER's personnel in detail to explain all aspects of operation and maintenance.

D. Demonstrate start-up, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed time at equipment location.

E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

F. Supervision and Start-up: Installation of all equipment furnished under this Contract shall be supervised as required by a qualified representative of equipment manufacturer. All equipment shall be placed in operation by a qualified representative of the equipment manufacturer and the staff shall be trained to the satisfaction of OWNER by a qualified representative of the equipment manufacturer. OWNER may videotape training presentations given by manufacturer's representatives. Final payment for various items of equipment will not be made by OWNER until the equipment is operating to OWNER's satisfaction.

G. Where items of equipment are placed into service at different times or sequence, manufacturer's services for start-up, field testing, and supervision shall be provided for each time or sequence. Training shall be provided prior to or at the time the first similar item of equipment is placed in service.

1.04 START-UP AND TESTING

A. Prior to acceptance of any portion of the Work, start-up and testing of all equipment and testing of all materials furnished on the Project by CONTRACTOR shall have been conducted in the presence of representatives of CONTRACTOR and OWNER, and also manufacturer if requested by OWNER.

B. CONTRACTOR shall provide whatever temporary installations and conditions are necessary in order to perform start-up and testing operations on all equipment and materials furnished under the Contract. Temporary connections and equipment necessary during start-up and testing operations shall include, but not be limited to, temporary electrical equipment and devices, temporary connection from various parts of the systems and any other labor, materials, devices, or items that may be required for start-up and testing operations. Temporary conditions shall include filling with water, if necessary, to check equipment and materials.

C. All temporary installations and conditions shall be removed by CONTRACTOR upon completion of start-up and testing.

PART 2–PRODUCTS

NOT APPLICABLE

PART 3–EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Closeout procedures.
   2. Final cleaning.
   3. Adjusting.
   4. Project record documents.
   5. Warranties.
   6. Spare parts and maintenance materials.

1.02 CLOSEOUT PROCEDURES

A. CONTRACTOR shall provide submittals to OWNER that are required by governing or other authorities.

B. CONTRACTOR shall comply with General Conditions and Supplementary Conditions and complete the following before requesting OWNER's observation of the Work or designated portion thereof for substantial completion.
   1. Submit executed warranties, workmanship bonds, inspection certificates, and similar required documentation for specific units of Work, enabling OWNER's unrestricted occupancy and use.
   2. Submit record documentation, maintenance manuals, tools, spare parts, keys, and similar operational items.
   3. Submit consent of surety (if surety required in Contract).
   4. Complete final cleaning, touch-up work of marred surfaces, and remove temporary facilities and tools.

1.03 FINAL CLEANING

A. It is CONTRACTOR's responsibility to completely clean up the inside and outside of all buildings and the construction site at the completion of the Work.

B. CONTRACTOR shall clean areas of the building in which painting and finishing work is to be performed just prior to the start of this work and maintain these areas in satisfactory condition for painting and finishing. This cleaning includes:
   1. Removal of trash and rubbish from these areas.
   2. Broom cleaning of floors.
   3. Removal of any plaster, mortar, dust, and other extraneous materials from finish surfaces, including but not limited to exposed structural steel, miscellaneous metal, masonry, concrete, mechanical equipment, piping, and electrical equipment.

C. In addition to the cleaning specified above and the more specific cleaning that may be required in various technical sections of the Specifications, CONTRACTOR shall prepare the Project for occupancy by a thorough cleaning throughout, which shall include the following:
   1. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
   2. Replace filters of operating equipment.
   3. Clean debris from roofs, gutters, downspouts, and drainage systems.
   4. Clean site; sweep paved areas, rake clean landscaped surfaces.
   5. Remove waste and surplus materials, rubbish, and construction facilities from the Site.

1.04 ADJUSTING

A. CONTRACTOR shall adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 PROJECT RECORD DOCUMENTS

A. CONTRACTOR shall maintain on Site one set of the following record documents to record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. CONTRACTOR shall ensure entries are complete and accurate, enabling future reference by OWNER.

C. CONTRACTOR shall store record documents separate from documents used for construction.

D. CONTRACTOR shall record information concurrent with construction progress.

E. Specifications: CONTRACTOR shall legibly mark and record at each Product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by addenda and modifications.

F. Record Documents and Shop Drawings: CONTRACTOR shall legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of the work.
   4. Field changes of dimension and detail.
   5. Details not on original Contract drawings.

1.06 WARRANTIES

A. CONTRACTOR shall provide warranties beyond project one-year warranty as required by technical sections and as follows.

B. Submit warranty information as follows:
   1. Provide notarized copies.
   2. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers, and provide Table of Contents and assemble in three-ring binder with durable cover.
   3. Submit with request for certificate of Substantial Completion.
   4. For items of work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance listing date of acceptance as start of warranty period.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

A. CONTRACTOR shall provide spare parts, maintenance, and extra materials in quantities specified in individual specification sections.

PART 2–PRODUCTS

NOT APPLICABLE

PART 3–EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 01740

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1–GENERAL

1.01 DESCRIPTION

A. Applicable provisions of Division 1 shall govern all work under this Section.

B. This Section specifies requirements for salvaging, recycling, and disposing of construction waste.

1.02 PRECONSTRUCTION AND PREBID MEETINGS

A. The Preconstruction Conference will include discussion of the proposed Construction Waste Management Plan to develop a mutual understanding regarding details of construction waste management implementation.

1.03 WASTE MANAGEMENT GOALS

A. The recycling goal (including reuse) to be achieved at Substantial Completion of the Project shall be by 50% by weight or volume of total waste generated by the Project and includes reuse.

B. Reduce: The Project shall generate the least amount of waste and methods shall be used that minimize waste due to error, poor planning, breakage, mishandling, contamination, or similar factors. Promote the resourceful use of materials to the greatest extent possible.

C. Reuse: CONTRACTOR shall reuse materials to the greatest extent possible. Salvage reusable materials for resale, for reuse on this Project, or for storage for use on future projects. Return reusable items (e.g., pallets or unused products) to the material suppliers.

D. Recycle: As many of the waste materials not able to be eliminated in the first place or salvaged for reuse shall be recycled. Waste disposal in landfills shall be minimized to the greatest extent possible.

1.04 SUBMITTALS

A. Construction Waste Management Plan: Prior to commencing demolition or construction activities, CONTRACTOR shall develop and submit a Construction Waste Management Plan to OWNER for approval within 20 working days after Contract award or prior to any waste removal.

B. Summary of Waste Progress Reports: Throughout the duration of the Project, CONTRACTOR shall report with their periodic Applications for Payment a Summary of Waste including the quantity of each material recycled, reused, or salvaged, the receiving party and the applicable diversion rates. CONTRACTOR shall maintain a record of related weight tickets, manifests, receipts, and invoices for review by OWNER on request.

C. Summary of Waste Final Documentation: At Substantial Completion of the Project, CONTRACTOR shall submit a final summary of reuse and recycling results, including the quantity of each material recycled, reused, or salvaged, the receiving party, and the applicable diversion rates.

1.05 CONSTRUCTION WASTE MANAGEMENT PLAN

A. The purpose of the Construction Waste Management Plan is to achieve successful reuse and recycling with the highest possible reuse and recycling rates. The Plan shall include the following:
   1. A schedule identifying milestones and key reporting dates of Construction Waste Management.
   2. A list of waste materials expected to be generated from the Project as debris.
   3. A list of each material proposed to be salvaged, reused, recycled, and discarded. Identify applicable markets for reuse and/or recycling. At a minimum, all materials required by State law to be recycled shall be recycled (e.g., cardboard, cans, bottles, office paper, fluorescent bulbs, refrigerants, mercury, etc.), and scrap metal shall be recycled.
   4. Separation and Materials Handling Procedures: Description of how waste materials identified above will be separated, cleaned (if necessary), and protected from contamination.
   5. Educational and Motivational Procedures: Meetings to be held and other proposed methods for educating construction personnel regarding waste reduction and recycling.
   6. Waste Auditing Procedures: Methods of monitoring and enforcing the Plan.
   7. Documentation Procedures: Methods of documenting materials leaving the Project site as waste, for reuse, or recycling to allow Summary of Waste Progress Reports to be submitted with Applications of Payment.

B. CONTRACTOR shall distribute copies of the Construction Waste Management Plan to OWNER.

PART 2–PRODUCTS

NOT APPLICABLE

PART 3–EXECUTION

3.01 CONSTRUCTION WASTE MANAGEMENT PLAN IMPLEMENTATION

A. CONTRACTOR shall be responsible for coordinating the separation, handling, recycling, salvage, reuse, and return methods to be used by all construction personnel. CONTRACTOR shall be responsible for reporting the results of the Construction Waste Management Plan. CONTRACTOR shall designate a “Waste Manager” who is responsible for instruction construction personnel and overseeing and documenting results of the Construction Waste Management Plan.

B. Instruction: CONTRACTOR shall provide on-site instruction regarding appropriate separation, handling, recycling, salvage, reuse, and return methods to be used by all construction personnel throughout the duration of the Project.

C. Separation Facilities: CONTRACTOR shall lay out and identify a specific area on the Project site for separating materials for recycling, salvage, reuse, and return. CONTRACTOR shall provide clean waste bins and shall keep these bins and the recycling area neat, clean, and clearly marked to avoid contamination of materials.

D. Sorting: The following sorting methods are acceptable:
   1. Sorting recyclable materials at the Project site and transporting them to recycling markets directly from the Project site.
   2. Employing haulers who make use of a materials-recovery facility or a transfer station where recyclable materials are sorted from the waste and recycled before disposing of the remainder. If using a hauler or recycling facility to sort out recyclables, verify that the hauler sorts out all construction waste loads and is not limited to those that are not acceptable at the landfill. Also, verify that the hauler or recycling facility recycles at least three types of materials.

E. Hazardous Waste: Hazardous waste shall be disposed of according to State law. (Hazardous Waste is a separate category and not part of the basis on which the recycling percentage is calculated.)

F. The following resources are provided for information only, to aid CONTRACTOR in managing the Project's construction waste:
   1. The Wisconsin DNR, Bureau of Waste Management: http://www.dnr.state.wi.us/org/aw/wm/.
   2. The UW-Extension's Solid and Hazardous Waste Education Center: http://www1.uwex.edu/ces/shwec/, email shwec@uwm.edu or telephone: (608) 262-0385.
   3. WasteCap Wisconsin, Inc.: http://www.wastecapwi.org or telephone: (414) 961-1100 or (608) 245-1100.

END OF SECTION

SECTION 02050

DEMOLITION

PART 1–GENERAL

1.01 SUMMARY

A. Work Included: All demolition, removal, and salvage work as shown on the drawings or specified herein.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 SUBMITTALS

A. CONTRACTOR shall submit permits and notices, if required, authorizing building demolition.

1.03 QUALITY ASSURANCE

A. CONTRACTOR shall perform demolition, removal, and salvage in conformity with applicable federal, state, and local safety practices and code requirements.

B. CONTRACTOR shall contact all public utilities and shall shut off, cut and cap all utility services in accordance with utility requirements, codes, rules and regulations.

C. Obtain and pay for all necessary permits, licenses and certificates required.

1.04 SEQUENCE

A. No demolition, removal, or salvage work shall commence until approval to proceed has been granted by OWNER. Such work shall be completed in accordance with the construction sequence included in Division 1 of these specifications and in accordance with the construction phases of this project.

PART 2–PRODUCTS

2.01 GENERAL

A. Compacted fill shall meet the requirements of Section 02222–Excavation, Fill, Backfill and Grading.

PART 3–EXECUTION

3.01 BREAKING DOWN AND REMOVING STRUCTURES

A. General:
1. All existing structures, with all attached parts and connections, shown on the drawings or specified to be removed or that interfere with the new construction, shall be entirely removed within the limits shown or specified, unless otherwise provided.
2. When a portion of any existing structure is to be retained, CONTRACTOR shall take care during construction operations so as not to impair the value of the retained portion.
   a. Complete all operations necessary for the removal of any existing structure which might endanger the new construction prior to the construction of the new work.
   b. Do not use any equipment or devices which might damage structures, facilities, or property which are to be preserved and retained.
3. When existing reinforcing is exposed at the surface of removal areas, CONTRACTOR shall burn back the reinforcing bars 2 inches and patch with nonshrink grout, unless noted otherwise.

B. Pavement, Sidewalk, and Similar Structures:
1. Where portions of the existing structure are to be left in the surface of the finished work, CONTRACTOR shall remove the structure to an existing joint, or saw and chip the structure to a true line.
2. Sufficient removal shall be made to provide for proper grades and connections in the new work.

C. Walls, Foundations, and Similar Masonry Structures:
1. Remove entirely or break down to an elevation at least 2 feet below the earth subgrade within the areas of a road bed and elsewhere to 2 feet below the finished slopes or natural ground, as the case may be.
2. Remove existing construction as required to clear new construction.

3.02 EQUIPMENT

A. CONTRACTOR shall remove all equipment specified herein or indicated.

B. CONTRACTOR shall remove associated exposed conduit, power wiring, controls, switches, instrumentation, control wiring, control boxes, appurtenances, and their supports serving equipment to be removed. Electrical items shall be removed to their junction with motor control center, control panel, or their junction with conduit serving other equipment that is to remain.

C. CONTRACTOR shall patch floors, walls, and ceilings as required to match existing or as indicated where electrical equipment or supports are removed.

3.03 SALVAGE

A. OWNER has first right of refusal to all material, piping, and equipment removed.

B. All equipment and structures, except as specified hereinafter to be demolished shall be removed by CONTRACTOR. CONTRACTOR shall inspect each structure and determine the type and amount of equipment and materials to be removed.

C. All equipment and structures, except as specified hereinafter, within the limits of the demolition and additional items noted to be removed, will become the property of CONTRACTOR if OWNER does not claim under first right of refusal and shall be removed from the project site. Comply with State and local ordinances and regulations for disposing of materials.

3.04 BACKFILL

A. CONTRACTOR shall fill all abandoned structures and excavations resulting from removal of structures and utilities with compacted fill. See Section 02222–Excavation, Fill, Backfill, and Grading for required degree of compaction.

B. Prior to filling, CONTRACTOR shall break one opening in the floor or wall near the base of each compartment to allow groundwater to freely migrate through the structure.

END OF SECTION

SECTION 02110

SITE CLEARING AND STRIPPING

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Removal of surface debris.
   2. Removal of paving, curbs, and sidewalks.
   3. Removal of trees, shrubs, and other plant life.
   4. Strip and stockpile topsoil.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

C. Payment:
   1. Payment for site clearing and stripping will be at the unit price bid.
   2. Topsoil removal and stockpiling shall be considered unclassified excavation.

PART 2–PRODUCTS

NOT APPLICABLE

PART 3–EXECUTION

3.01 PREPARATION

A. CONTRACTOR shall identify existing plant life to remain and shall tag accordingly.

3.02 PROTECTION

A. CONTRACTOR shall protect from damage utilities and structures that are to remain.

B. See Division 1 for protection of survey monumentation.

3.03 CLEARING AND GRUBBING

A. Clearing and grubbing shall consist of cutting and disposing of trees, brush, windfalls, logs, and other vegetation, and the removing and disposing of roots, stumps, stubs, grubs, logs, and other timber from within the clearing limits as defined on the drawings, designated to be removed on the drawings or in the specifications, or fall within the excavation, embankment, or improved areas of the site.

B. All roots and stumps shall be removed to a depth of not less than 12 inches below the original ground surface in embankment areas. In cut areas, such material shall be removed to a depth of not less than 12 inches below the subgrade.

3.04 REMOVALS

A. CONTRACTOR shall remove from the site all trees, brush, and other vegetation, debris, and rocks that fall within the excavation and grading limits, as well as any paving, and sidewalks shown on the drawings to be removed.

3.05 STRIPPING

A. Excavate topsoil from areas to be built upon, cut or filled, or to have surface improvements, including roadways and walks.

B. Stockpile topsoil on-site and protect from erosion. CONTRACTOR shall provide additional topsoil as required.

C. Excess topsoil, if any, shall be removed from the site and disposed of at CONTRACTOR's expense.

END OF SECTION

SECTION 02222

EXCAVATION, FILL, BACKFILL, AND GRADING

PART 1–GENERAL

1.01 SUMMARY

A. Work Included: Excavating, filling, backfilling, and grading for this work includes, but is not necessarily limited to:
   1. Placing and compacting all fill and backfill.
   2. Placement of crushed stone mat below handholes or other structures where required.
   3. Rough and finish grading prior to seeding, etc.
   4. Excavation for foundations.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

C. Payment:
   1. General excavation shall include all excavation specified, fill, backfill and grading, including rock excavation but not including unsuitable foundation material, as hereinafter described.
   2. All general excavation shall be included in the Lump Sum Bid.

1.02 REFERENCES

A. ASTM D1557–Test Methods for Moisture Density Relations of Soils and Soil–Aggregate Mixtures using 10-pound Rammer and 18-inch drop.

B. Standard Specifications: Unless otherwise indicated, Standard Specifications within this section shall refer to the State of Wisconsin Department of Transportation, Standard Specifications for Highway and Structure Construction, current edition, including all issued supplemental specifications.

1.03 SUBMITTALS

A. CONTRACTOR shall submit samples of materials proposed for use as fill to soils testing laboratory for analysis of their suitability and for recommendations on moisture content during compaction, compaction methods, or other appropriate information.

B. CONTRACTOR shall submit sufficient samples of each different type or classification of soil to obtain representative values.

1.04 JOB CONDITIONS

A. No soil borings were made for this project. CONTRACTOR shall conduct its own investigation to determine physical conditions at the site which may affect the work.

PART 2–PRODUCTS

2.01 COMPACTED FILL

A. All fill and backfill material designated to be compacted fill shall be granular with no stones larger than 4 inches and shall be reasonably well-graded throughout the particle size range. Of that portion of the material passing the No. 4 sieve, not more than 25% shall pass the No. 200 sieve, and material shall have less than 5% clay content. When placing fill during wet weather or in wet areas, this requirement shall be modified to not more than 5% passing the No. 200 sieve. Adequately dewatered areas are not defined as wet areas.

B. Native material may be used as compacted fill if it meets the above specification. CONTRACTOR shall determine whether native material meets the above specification. CONTRACTOR shall provide all needed fill material whether from on-site or off-site at no additional cost to OWNER.

2.02 CRUSHED STONE MAT

A. Crushed stone mat below handholes shall be 3/4-inch clear crushed stone and shall meet all requirements of ASTM C33 size No. 67.

2.03 CLAY FILL

A. Clay fill shall contain at least 25% clay minerals (material finer than 0.002 mm).

PART 3–EXECUTION

3.01 GENERAL

A. Prior to all excavating, CONTRACTOR shall become thoroughly familiar with the site and site conditions.

3.02 PROTECTION

A. CONTRACTOR shall provide all necessary sheeting, shoring, or other soil retention systems including all labor, material, equipment, and tools required, or as necessary to maintain the excavation in a condition to provide safe working conditions, to permit the safe and efficient installation of all items of Contract work, and to protect adjacent property. CONTRACTOR shall be held liable for any damage which may result to property from excavation or construction operations. Sheeting, shoring, and other soil retainage systems shall be withdrawn or removed in a manner so as to prevent subsequent settlement of structures, utilities, and other improvements.

B. Nothing in this specification shall be deemed to allow the use of protective systems less effective than those required by the Occupational Safety and Health Administration (OSHA) and other applicable code requirements.

3.03 UTILITIES

A. Before starting excavations, CONTRACTOR shall locate existing underground utilities in all areas of the work.

B. If utilities are to remain in place, CONTRACTOR shall provide adequate means of protection during earthwork operations.

C. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult utility owner immediately for directions.

D. Cooperate with OWNER and utility companies in keeping respective services and facilities in operation, and repair any damaged utilities to satisfaction of utility owner.

E. CONTRACTOR shall not interrupt existing utilities serving facilities occupied and used by OWNER or others except when permitted in writing by OWNER.

3.04 FINISH ELEVATIONS AND LINES

A. CONTRACTOR is responsible for setting and establishing finish elevations and lines.

3.05 EXCAVATION

A. After the site has been cleared and stripped, the site shall be cut and filled to the indicated subgrade as shown or specified.

B. All excavated material that does not meet the specification for compacted fill or meets the specification but is not required for backfill shall be classified as excess material and shall be removed from the site and disposed of at CONTRACTOR's expense.

C. CONTRACTOR shall backfill and compact all overexcavated areas.

D. Excavations for all foundation work shall be large enough to provide adequate clearance for proper execution of the work within them.

3.06 PREPARATION OF SUBGRADE

A. After the site has been cleared, stripped, and excavated to subgrade, thoroughly compact subgrade to the requirements specified for compacted fill below. Scarify and moisture condition the subgrade as recommended by the Project Soils Engineer.

B. Remove all ruts, hummocks, and other uneven surfaces by surface grading prior to placement of fill.

C. All sidewalk and pavement subgrades shall be compacted as specified.

3.07 COMPACTED FILL AND BACKFILL

A. All fill and backfill, except as otherwise specified, shall be compacted fill placed to within 4 inches of the bottom of the topsoil or to the bottom of the structure or other improvement.

B. No fill shall be placed under water or over unsuitable subgrade conditions.

C. All fill and backfill, except embankment fill and clay fill, shall be compacted as follows:
   1. Class 1 Compaction: This class of compaction shall apply to all backfill within 10 feet of structure walls. All compacted material shall be placed in uniform layers not exceeding 8 inches in loose thickness prior to compaction. Each layer shall be

uniformly compacted to a dry density at least 95% of the maximum dry density as determined by a laboratory compaction test at the optimum moisture content (ASTM Test Designation D1557). Compaction shall be obtained by compaction equipment appropriate for the conditions.

2. Class 2 Compaction: This class of compaction shall be used in excavated areas beyond 10 feet of structures without any piping or adjacent foundations. Material for backfill shall be granular material as specified above. The material shall be deposited, spread, and leveled in layers generally not exceeding 12 inches in thickness before compaction. Each layer of the fill shall be compacted to at least 90% of the maximum dry density (testing same as Class 1). Compaction shall be obtained by compaction equipment appropriate for the conditions.

D. No frozen material shall be placed nor shall any material be placed on frozen ground.

E. Four inches of clay fill shall be placed and compacted to at least a firm consistency in areas to be seeded or sodded prior to placement of topsoil.

3.08 EMBANKMENT FILL

A. Embankment fill may be placed in fill areas to be seeded or sodded if no piping exists in the fill and the areas are at least 10 feet from any structure.

B. Embankment fill shall be deposited, spread, and leveled in layers generally not exceeding 12 inches in thickness before compaction. Each layer shall be compacted to the degree that no further appreciable consolidation is evidenced under the action of the compaction equipment. The required compaction shall be obtained for each layer before any material for a succeeding layer is placed thereon. Compaction shall be obtained using the hauling and leveling equipment, and in addition, tamping rollers, pneumatic-tired rollers, vibratory rollers, or other types of equipment required to produce the desired results.

3.09 GRADING

A. CONTRACTOR shall perform all rough and finish grading required to match the existing elevations.

3.10 PLACING CRUSHED STONE AND GEOTEXTILE FABRIC

A. The same day that the subgrade is exposed, place geotextile fabric on subgrade, and place 12 inches of crushed stone mat below handholes. Compact in place.

3.11 COMPACTION TESTING

A. Compaction tests shall be done by the Project Soils Engineer. Location and frequency of the tests shall be as recommended by the Project Soils Engineer and paid for by OWNER.

END OF SECTION

SECTION 02231

AGGREGATE BASE COURSE

PART 1–GENERAL

1.01 SUMMARY

A. Work Included: Aggregate base course for roads and parking areas.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

C. Repair or replacement of aggregate base course shall be considered incidental and included in the price bid.

D. CONTRACTOR is cautioned that existing private and public roads and shoulders may not hold up to typical construction traffic or activities. CONTRACTOR shall repair all roads, shoulders, and gravel areas damaged in accordance with this section. All paved areas shall also be repaired in accordance with Section 02510–Asphaltic Concrete Paving.

1.02 REFERENCES

A. Standard Specifications: Unless otherwise indicated, Standard Specifications shall refer to the State of Wisconsin Department of Transportation, Standard Specifications for Highway and Structure Construction, current edition, including all issued supplemental specifications.

1.03 DEFINITIONS

A. Street or road shall include streets, roads, driveways, and parking lots.

1.04 SUBMITTALS

A. Submit sieve analysis for proposed materials in accordance with Section 01300-Submittals.

1.05 DRAINAGE DURING CONSTRUCTION

A. CONTRACTOR shall comply with the provisions of Section 205.3.3 of the Standard Specifications.

PART 2–PRODUCTS

2.01 AGGREGATES

A. Aggregate for base course shall meet the requirements of Sections 301 and 305 of the Standard Specifications.

B. Base course shall be uniformly graded and shall conform to the requirements of Base Aggregate Dense, 1 1/4 inch.

C. Material for top layer of shoulders shall meet the requirements of Base Aggregate Dense, 3/4 inch.

PART 3–EXECUTION

3.01 PREPARATION

A. The subgrade shall be graded and rolled to provide uniform density and shall comply with the profile and cross sections contained in the drawings. All street subgrade in cut areas and all areas to receive fill shall be proof-rolled in the presence of OWNER or ENGINEER with a heavily loaded triaxle dump truck or similar equipment prior to the placement of any fill materials or base course. The subgrade shall be prepared in accordance with Section 211 of the Standard Specifications.

3.02 CONSTRUCTION

A. Base course grade shall be set to allow placement of thickness of asphaltic pavement shown or specified.

B. Depth of base course shall be provided according to the standard cross sections provided on the drawings.

C. Depth of base course shall be the existing depth or 9 inches, whichever is greater.

D. Each layer of base course shall be wetted and rolled to provide maximum compaction in accordance with Section 305 of the Standard Specifications.

E. The finished base course shall be fine graded in preparation for paving.

F. After final grading, CONTRACTOR shall maintain the base course until asphaltic paving work has been completed.

G. All gravel surfaces damaged during construction shall be replaced. The depth of aggregate shall match existing or 8 inches, whichever is greater.

END OF SECTION

SECTION 02270

SLOPE PROTECTION AND EROSION CONTROL

PART 1–GENERAL

1.01 SUMMARY

A. Work Included: Erosion control devices.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 PAYMENT

A. All costs associated with slope protection and erosion control shall be included in CONTRACTOR's Bid. This work shall include, but is not limited to, excavation, backfilling, attaching woven wire and geotextile fabric; installing sediment traps; cleaning and repairing; removing or spreading accumulated sediment to form a surface suitable for seeding; and furnishing labor, tools, equipment, and incidentals necessary to complete the work in accordance with the Contract.

1.03 REFERENCES

A. Wisconsin Department of Natural Resources Conservation Practice Standards-Construction Site Erosion and Sediment Control (Conservation Practice Standards).

B. Erosion Control Product Applicability List for Multi-Modal Applications (PAL) Wisconsin Department of Transportation.

C. Dane County Erosion Control and Stormwater Management Manual (www.co.dane.wi.us/landconservation/ecswpg.htm).

1.04 REGULATORY REQUIREMENTS

A. CONTRACTOR shall maintain site conditions where erosion and pollution are controlled.

1.05 QUALITY CONTROL

A. Construct and maintain erosion sediment control measures in accordance with the Conservation Practice Standards.

B. Check facilities weekly and after any rainfall event, and make needed repairs within 24 hours.

PART 2–PRODUCTS

2.01 EROSION CONTROL PRODUCTS

A. Erosion control products shall be as listed in the *Erosion Control Product Acceptability List for Multi-Modal Applications (PAL)* of the Wisconsin Department of Transportation. Contractors may obtain copies of the PAL and PAL qualification procedures from the WisDOT Bureau of Highway Construction.

2.02 INLET PROTECTION

A. Inlet protection shall conform to Conservation Practice Standard 1060-Storm Drain Inlet Protection for Construction Sites. Manufactured bags shall conform to Table 1 of Conservation Practice Standard 1060.

PART 3–EXECUTION

3.01 GENERAL

A. Install devices before construction activities begin.

B. Expose the smallest practical area of soil at any given time through construction scheduling. Make the duration of such exposure before application of temporary erosion control measures or final revegetation as short as practicable.

C. CONTRACTOR shall provide a “qualified” inspector to inspect erosion control and sediment controls once in place. Inspector shall have prior experience with and knowledge of installation and maintenance of erosion and pollution controls. Unless stricter requirements are mandated by DNR or by any local permits, project site erosion control inspection shall be conducted every seven days and after each one-half-inch rainfall or greater. CONTRACTOR shall maintain hard copies of the inspection reports for the duration of the Project.

D. Any necessary repairs to erosion and sediment control facilities shall be provided within 24 hours to all corrective measures noted on the inspection reports to address pollution issues. CONTRACTOR shall submit to OWNER a written notice stating the times, dates and actions taken to rectify the defective erosion and sediment controls.

E. CONTRACTOR shall also make any necessary additions for erosion and sediment control as may result from on-site conditions or the progress of the Work or as may be required by DNR or OWNER.

F. Disturbed areas shall be stabilized with temporary or permanent measures within 14 calendar days of the soil disturbance or redisturbance.

G. All temporary erosion and sediment control measures shall be removed within 30 days after final stabilization is achieved or after the temporary measures are no longer needed. All sediment accumulated in temporary and permanent facilities shall be removed and properly disposed of and the area restored.

3.02 INLET PROTECTION

A. All storm drains that are or will be functioning during construction shall be provided with inlet protection. Inlet protection shall be provided in conformance with the criteria specified in Conservation Practice Standard 1060–Storm Drain Inlet Protection for Construction Sites.

END OF SECTION

SECTION 02510

HOT MIX ASPHALT PAVING

PART 1–GENERAL

1.01 SUMMARY

A. Work includes Hot Mix Asphalt (HMA) paving, tack coat, and casting adjustments.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

C. CONTRACTOR is cautioned that existing private and public roads and shoulders may not hold up to typical construction traffic or activities. CONTRACTOR shall replace all roads, shoulders, and paved areas damaged during the project in accordance with this section. Gravel shoulders, gravel roads, and parking areas shall be repaired in accordance with Section 02231–Aggregate Base Course.

D. Payment: Payment for HMA paving shall be considered incidental to the project and included in the Lump Sum Bid.

1.02 REFERENCES

A. Standard Specifications: Unless otherwise indicated, Standard Specifications shall refer to the State of Wisconsin Department of Transportation, Standard Specifications for Highway and Structure Construction, current edition, including all issued supplemental specifications.

1.03 DEFINITIONS

A. Street or road shall include streets, roads, driveways, and parking lots.

1.04 SUBMITTALS

A. Prior to the commencement of paving, mix designs and aggregate sieve analysis shall be submitted to ENGINEER for approval in accordance with Section 01300–Submittals.

PART 2–PRODUCTS

2.01 HMA PAVEMENT

A. Asphaltic pavement shall be HMA Pavement Type E-0.3. Asphaltic material for lower layer and upper layer shall be asphaltic material PG58-28.

B. Aggregate shall conform to the requirements of Section 460.2.2 of the Standard Specifications. Aggregate for the lower layer shall be nominal size of 19.0 mm. Aggregate for the upper layer shall be nominal size of 12.5 mm.

C. Where existing pavement is replaced, minimum pavement thickness shall be 4 inches or existing thickness, whichever is greater. Lower layer shall be 2 1/4 inches minimum. Upper layer shall be 1 3/4 inches minimum.

D. Materials for tack coat shall conform to the requirements of Section 455.2.5 and shall be MS-2, SS-1, SS-1h, CSS-1 or CSS-1h.

PART 3–EXECUTION

3.01 ALLOWABLE REMOVAL OF PAVEMENT

A. CONTRACTOR shall remove asphalt pavement and road surface as a part of the general excavation. The width of pavement removed shall be the minimum possible and acceptable for convenient and safe installation of structures, utilities, and appurtenances.

B. All asphalt pavement shall be cut on neat, straight lines and shall not be damaged beyond the limits of the excavation. Should the cut edge be damaged, a new cut shall be made in neat, straight lines parallel to the original cut encompassing all damaged areas. Pavement removal shall be extended to a seam or joint if seam or joint is within 3 feet of damaged pavement.

3.02 TACK COAT

A. All work shall be in accordance with the Standard Specifications.

B. If asphaltic upper layer is applied to an existing street or is not applied the same day as lower layer, the existing street or lower layer shall be tack coated prior to surface paving. Prior to placement of tack coat, the streets shall be thoroughly cleaned and broomed. Tack coat shall be applied at a rate of 0.10 gallons per square yard immediately prior to placement of asphaltic upper layer.

C. In situations where traffic must be maintained, tack coat shall not be placed on the traveled half of the street until traffic can be switched to the new pavement.

3.03 JOINTS

A. Joints between old and new pavements or between successive day’s work shall be constructed and treated as to ensure thorough and continuous bond between the old and new mixtures. Transverse construction joints shall be constructed by cutting the material back for its full depth so as to expose the full depth of the course. Where a header is used, the cutting may be omitted provided the joint conforms to the specified thickness. These joints shall be treated with tack coat material applied with a hose and spray nozzle attachment to fully coat the joint surface.

B. The longitudinal joint shall be made by overlapping the screed on the previously laid material for a width of not more than 2 inches and depositing a sufficient amount of asphaltic mixture so that the finished joint will be smooth and tight. Longitudinal joints in the upper layer shall at no time be placed immediately over similar joints in the lower layer beneath. A minimum distance of 12 inches shall be permitted between the location of the joints in the lower layer and the location of similar joints in the upper layer above.

C. All costs for furnishing and applying tack coat to butt joints as specified above shall be considered incidental.

3.04 FINISHING ROADWAY

A. The finished base course shall be fine-graded in preparation for HMA paving. Base course ramps at all existing pavement shall be removed to provide a full depth butt joint. Base course around manhole castings and valve boxes shall be hand-trimmed and compacted with a vibratory plate compactor.

B. This item shall include all of the following preparatory and finishing items and any other incidental items of work required for construction. Asphaltic ramps around manholes on existing lower layer to receive upper layer shall be removed. Asphaltic ramps shall be installed on all manholes and at all butt joints in areas to receive lower layer only.

C. Finishing roadway shall be considered incidental to HMA paving.

3.05 TESTING HOT MIX ASPHALT

A. ENGINEER may require samples of HMA pavement for testing. CONTRACTOR shall cut samples from the finished pavement where marked by ENGINEER and patch the sample area. Samples for sieve analysis and asphalt content will be taken by ENGINEER prior to placement.

3.06 HOT MIX ASPHALT PAVING

A. HMA paving work shall include the construction of plant-mixed hot mix asphalt pavement in the areas shown on the drawings. All work shall be performed in accordance with Section 460 of the Standard Specifications.

B. Prior to commencement of paving operations, CONTRACTOR shall examine the finished road bed. CONTRACTOR shall notify ENGINEER of any areas of suspected instability.

C. The pavement structure for new roads shall match existing.

END OF SECTION

SECTION 02521

CONCRETE SIDEWALKS

PART 1–GENERAL

1.01 SUMMARY

A. Work includes concrete sidewalks as shown on the drawings.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 REFERENCES

A. Standard Specifications: Unless otherwise indicated, Standard Specifications shall refer to the State of Wisconsin Department of Transportation, Standard Specifications for Highway and Structure Construction, current edition, including all issued supplemental specifications.

B. AASHTO M148 Standard Specifications for Liquid Membrane–Forming Compounds for Curing Concrete.

1.03 QUALITY ASSURANCE

A. Unless otherwise specified, all sidewalk construction shall meet the requirements of the Standard Specifications.

PART 2–PRODUCTS

2.01 CONCRETE

A. All concrete shall conform to Section 501 of the Standard Specifications for Grade A air-entrained concrete.

2.02 CURING COMPOUND

A. Liquid curing compounds shall conform to the requirements of the Standard Specifications for Liquid Membrane-Forming Compounds for Curing Concrete, AASHTO Designation M148, Type 2, White Pigmented.

PART 3–EXECUTION

3.01 BASE PREPARATION–SIDEWALKS

A. The subgrade shall be thoroughly compacted and finished to a trim, firm surface. All soft or unsuitable material shall be removed and replaced with suitable material.

B. A minimum 2-inch-thick layer of sand, sand and gravel, or base course shall be placed under all sidewalks. This material shall be thoroughly moistened and compacted before the concrete is placed.

3.02 FORMS

A. Forms shall be of metal and of sufficient strength to resist distortion or displacement. Forms shall be full depth of the required work. Facing boards, if used, shall be built so as to obtain the cross section called for on the drawings. Forms shall be securely staked and held firmly to line and grade. Forms shall be cleaned thoroughly and oiled before reuse.

3.03 PLACING AND FINISHING CONCRETE

A. Unless otherwise specified, concrete shall be placed in accordance with the Standard Specifications.

B. Concrete for sidewalk shall be placed to a minimum thickness of 5 inches, except at driveways and alleys, which shall have a minimum thickness equal to that of the driveway. The concrete shall be thoroughly spaded and tamped to remove all voids. The surface of the sidewalk shall be thoroughly troweled and finished with a brush at right angles to the sidewalk line.

3.04 JOINTING–SIDEWALKS AND DRIVEWAYS

A. Concrete sidewalk shall be cut into rectangular blocks approximately 5 feet long. The cut must extend at least one-fifth of the total thickness of concrete. The edges of the sidewalk along forms and joints shall be rounded with an edging tool of 1/4-inch radius. All joints shall be at right angles to the centerline of the sidewalk.

3.05 EXPANSION JOINTS

A. A 3/4-inch-thick expansion joint shall be placed at all sidewalk corners and between sidewalks and foundations.

3.06 SLOPE

A. Sidewalk cross slope shall match existing sidewalk cross slope unless otherwise noted in the drawings or requested by ENGINEER.

3.07 CURING

A. As soon after finishing operations as the free water has disappeared, the concrete surface shall be sealed by spraying on it a uniform coating of curing material in such a manner as to provide a continuous water impermeable film on the entire concrete surface.

B. The material shall be applied to form a uniform coverage at the rate of not less than one-half gallon per 100 square feet of surface area.

C. Within 30 minutes after the forms have been removed, the edges of the concrete shall be coated with the curing compound applied at the same rate as on the finished surface.

3.08 PROTECTION OF CONCRETE

A. CONTRACTOR shall erect and maintain suitable barricades to protect the new concrete. Where it is necessary to provide for pedestrian traffic, CONTRACTOR shall, at his own cost, construct adequate crossings. Crossing construction shall be such that no load is transmitted to the new concrete.

B. Any part of the work damaged or vandalized prior to final acceptance shall be repaired or replaced at the expense of CONTRACTOR in a manner satisfactory to ENGINEER.

C. Pedestrian traffic shall not be permitted over new concrete prior to 72 hours after application of curing material. Vehicular traffic shall not be permitted over newly placed concrete within 7 days after completion when temperatures are 70°F or higher, 10 days when temperatures are not lower than 60°F and up to a maximum of 21 days when the temperatures are generally lower than 60°F.

END OF SECTION

SECTION 02930

RESTORATION

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Placement of topsoil.
   2. Fertilizing.
   3. Seeding.
   4. Mulching.
   5. Maintenance.

B. All areas disturbed by construction shall be restored.

C. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

D. Payment: Payment for restoration shall be at the lump sum price bid. Costs for topsoiling, seeding, fertilizer, mulching, and maintenance of restored areas shall be included in the lump sum price bid. One percent of the total Contract price shall be retained following project completion until a uniform 2-inch growth of vegetation is established over all restored areas. CONTRACTOR shall be responsible to make his own computations for area restoration.

1.02 REFERENCES

A. Standard Specifications: Unless otherwise indicated, Standard Specifications shall refer to the State of Wisconsin Department of Transportation, Standard Specifications for Highway and Structure Construction, current edition, including all issued supplemental specifications.

1.03 QUALITY ASSURANCE

A. All work shall be in accordance with Standard Specifications, unless noted otherwise.

PART 2–PRODUCTS

2.01 TOPSOIL

A. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, stones greater than 3/4 inches in size, clay or impurities, plants, weeds and roots; pH value of minimum 5.4 and maximum 7.0.

B. Topsoil from the site may be used if it meets the above requirements.

2.02 SEED

A. Seeding shall comply with Section 02936-Seeding and Sodding.

2.03 FERTILIZER

A. Fertilizer shall be Type B per Section 629 of the Standard Specifications.

PART 3–EXECUTION

3.01 TOPSOIL

A. Placing topsoil shall be in accordance with Section 625.3.3 of the Standard Specifications. Topsoil shall be placed to a uniform depth of 6 inches in place. Topsoil placement shall be incidental to sodding or seed and fertilizer.

3.02 SEEDING

A. Seeding shall comply with Section 02936-Seeding and Sodding.

3.03 FERTILIZER

A. Fertilizer shall be applied per Section 629 of the Standard Specifications.

END OF SECTION

SECTION 02936

SEEDING AND SODDING

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Preparation of subsoil.
   2. Placing topsoil.
   3. Seeding, sodding, mulching and fertilizing.
   4. Maintenance.

B. All areas of the site which are disturbed and areas noted on the drawings shall be seeded or sodded. Surfaces on 3-to-1 slope or less may either be seeded or sodded, but surfaces on greater than 3-to-1 slope shall be sodded.

C. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 REFERENCES

A. FS O-F-241–Fertilizers, Mixed, Commercial.

B. Standard Specifications: Unless otherwise indicated, Standard Specifications shall refer to the State of Wisconsin Department of Transportation, Standard Specifications for Highway and Structure Construction, current edition, including all issued supplemental specifications.

1.03 QUALITY ASSURANCE

A. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.

B. Sod: Minimum age of 18 months, with root development that will support its own weight without tearing when suspended vertically by holding the upper two corners. Submit sod certification for grass species and location of sod source.

1.04 DELIVERY, STORAGE, AND PROTECTION

A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

B. Deliver sod on pallets or in rolls. Protect exposed roots from dehydration. Do not deliver more sod than can be laid within 24 hours.

C. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

PART 2–PRODUCTS

2.01 SEED MIXTURE

A. Seed mix shall be coordinated with OWNER to match the existing seeding. Use blue tag certified seed. Do NOT use bent or Poa Annua. Each seed lot will be subject to sampling and testing by the State seed laboratory.

B. Weed content shall not exceed 0.5% in mixture.

2.02 SOD

A. Follow Section 631.1.2.1 of the Standard Specifications.

B. Netting or fabric for sod reinforcement shall be in accordance with Section 631.2.2 of the Standard Specifications.

C. Anchorage staples shall be in accordance with Section 631.12.3 of the Standard Specifications.

2.03 SOIL MATERIALS

A. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay, or impurities, plants, weeds, roots and rocks; pH value of minimum 5.4 and maximum 7.0.

B. Topsoil from the site may be used if it meets the above requirements. Additional topsoil shall be provided as required by drawings and specifications.

2.04 ACCESSORIES

A. Mulching material shall be oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.

B. Fertilizer shall be FS O-F-241, Type I, Grade A; recommended for grass, with 50% of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil to the following proportions: Nitrogen 10%, phosphoric acid 10%, soluble potash 10%. Submit composition deviations to suit site conditions for ENGINEER's approval.

C. Water shall be clean, fresh, and free of substances or matter which could inhibit vigorous growth of grass.

PART 3–EXECUTION

3.01 EXAMINATION

A. Verify that prepared soil base is ready to receive the work of this section.

3.02 PREPARATION OF SUBSOIL

A. Prepare subsoil to eliminate uneven areas and low spots. Maintain lines, levels, profiles, and contours. Make changes in grade gradual. Blend slopes into level areas.

B. Remove foreign materials, weeds, and undesirable plants and their roots. Remove contaminated subsoil in accordance with local, state, and federal regulations.

C. Scarify subsoil to a depth of 3 inches where topsoil is to be placed. Repeat cultivation in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

3.03 PLACING TOPSOIL

A. Spread topsoil to a minimum depth of 4 inches over area to be seeded. Rake until smooth.

B. Place topsoil during dry weather and on dry unfrozen subgrade.

C. Remove vegetable matter and foreign nonorganic material from topsoil while spreading.

D. Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.

E. Manually spread topsoil around pole bases and buildings to prevent damage.

F. Leave stockpile area and site clean and raked, ready to receive landscaping.

3.04 FERTILIZING

A. Apply fertilizer at a rate of 17 pounds per 1,000 square feet.

B. Apply after smooth raking of topsoil and prior to installation of seed or sod, no more than 18 hours before seeding or 48 hours before sodding.

C. Do not apply fertilizer at same time or with same machine as will be used to apply seed.

D. Mix thoroughly into upper 2 inches of topsoil.

E. Lightly water to aid the dissipation of fertilizer.

3.05 SEEDING

A. Apply seed at a total rate of 3 1/2 pounds per 1,000 square feet. Apply evenly in two intersecting directions. Rake in lightly or roll the seeded area after seeding.

B. Do not seed areas in excess of that which can be mulched on same day.

C. Planting season shall be between April 15 and June 15, or between August 15 and October 15.

D. Do not sow immediately following rain, when ground is too dry or during windy periods.

E. Immediately following seeding, apply mulch:
   1. Minimum Spread Rate: 1 1/2 tons per acre.

2. Maximum Depth: 1 1/2 inches to 2 inches.

F. Apply water with a fine spray immediately after each area has been mulched and on a daily basis to keep straw in place.

G. Seeding shall be maintained by CONTRACTOR until grass is well established. Grass is well established when it covers the entire seeded areas to a height of 2 inches.

3.06 LAYING SOD

A. Moisten prepared surface immediately prior to laying sod.

B. Lay sod immediately after delivery to site to prevent deterioration.

C. Lay sod tight with no open joints visible and no overlapping; stagger end joints 12 inches minimum. Do not stretch or overlap sod pieces.

D. Lay smooth. Align with adjoining grass areas.

E. Place bottom elevation of sod 1 inch below top of adjoining edging, paving, or curbs.

F. All sod placed in ditches, flumes, or other appurtenances where a concentrated flow of water may be expected shall be staked regardless of the slope.

G. Water sodded areas immediately after installation. Saturate sod to 4-inch depth of soil.

3.07 MAINTENANCE

A. Water to prevent grass and soil from drying out.

B. Roll surface to remove minor depressions or irregularities.

C. Control growth of weeds. Apply herbicides in accordance with manufacturer’s instructions. Remedy damage resulting from improper use of herbicides.

D. Immediately reseed areas which fail to show adequate catch. Bare spots shall not exceed 5 square feet in area and not exceed 3% of the total seeded areas. Immediately replace sod in areas which show bare spots or deterioration.

E. Protect seeded areas with warning signs during maintenance period.

F. Immediately reseed areas which do not show a satisfactory stand of established grass, and resod areas that do not show satisfactory establishment.

G. Correct damage resulting from erosion, gullies, rills, or other causes by filling with topsoil, tamping, refertilizing, and reseeding if damage occurs prior to acceptance of work.

H. Maintain seeded lawns for not less than 60 days after substantial completion.

I. If seeded in fall and not given full 60 days of maintenance, or if not considered acceptable at that time, continue maintenance the following spring until acceptable lawn is established.

J. Maintain sodded lawns for not less than 30 days after substantial completion.

K. Maintain lawns by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regrading, and replanting as required to establish a smooth acceptable lawn free of eroded or bare areas.

END OF SECTION

SECTION 03100

CONCRETE FORMWORK

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Forms for cast-in-place concrete.
   2. Form accessories.
   3. Openings for other work.
   4. Form stripping.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

C. Unit Price: CONTRACTOR shall fill in a unit price for “Forming” in the blank space provided in the Bid to apply in the event of any deductions from or additions to the work. The unit prices shall include all elements of work specified in this section.

1.02 REFERENCES

A. ACI 301–Structural Concrete for Buildings.

B. ACI 318–Building Code Requirements for Reinforced Concrete.

C. ACI 347–Recommended Practice for Concrete Formwork.

D. PS1–Construction and Industrial Plywood.

1.03 DESIGN

A. All formwork shall comply with ACI 347 and ACI 301.

B. CONTRACTOR shall assume the responsibility for the complete design and construction of the formwork.

1.04 SUBMITTALS

A. Submit shop drawings in accordance with Section 01300–Submittals for form ties, form coatings, form liners (if any), and any other form accessories.

PART 2–PRODUCTS

2.01 FORMS

A. Forms shall be of wood, plywood, steel, fiberboard lined, or other approved materials which will produce concrete which meets the specified requirements. The type, size,

quality, and shape of all materials of which the forms are made are subject to the review of ENGINEER.

B. Caution shall be exercised in the use of wood or composition forms or form liner to be certain that no chemical reaction will take place which causes a damaging effect on the concrete surface.

2.02 FORM TIES–NONREMOVABLE

A. Internal wall ties shall contain positive stops at the required wall thickness. The exterior clamp portions of the tie shall be adjustable in length. Ties shall have cones on the water side of water-containing structures. Ties shall also have cones on the exterior side of all structures which have PVC water-stopped construction joints. Ties shall provide a positive disconnection on both ends 1 to 1 1/2 inches inside the finished face of the concrete.

B. All wall ties used in the placement of structures which have PVC or hydrophilic water-stopped construction joints shall contain integral waterstops. All such ties shall be crimped or deformed in such a manner that the bond between concrete and tie cannot be broken in removal of the outer units. This portion of the tie shall not be removed prior to 24 hours after completion of the concrete placement.

C. The use of wood spacers and wire ties will not be approved.

2.03 FORM TIES–REMOVABLE

A. Taper ties which are designed to be removed entirely from the wall may be used with forms designed for this tie type and spacing.

B. Tie holes shall be plugged with a neoprene plug, Dayton Superior, Inc., Sure-Plug, or equal.

C. Cementitious waterproofing for patching taper tie holes shall be Hey Di K-11, Xypex Patch-N-Plug, or equal.

2.04 FORM COATINGS

A. Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces requiring bond or adhesion, nor impede the wetting of surfaces to be cured with water or curing compounds.

2.05 CHAMFER STRIPS

A. Provide 3/4-inch by 3/4-inch wood or plastic chamfer strips at all exposed corners, except as noted.

2.06 KEYWAYS

A. Keyways shall be formed with wood inserts.

PART 3–EXECUTION

3.01 CONSTRUCTION

A. Forms shall conform to the shape, line, grade, and dimensions as shown on the drawings. They shall be mortar-tight and sufficiently rigid to prevent displacement or sagging between supports and shall support the loads and pressures without deflection from the prescribed lines. They shall be properly braced or tied together so as to maintain position and shape and insure safety to workmen and passersby. Spacing of ties shall be recommended by the tie manufacturer.

B. Formwork shall be constructed to meet the tolerances and intentions specified below for the indicated applications:
   1. Flat surfaces shall be formed in accordance with tolerances indicated in ACI 347 for buildings.
   2. Curved surfaces shall also meet ACI 347 for buildings. All exposed curved surfaces shall be formed to the continuous surface of the radius specified. Where segmented forms are proposed, a form system which deviates more than 3/8 inches from a circle through pan edges will not be allowed.
   3. Architectural surfaces and surfaces to be fitted with equipment shall be formed to match the shape intended. Where indicated on the drawings, the form shall be lined with minimum 3/8-inch masonite and shimmed as required.
   4. Variation from plumb shall not exceed 1/4 inch in 10 feet, and variation in linear lines shall not exceed 1/2 inch in 20 feet. These and other tolerance specified in ACI-347 shall be considered a part of this specification.

C. When forms are placed for successive concrete placement, thoroughly clean concrete surfaces, remove fins and laitance, and tighten forms to close all joints. Align and secure joints to avoid offsets.

D. At the request of ENGINEER, temporary openings shall be provided at the base of column forms and wall forms and at other points where necessary to facilitate cleaning and observation immediately before depositing concrete.

E. Provide inserts and provide openings in concrete form work to accommodate work of other trades. Verify size and location of openings, recesses, and chases with the trade requiring such items. Securely support items to be built into forms.

F. Provide top forms for inclined surfaces where the slope is too steep to place and vibrate concrete.

G. Bevel wood inserts for forming keyways (except in expansion joints where inserts shall have square edges), reglets, recesses, and the like to assure ease of removal. Inserts shall be securely held in place prior to concrete placement. Unless otherwise shown, chamfer strips shall be placed in the angles of the forms to provide 3/4-inch bevels at exterior edges and corners of all exposed concrete.

H. The forms shall be oiled with a field-applied commercial form oil or a factory-applied nonabsorptive liner. Oil shall not stain or impede the wetting of surfaces to be cured with water or curing compounds. The forms shall be coated prior to placing reinforcing steel. Oil on reinforcement will not be permitted.

I. All form surfaces shall be thoroughly cleaned, patched, and repaired before reusing and are subject to review of ENGINEER.

3.02 FORM REMOVAL

A. Supporting forms and shoring shall not be removed until the member has acquired sufficient strength to support its own weight and the construction live loads on it.

B. All form removal shall be accomplished in such a manner that will prevent injury to the concrete and will ensure complete safety of the structure.

C. Forms shall not be removed before the expiration of the minimum times as stated below unless specifically authorized by ENGINEER. These times may be increased by ENGINEER. Wall and vertical faces: 24 hours.

END OF SECTION

SECTION 03560

CONCRETE SURFACE REPAIR

PART 1–GENERAL

1.01 SUMMARY

A. Work Included: Miscellaneous concrete surface repairs.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

C. Repair Locations: Light pole 1, 6, 7 concrete bases as shown on the drawings.

1.02 SUBMITTALS

A. Comply with Section 01300–Submittals.

B. Product Data: Submit manufacturer's technical data sheets for each product.

C. Submit list of project references as documented in this specification under 1.03 Quality Assurance. Include contact name and phone number of person charged with oversight of each project.

1.03 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer Qualifications: Company with minimum 15 years of experience in manufacturing of specified products and systems.
   2. Applicator Qualifications:
      a. Company with minimum of 5 years experience in application of specified products and systems on projects of similar size and scope, and is acceptable to product manufacturer.
      b. Successful completion of a minimum of five projects of similar size and complexity to specified Work.

1.04 PROJECT CONDITIONS

A. Environmental Requirements:
   1. Application range of repair mortar is from 20°F (min 7°C) to 85°F (29°C). Follow ACI-recommended concreting practices for hot or cold weather.
   2. Ensure that frost or frozen surfaces are thawed and dry.
   3. Do not apply material if snow, rain, fog, or mist is anticipated within 12 hours after application. Allow surfaces to attain temperature and conditions specified before proceeding with application.

PART 2–PRODUCTS

2.01 MANUFACTURER

A. Repair materials shall be by BASF Building Systems, or equal.

2.02 MATERIALS

A. Anchor Bolt Repairs: Repair mortar shall be one component, rheoplastic, shrinkage-compensated, fiber-reinforced, cementitious repair mortar, EMACO S88-CI by BASF Building Systems, or equal.

B. Reinforcing Primer: Primer for reinforcing shall be a 2-component, polymer-modified, cementitious bonding agent, and anticorrosion coating, EMACO P24 by BASF Building Systems, or equal.

PART 3–EXECUTION

3.01 IDENTIFICATION

A. When existing light pole enclosures and base plates are removed from service and are available for inspection, CONTRACTOR and ENGINEER shall observe conditions and identify areas to be repaired. Where practicable, approximate quantities of repair material shall be agreed upon prior to commencement of repairs. Where quantities may be affected by subsurface conditions not visible prior to repairs, quantities shall be determined and agreed upon as soon as practicable after removal of unsound concrete.

3.02 SURFACE PREPARATION

A. Protect adjacent Work areas and finish surfaces from damage during repair work.

B. Concrete:
   1. Remove unsound or delaminated concrete, providing minimum of 1/4-inch (6 mm) substrate profile and 3/4-inch (19 mm) clearance behind corroded reinforcing steel.
   2. After removal of concrete, but before placement, mechanically abrade concrete surface to remove bond-inhibiting materials and to provide additional mechanical bond. Do not use method of surface preparation that will fracture concrete. Verify absence of microcracking or bruising according to ICRI Guideline No. 310.2.
   3. Sawcut straight edges along repair area perimeters minimum of 1 inch (25 mm) deep to eliminate feather edges. Do not cut reinforcement.
   4. Report cracks that appear in interface area of patch or overlay to ENGINEER, and repair.
   5. Dampen base concrete interface to be repaired to saturated surface dry (SSD) conditions by wetting, fogging, or ponding with clean water for 24 hours.

C. Reinforcing Steel:
   1. Expose full circumference of corroded steel in areas to be repaired.
   2. Remove oxidation and scale from exposed reinforcing steel according to ICRI Technical Guideline No. 310.1R *Guide to Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion*.

3. To prevent future steel corrosion, coat prepared reinforcing steel with reinforcing primer as specified.
4. Any existing reinforcement displaced by prior demolition operations shall be bent back into place.

3.03 INSTALLATION

A. Substrate shall be SSD with no standing water during application.

B. Mix components and apply concrete according to manufacturer's instructions.

C. Repair areas shall be water-cured for 7 days or use an approved curing compound compatible with coatings if area is to be overcoated.

END OF SECTION

SECTION 04900

MASONRY RESTORATION AND CLEANING

PART 1–GENERAL

1.01 SUMMARY

A. Work Included: Remove and relay of sandstone masonry wall.

B. Related sections and divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 REFERENCES

A. ACI 530/ASCE 5/TMS 402–Building Requirements for Masonry Structures; American Concrete Institute International; 2002.

B. ACI 530.1/ASCE 6/TMS 602–Specification for Masonry Structures; American Concrete Institute International; 2002.

C. IMIAWC (CW)–Recommended Practices & Guide Specifications for Cold Weather Masonry Construction; International Masonry Industry All-Weather Council; 1993.

D. IMIAWC (HW)–Recommended Practices & Guide Specifications for Hot Weather Masonry Construction; International Masonry Industry All-Weather Council; current edition.

1.03 SUBMITTALS

A. Product Data: Provide data on mortar mixes.

1.04 QUALITY ASSURANCE

A. Comply with provisions of ACI 530/ASCE 5/TMS 402 and ACI 530.1/ASCE 6/TMS 602, except where exceeded by requirements of the Contract Documents.

B. Company specializing in masonry restoration with minimum 5 years of documented experience on historic masonry structures.

1.05 PREINSTALLATION MEETING

A. Require attendance of parties directly affecting work of this section.

B. Review conditions of installation, installation procedures, and coordination with related work.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements: Comply with recommendations of IMIAWC (CW).

B. Hot Weather Requirements: Comply with IMIAWC Recommended Practices and Guide Specifications for Hot Weather Masonry Construction.

PART 2–PRODUCTS

2.01 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type 1; color as required to produce approved color sample.

B. Hydrated Lime: ASTM C 207, Type S.

C. Mortar Aggregate: ASTM C 144.

D. Pigments for Colored Mortar: Iron or chromium oxides with demonstrated stability and colorfastness.

E. Sand: ASTM C 144.

F. Water: Clean and potable.

G. Additives: None permitted.

PART 3–EXECUTION

3.01 EXAMINATION

A. Verify that surfaces to be removed and restored are ready for work of this section.

3.02 PREPARATION

A. Protect surrounding elements from damage because of restoration procedures.

B. Carefully remove and store removed sandstone blocks in a safe location; reinstall upon completion of baseplate installation.

3.03 REBUILDING

A. Cut out sandstone blocks with care in a manner to prevent damage to any adjacent remaining materials. A minimum section of wall is to be removed which will facilitate light pole baseplate installation.

B. Cut away loose or unsound adjoining masonry or mortar to provide firm and solid bearing for new work.

C. Mortar Mix: ASTM C 270, using the Proportion Specification. Colored to match existing work.

D. Mixing: Use mechanical batch mixer and comply with referenced standards.

E. Ensure that reinforcing is correctly located and built in.

F. Install built in masonry work to match and align with existing, with joints and coursing true and level, faces plumb and in line.

3.04 PROGRESS AND FINAL CLEANING

A. Immediately remove stains, efflorescence, or other excess resulting from the work of this section.

B. Remove excess mortar, smears, and droppings as work proceeds and upon completion.

C. Clean surrounding surfaces.

END OF SECTION

SECTION 05120

STRUCTURAL STEEL

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Structural carbon steel framing members.
   2. Steel base plates and bearing plates.
   3. Structural steel bolted connections and anchor bolts.
   4. Welding of structural steel.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 REFERENCES

A. AISC–Code of Standard Practice–Manual of Steel Construction–Allowable Stress Design (ASD).

B. ASTM A36/A36M–Structural Steel.

C. ASTM A53–Pipe, Steel, Black, and Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe.

D. ASTM A123–Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products.

E. ASTM A153–Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

F. ASTM A307–Carbon Steel Externally Threaded Standard Fasteners.

G. ASTM A325–High-Strength Bolts for Structural Steel Joints.

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

I. ASTM A992/A992M–Standard Specification for Structural Steel.

J. AWS A2.4–Symbols for Welding, Brazing, and Nondestructive Examination.

K. AWS D1.1–Structural Welding Code.

L. SSPC (Steel Structures Painting Council)–Painting Manual.

1.03 SUBMITTALS FOR REVIEW

A. Comply with pertinent provisions of Section 01300–Submittals.

B. Provide shop drawings with complete details and schedules for fabrication and shop assembly of members.
   1. Include details of cuts, connections, camber, holes, and other pertinent data.
   2. Indicate welds by AWS symbols, and show size, length, and type of weld.
   3. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages.
   4. Identify details by reference to sheet and detail number on the drawings.

C. Except as shown otherwise, structural steel details shall conform to standard practice as illustrated in Structural Shop Drafting Textbook of the AISC.

1.04 QUALITY ASSURANCE

A. Fabricate structural steel members in accordance with AISC Code of Standard Practice.

B. Mill Test Reports: Submit indicating structural strength and composition.

C. Welders Certificates: Certify welders employed on the work, verifying AWS qualification within the previous 12 months.

1.05 QUALIFICATIONS

A. Qualify welding processes and welding operators in accordance with AWS “Standard Qualifications Procedures.”

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver all materials to job site properly marked to identify the structure for which it is intended and at such intervals to insure uninterrupted progress of the work. Marking shall correspond to markings indicated on the shop drawings.

B. Store all members off the ground using pallets, platforms, or other supports.

C. Do not store materials on the structure in a manner that might cause distortion or damage to the members of the supporting structures.

D. In the event of damage, immediately make all repairs and replacements necessary at no additional cost to OWNER.

PART 2–PRODUCTS

2.01 MATERIALS

A. Structural Steel Members: ASTM A36/A36M (channels, angles, plates).

B. Bolts, Nuts, and Washers: ASTM A307 or ASTM A325, galvanized in accordance with ASTM A123 and A153.

C. Welding Materials: AWS D1.1; E70XX electrodes.

D. Galvanizing: ASTM A123 and A153 for structural steel plates, shapes and bars, and structural steel tubing. ASTM A53 for steel pipe.

2.02 FABRICATION

A. Fabrication and Assembly:
1. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on the approved shop drawings.
2. Properly mark and match-mark materials for field assembly and for identification as to structure and site for which intended.
3. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.
4. Where finishing is required, complete the assembly, including welding of units, before start of finishing operation.
5. Provide finish surfaces of members exposed in the final structure free of markings, burrs, and other defects.

B. Connections:
1. Bolts and washers of all types and sizes shall be provided for completion of all field erection.
2. Comply with AWS Code for procedures, appearance, and quality of welds used in correcting welded work.
3. Assemble and weld built-up sections to produce true alignment of axes without warp.
4. Welding shall be done by the shielded arc process.
5. All welds shall be chipped, ground smooth, and primed immediately after fabrication.

C. Holes for Other Work:
1. Provide holes for securing other work to structural steel framing and for the passage of other work through steel framing members as indicated.
2. Provide threaded nuts welded to framing and other specialty items as shown to receive other work.
3. Drill, cut, or punch holes perpendicular to metal surfaces.
4. Do not flame cut holes or enlarge holes by burning.
5. Drill holes in all bearing plates.

2.03 FINISH

A. Before shipping, prepare structural component surfaces in accordance with SSPC SP 10.

B. Do not prime surfaces that will be field-welded, galvanized, or high-strength bolted with friction-type connection.

C. Surfaces which will be inaccessible after assembly or erection shall be field finish coated prior to assembly or erection.

PART 3–EXECUTION

3.01 EXAMINATION

A. Correct conditions detrimental to proper and timely completion of the work.

B. Do not proceed until unsatisfactory conditions have been corrected.

3.02 ERECTION

A. General: Comply with AISC Specifications and Code of Standard Practice and as specified herein.

B. Surveys:
1. Establish permanent bench marks necessary for the accurate erection of structural steel.
2. Check elevations of concrete and masonry, bearing surfaces, and locations of anchor bolts and similar items before erection proceeds.

C. Temporary Shoring and Bracing:
1. Provide temporary shoring and bracing members with connection of sufficient strength to bear imposed loads.
2. Provide temporary guidelines to achieve proper alignment of the structures as erection proceeds.
3. Remove temporary connections and members when permanent members are in place and final connections are made.

D. Anchor Bolts:
1. Provide anchor bolts and other connectors for securing structural steel to foundations and other in-place work.
2. Provide templates and other devices as needed for the presetting of bolts and other anchors to accurate locations.

E. Setting Bases and Bearing Plates:
1. Clean bearing surfaces free from bond-reducing materials and then roughen to improve bond to surface.
2. Set loose and attached base plates and bearing plates for structural members using wedges, leveling nuts, or other adjusting devices.
3. Tighten anchor bolts after the supported members have been positioned and plumbed.
4. Finish exposed surfaces, protect installed materials, and allow to cure in strict compliance with the manufacturer’s instructions.

F. Field Assembly:
1. Set structural frames accurately to the lines and elevations indicated. Align and adjust the various members forming a part of a complete frame or structure before fastening permanently.
2. Clean the bearing surfaces and other surfaces which will be in permanent contact before assembly.
3. Perform necessary adjustments to compensate for discrepancies in elevation and alignment.
4. Level and plumb individual members of the structure within specified AISC tolerances.
5. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

G. Gas Cutting:
1. Do not use gas cutting torches in the field for correcting fabricating errors in the structural framing.

2. Cutting will be permitted only on secondary members which are not under stress as acceptable to ENGINEER.
3. When gas cutting is permitted, finish the sections equal to the sheared appearance.

H. After erection, prime welds, abrasions, and surfaces not shop-primed or galvanized, except surfaces to be in contact with concrete.

3.03 FIELD QUALITY CONTROL

A. CONTRACTOR shall inspect all field-bolted connections in accordance with the AISC Specifications.

B. Field Welding:
1. CONTRACTOR shall visually inspect all welds and test during erection of structural steel.
2. CONTRACTOR shall certify welders and conduct inspections and tests as required by applicable standards.
3. CONTRACTOR shall record types and locations of defects found and record the work required and performed to correct deficiencies.

C. Correction:
1. Correct deficiencies in structural steel work which inspections and test reports have indicated to be not in compliance with the specified requirements.
2. CONTRACTOR shall perform all additional testing required to show compliance of corrected work.

END OF SECTION

SECTION 05500

METAL FABRICATIONS

PART 1–GENERAL

1.01 SUMMARY

A. Work Included: Shop-fabricated carbon steel and stainless steel items.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 REFERENCES

A. ASTM A36–Structural Steel.

B. ASTM A123–Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

C. ASTM A143–Practice for Safeguarding Against Embrittlement of Hot-Dipped Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.

D. ASTM A153–Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

E. ASTM A307–Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

F. ASTM A384–Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies.

G. ASTM A385–Practice for Providing High Quality Zinc Coatings (Hot-Dipped).

H. ASTM A570–Hot-Rolled Carbon Steel Sheet and Strip, Structural Quality.

I. ASTM A611–Steel Sheet, Carbon, Cold-Rolled, Structural Quality.

J. AWS A2.0–Standard Welding Symbols.

K. AWS D1.1–Structural Welding Code.

1.03 DESIGN REQUIREMENTS

A. All fabrications shall meet applicable code requirements including OSHA.

1.04 SUBMITTALS FOR REVIEW

A. Comply with pertinent provisions of Section 01300–Submittals.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, sections, elevations, and details where applicable.

C. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

1.05 QUALITY ASSURANCE

A. Fabricate steel members in accordance with AISC Code of Standard Practice.

B. Mill Test Reports: Submit indicating structural strength and composition.

C. Welders Certificates: Certify welders employed on the work, verifying AWS qualification within the previous 12 months.

1.06 QUALIFICATIONS

A. Qualify welding processes and welding operators in accordance with AWS "Standard Qualifications Procedures."

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver all materials to job site properly marked to identify the structure for which it is intended and at such intervals to insure uninterrupted progress of the work. Marking shall correspond to markings indicated on the shop drawings.

B. Store all members off the ground using pallets, platforms, or other supports.

C. Do not store materials on the structure in a manner that might cause distortion or damage to the members of the supporting structures.

D. In the event of damage, immediately make all repairs and replacements necessary at no additional cost to OWNER.

PART 2–PRODUCTS

2.01 MATERIALS–CARBON STEEL

A. Welding Materials: AWS D1.1; E70XX electrodes.

B. Select fasteners for the type, grade, and class required.

2.02 MATERIALS–STAINLESS STEEL

A. Unless otherwise noted, all stainless steel shall meet the requirements of ASTM A240 and shall be Type 316L.

B. If components are not available in Type 316L, other 300 Series type shall be used as approved by ENGINEER.

2.03 FABRICATION

A. Fabrication and Assembly:
   1. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on the approved shop drawings.
   2. Properly mark and match-mark materials for field assembly and for identification as to structure and site for which intended.
   3. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.
   4. Where finishing is required, complete the assembly, including welding of units, before start of finishing operation.
   5. Provide finish surfaces of members exposed in the final structure free of markings, burrs, and other defects.

B. Connections:
   1. Bolts and washers of all types and sizes shall be provided for completion of all field erection.
   2. Comply with AWS Code for procedures, appearance, and quality of welds used in correcting welded work.
   3. Assemble and weld built-up sections to produce true alignment of axes without warp.
   4. Welding shall be done by the shielded arc process.
   5. All welds shall be chipped, ground smooth, and primed immediately after fabrication.

C. Workmanship:
   1. Use materials of size and thickness shown or, if not shown, of size and thickness to produce strength and durability in the finished product.
   2. Work to dimensions shown or accepted on the Shop drawings using proven details of fabrication and support.
   3. Form exposed work true to line and level, with accurate angles and surfaces, and with straight sharp edges.
   4. Form bent metal corners to smallest radius possible without causing grain separation or otherwise impairing works.
   5. Cap all open ends of pipe and structural tubing.
   6. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush; match and blend with adjoining surfaces.
   7. Provide for anchorage of the type shown. Coordinate with supporting structures. Fabricate and space the anchoring devices to provide adequate support for intended use.
   8. Cut, reinforce, drill, and tap miscellaneous metal work as indicated to receive hardware and similar items.

2.04 FINISHES

A. Do not prime surfaces where galvanizing or field welding is required.

B. Structural Steel Members: Galvanize after fabrication to the requirements in this section and ASTM A123.

C. Surfaces which will be inaccessible after assembly or erection shall be finish painted prior to assembly or erection.

D. Galvanizing:
   1. All items, except piping designated to be galvanized, shall be hot-dipped galvanized in accordance with ASTM Specification A123 and A153. Furnish a Certificate of Compliance stating that the galvanizing complies with ASTM Specifications and Standards and all other applicable requirements specified herein.
   2. Fabrication of items to be galvanized shall be in accordance with ASTM A143, A384, and A385. Structural steel shall be fabricated generally in accordance with Class 1 guidelines as shown in "Recommended Details for Galvanized Structures" as published by the American Hot Dip Galvanizer's Association, Inc.
   3. Galvanized items shall be handled, transported, and stored to prevent damage or staining to the coating. Maintain adequate ventilation and continuous drainage.
   4. Steel shall conform to ASTM A36 except that the silicone content shall be in the range of 0 to 0.04%.
   5. Steel work shall be precleaned utilizing a caustic bath, acid pickle and flux, or shall be blast cleaned and fluxed. In either case, all surface contaminants and coatings shall be removed.
   6. All welding shall be performed in accordance with the American Welding Society publication D19.0-72, "Welding Zinc Coated Steel." All uncoated weld areas shall be touched up.

PART 3–EXECUTION

3.01 EXAMINATION

A. Correct conditions detrimental to the proper and timely completion of the work.

B. Do not proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Furnish setting drawings, diagrams, templates, instructions, and directions for installation of anchorages such as concrete inserts, anchor bolts, and miscellaneous items having integral anchors which are to be embedded in concrete construction.

B. Coordinate delivery of such items to project.

3.03 INSTALLATION

A. Cutting, Fitting and Placement:
   1. Perform cutting, drilling, and fitting for installation of miscellaneous metal fabrications.
   2. Set work accurately in location, alignment, and elevation and make plumb, level, true, and free from rack measured from established lines and levels.
   3. Fit exposed connections accurately together to form tight hairline joints.
   4. Weld connections which are not to be left as exposed joints, grind joints smooth, and touch-up shop paint coat or galvanizing repair.

3.04 FIELD WELDING

A. Comply with AWS Code for procedures of manual shielded metal arc welding, appearance and quality of weld made, and methods in correcting welding work.

3.05 GALVANIZING REPAIR

A. Areas damaged by welding, flame-cutting or during handling, transport, or erection shall be repaired by one of the following methods whenever damage exceeds 3/16 inches in width.
   1. Cold Galvanizing Compound:
      a. Surfaces to be reconditioned with zinc-rich paint shall be clean, dry, and free of oil, grease, and corrosion products.
      b. Areas to be repaired shall be power disc-sanded to bright metal. To ensure that a smooth reconditioned coating can be effected, surface preparation shall extend into the undamaged galvanized coating.
      c. Touch-up paint shall be an organic cold-galvanized compound having a minimum of 94% zinc dust in the dry film.
      d. The paint shall be spray- or brush-applied in multiple coats until a dry film thickness of 8 mils minimum has been achieved. A finish coat of aluminum paint shall be applied to provide a color blend with the surrounding galvanizing.
      e. Coating thickness shall be verified by measurements with a magnetic or electromagnetic gauge.
   2. Zinc-Based Solder:
      a. Surfaces to be reconditioned with zinc-based solder shall be clean, dry, and free of oil, grease, and corrosion products.
      b. Areas to be repaired shall be wire brushed.
      c. Heat shall be applied slowly and broadly close to but not directly onto the area to be repaired. The zinc-based solder rod shall be rubbed onto the heated metal until the rod begins to melt. A flexible blade or wire brush shall be used to spread the melt over the area to be covered. The zinc-based solder shall be applied in a minimum thickness of 2 mils.
      d. Coating thickness shall be verified by measurements with a magnetic or electromagnetic gauge.

3.06 SCHEDULE

A. The following schedule is a list of principal items only. Refer to Drawing details for items not specifically scheduled.

B. Steel base plates and side plates.

END OF SECTION

SECTION 05560

ANCHOR BOLTS, EXPANSION BOLTS, AND ADHESIVE ANCHORS

PART 1–GENERAL

1.01 SUMMARY

A. Work Included: Anchor bolts and adhesive anchors.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 REFERENCES

A. ASTM A36/A36M–Structural Steel.

B. ASTM F1554-Anchor Bolts, Steel, 36, 55, and 105-ksi yield strength.

C. ICC-ES International Code Council-Evaluation Service.

D. AC 193-Acceptance Criteria for Mechanical Anchors in Concrete Elements.

E. AC 308-Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete.

PART 2–PRODUCTS

2.01 ANCHOR BOLTS

A. Anchor bolt extensions complete with sleeve nuts, washers, and nuts shall be fabricated as shown or as specified by the equipment manufacturer and unless otherwise indicated shall be hot-dip galvanized carbon steel or 316 stainless steel. Anchor bolts shall, as a minimum, conform to the requirements of ASTM F1554-Grade 36.

B. Sleeve nuts shall be Cleveland City Forge, or equal, and sized to be compatible with the existing anchor bolts. Sleeve nuts shall be hot dipped galvanized.

2.02 ADHESIVE ANCHORS

A. Adhesive anchors shall be PE 1000+ by Powers Fastening Systems, Set-XP by Simpson Strong-Tie Anchor Systems, or equal.

B. Unless waived by ENGINEER for certain applications, all adhesive anchors shall comply with the Wisconsin Commercial Building Code and AC 308. They shall be ICC-ES approved for use in cracked and uncracked concrete.

PART 3–EXECUTION

3.01 ANCHOR BOLTS

A. Anchor bolt repairs shall be located as shown and specified.

B. Thread exposed portion of existing anchor bolt for sleeve nut. Solvent clean and coat entire assembly with zinc rich coating.

C. All dirt or foreign materials shall be removed prior to embedding into concrete. After anchor bolts have been embedded, their threads shall be protected by grease and by installing the nuts or by other means until the time of installation of the equipment or metal work.

3.02 ADHESIVE ANCHORS

A. At locations shown on the drawings, threaded rod shall be provided in existing concrete by drilling holes, injecting epoxy adhesive, and inserting the threaded rod.

B. All procedures shall be in accordance with the manufacturer's recommendations.

C. Where location of anchors is adjustable, reinforcing steel shall be located prior to drilling holes and bolts and shall be located to clear reinforcing steel.

END OF SECTION

SECTION 07270

FIRESTOPPING

PART 1–GENERAL

1.01 SUMMARY

A. Work Included: Silicone firestopping sealant for sealing annular spaces around conduit penetrations through fire-rated assemblies and to seal gaps at intersections of walls and floors/ceilings.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 REFERENCES

A. UL 1479–Fire Tests of Through-Penetration Fire Stops.

B. UL–Fire Hazard Classifications.

1.03 REGULATORY REQUIREMENTS

A. Firestopping materials and installation shall conform to the applicable building code requirements, including fire-resistance ratings and surface-burning characteristics.

B. Provide certificate of compliance from local building inspector indicating approval of firestopping materials and installation.

PART 2–PRODUCTS

2.01 FIRESTOPPING SEALANT

A. Firestopping sealant for conduit penetrations through fire-rated assemblies shall be a single-component silicone elastomer.

B. Acceptable products include the following, or equal: Fire Barrier Silicone Sealant 2000 by 3M Corporation.

2.02 DAMMING MATERIAL

A. Damming material shall be fire-resistant mineral fiber (if left in place) or other combustible material (if removed), as directed by the appropriate fire-tested designs.

2.03 PRIMER AND WRAP STRIP

A. Primer for firestopping sealant shall be 3M Corporation, or equal.

B. Wrap strip for firestopping sealant shall be 3M Fire Barrier FS-195 Wrap/Strip, or equal.

PART 3–EXECUTION

3.01 INSTALLATION

A. Firestopping sealant shall be applied according to manufacturer's written instructions and shall achieve a fire rating equal to rating of construction which is penetrated. Substrate shall be free of all combustible materials (except damming material for later removal), loose impediment, oil, and other free liquids.

B. Install damming material to establish the thickness and hold the firestopping foam/sealant in place. Follow the manufacturer's installation instructions. All gaps or cracks left after damming materials are in place must be sealed.

C. Apply primer and wrap strip in accordance with manufacturer's instructions prior to installing sealant. Apply sealant to a minimum depth of 1 1/2 inches and with uniform density and texture.

D. Remove combustible damming material after sealant has cured. Noncombustible damming material may be left in place.

3.02 QUALITY CONTROL

A. Check completed work for complete adhesion and seal 48 hours after sealant application.

B. Clean adjacent surfaces of excess sealant using a compatible solvent in accordance with the manufacturer's instructions.

END OF SECTION

SECTION 16010

GENERAL ELECTRICAL REQUIREMENTS

PART 1–GENERAL

1.01 SUMMARY

A. Work includes general requirements for all electrical work.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 REFERENCES

A. ANSI/NFPA 70–National Electrical Code.

B. ANSI/IEEE C2.

1.03 CONTRACT DOCUMENTS

A. Any device or fixture roughed in improperly and/or not positioned on implied centerlines or as dictated by good practice shall be repositioned at no cost to OWNER.

B. The drawings are generally diagrammatic, and CONTRACTOR shall coordinate the work so that interferences are avoided. Provide all offsets in conduit, fittings, etc., necessary to properly install the work. All offsets, fittings, etc., shall be provided without additional expense to OWNER.

1.04 REGULATORY REQUIREMENTS

A. Conform to ANSI/NFPA 70.

B. Conform to ANSI/IEEE C2.

C. The rules and regulations of the federal, state, local, civil authorities, and utility companies in force at the time of execution of the Contract shall become a part of this specification.

D. Obtain electrical permits and inspections from authority having jurisdiction. Costs for permits and inspections shall be by CONTRACTOR.

1.05 CODES AND ORDINANCES

A. CONTRACTOR is expected to know or to ascertain, in general and in detail, the requirements of all codes and ordinances applicable to the construction and operation of systems covered by this Contract. CONTRACTOR shall know or ascertain the rulings and interpretations of code requirements being made by all authorities having jurisdiction over the work to be performed by them.

B. In preparing Bid, CONTRACTOR shall include the cost of all items and procedures necessary to satisfy the requirements of all applicable codes, ordinances, and authorities, whether or not these are specifically covered by the drawings and specifications. All cases of serious conflict or omission between the drawings, specifications, and codes shall be brought to ENGINEER's attention, as herein before specified. CONTRACTOR shall carry out work and complete construction as required by applicable codes and ordinances and in such a manner as to obtain approval of all authorities whose approval is required.

C. When requested by ENGINEER, CONTRACTOR shall provide written calculations to show compliance with applicable codes or the Contract Documents. This shall include, but not be limited to, conduit and wire sizing, junction and pull box fill and sizing, conductor derating, and voltage drop. CONTRACTOR shall indicate calculation method used, as well as compliance with applicable code, drawing, or specification.

1.06 ELECTRICAL DISTRIBUTION SYSTEM

A. Provide a complete electrical distribution system consisting of components indicated on the drawings or specified herein, including but not limited to:
   1. All control wiring.
   2. Access panels and access doors for access to equipment installed by Division 16.
   3. Wiring between system components if equipment is not prewired.
   4. Lighting fixtures, lighting poles, lighting controls, and associated wiring.
   5. Support system design and supports for electrical raceways.
   6. Code-required disconnects.
   7. Sound system equipment, loudspeakers, controls, and associated wiring.

B. Provide balancing and adjusting of electrical loads.

C. CONTRACTOR shall instruct OWNER's representative in the operation and maintenance of all equipment. The instruction shall include a complete operating cycle on all apparatus.

D. Provide miscellaneous items for a complete and functioning system as indicated on the drawings and specified herein.

1.07 NOISE

A. Eliminate any abnormal noises which are not considered by ENGINEER to be an inherent part of the systems as designed. Abnormal buzzing in equipment components and loudspeakers will not be acceptable.

1.08 DRAWINGS

A. The drawings indicate approximate locations of the various items of the electrical systems. These items are shown approximately to scale and attempt to show how these items should be integrated with building construction. Locate all the various items by on-the-job measurements in conformance with Contract.

B. In certain instances, audio jacks, switches, or other electrical devices and equipment, etc., may be relocated. Where relocation is within 10 feet of location shown on drawings, and when CONTRACTOR is informed of necessary relocation before work is begun on this portion of the job, the relocation shall be at CONTRACTOR's expense.

C. The drawings are schematic in nature and are not intended to show exact locations of conduit, but rather to indicate distribution, circuitry, and control.

1.09 EXISTING UNDERGROUND UTILITIES

A. The drawings show approximate location of existing underground irrigation piping based on OWNER-provided record drawings. Record drawings and electronic surveys of existing underground utilities are available from OWNER. CONTRACTOR shall excavate and verify the location of all underground electrical prior to installing new electrical equipment and prior to making modifications to existing electrical. This shall include, but not be limited to, feeders to equipment, branch circuit wiring, phone and communication cabling, and control wiring. CONTRACTOR shall temporarily relocate existing underground electrical to keep the existing facility in operation and for any new construction, and all costs for relocating existing electrical shall be included in the Bid.

1.10 SUBMITTALS

A. CONTRACTOR shall submit to OWNER for approval prior to beginning work, shop drawings on the equipment and materials proposed to be furnished and installed. See Section 01300–Submittals for requirements.

B. CONTRACTOR shall, in addition, submit drawings and/or diagrams for review and for job coordination in all cases where deviation from the Contract Drawings are contemplated because of job conditions, interference or substitution of equipment, or when requested by ENGINEER for purposes of clarification of CONTRACTOR's intent. CONTRACTOR shall also submit detailed drawings, rough-in sheets, etc., for all special or custom-built items or equipment. Drawings and details under this section shall include, but not be limited to, the following, where applicable to this project: Electrical interconnection wiring diagrams; see Section 16540–Athletic Field Lighting and Section 16740–Athletic Field Sound Systems.

C. These drawings and diagrams shall show all electrical equipment ratings and sizes, as well as the manufacturer's name and catalog number for each piece of equipment used.

D. Equipment and material submittals must show sufficient data to indicate complete compliance with Contract Documents as follows:
   1. Proper sizes and capacities.
   2. That the item will fit in the available space in the manner that will allow proper service.
   3. Construction materials and finishes.

E. When the manufacturer's reference numbers are different from those specified, provide correct cross-reference number for each item. The shop drawings shall be clearly marked and noted accordingly.

F. When fixtures, equipment, and items specified include accessories, parts, and additional items under one designation, shop drawings shall be complete and include all components.

G. See additional requirements of shop drawings under Division 1–General Requirements.

PART 2–PRODUCTS

2.01 STANDARD PRODUCTS

A. All equipment shall be UL and NEMA approved.

B. All equipment and wiring shall be selected and installed for conditions in which it will perform (e.g., general purpose, weatherproof, raintight, dusttight, or any other special type).

2.02 SUBSTITUTION OF MATERIALS AND EQUIPMENT

A. While it is not the intention of OWNER to discriminate against any manufacturer of equipment which may be equivalent to specified equipment, a strict interpretation of such equivalency will be exercised in considering any equipment offered as a substitute for specified equipment. CONTRACTOR shall submit with each request for approval of substitute material or equipment, sufficient data to show conclusively that it is equivalent to that specified in the following respects:
   1. Performance:
      a. Capacity at conditions and operating requirements specified shall be equal to or greater than that of the specified equipment.
      b. Energy consumption at the specified rating shall not exceed that of the specified equipment.
      c. Vibration and noise production at the point of rating shall not exceed that of the specified equipment.
   2. Materials of construction.
   3. Gauges, weights, and sizes of all portions and component parts.
   4. Design arrangements, methods of construction, and workmanship.
   5. Coatings, finishes, and durability of wearing parts.
   6. National reputation of the manufacturer as a producer of first quality equipment of the type under consideration.
   7. Availability of prompt, reliable, and efficient service facilities franchised by or affiliated with the equipment manufacturer. This shall include the maintenance of local stocks of critical replacement parts equal to those maintained for the specified equipment.

B. Requests for substitution shall include CONTRACTOR's reason for the request.

C. If ENGINEER does not consider the items equivalent to those specified, CONTRACTOR shall provide those specified.

D. See General Conditions for additional requirements.

PART 3–EXECUTION

3.01 CONTINUITY OF SERVICE

A. CONTRACTOR shall provide and maintain continuous services (power, controls, alarms, etc.) during the entire construction period.

B. No service shall be interrupted or changed without permission from OWNER. Written permission shall be obtained before any work is started.

C. When interruption of service is required, all persons concerned shall be notified and a prearranged time agreed upon. Notice shall be a minimum of 72 hours prior to the interruption.

3.02 CLEANING UP AND REMOVAL OF RUBBISH

A. All control panels, distribution panels, equipment racks, junction boxes, and pullboxes shall be cleaned of debris and wires neatly arranged with surplus length cut off prior to installation of covers.

B. Where louvers are provided in enclosures, louvers shall be vacuumed free of all dust and dirt. Where air filters are provided in equipment such as control panels, CONTRACTOR shall replace all filters with new filters at the time of final completion.

C. All lighting fixture lenses and lamps shall be cleaned at time of installation, and all lens exteriors shall be cleaned just prior to final inspection.

D. Equipment shall be thoroughly cleaned of all stains, paint spots, dirt, and dust. All temporary labels not used for instruction or operation shall be removed.

3.03 PAINTING

A. All painting of electrical equipment shall be done by CONTRACTOR unless equipment is specified to be furnished with factory-applied finish coats.

B. All electrical equipment shall be provided with factory-applied prime finish, unless otherwise specified.

C. If the factory finish on any equipment furnished by CONTRACTOR is damaged in shipment or during construction, the equipment shall be refinished by CONTRACTOR.

3.04 CAULKING

A. Caulk with a caulking sealant where indicated on the electrical drawings or hereinafter specified.

B. Caulking sealant shall be silicone construction sealant as manufactured by General Electric or two-part polysulfide conforming to the requirements and bearing the seal of the Thiokol Chemical Corporation.

C. Caulking sealant shall contain no acid or ingredients which will stain stone, corrode metal, or have injurious effect on painting. It shall be colored to match adjacent surroundings.

D. Caulking shall be performed by craftsman skilled at such work.

3.05 BUILDING ACCESS

A. CONTRACTOR shall arrange for the necessary openings in the building to allow for admittance of all apparatus.

3.06 COORDINATION

A. Provide wiring for all electrically-powered or electrically-controlled equipment.

B. All wire, cables, conduit, and other devices for the power and control of electrical equipment shall be provided by CONTRACTOR except as specifically noted elsewhere in these specifications or on the drawings.

C. CONTRACTOR shall connect and wire all apparatus according to approved wiring diagrams.

3.07 EXCAVATION AND BACKFILL

A. Backfill of exterior trenches and pits shall be compacted granular fill, unless otherwise noted. Compaction shall meet the requirements of Section 02222–Excavation, Fill, Backfill, and Grading. Refer to Section 16110-Conduit for additional requirements associated with PVC conduit installed in earth.

B. Care shall be taken to ensure no disturbance of bearing soil under foundations.

3.08 EQUIPMENT ACCESS AND LOCATION

A. CONTRACTOR shall coordinate work of this division with that of other divisions so that all systems, equipment, and other components of the building will be installed at the proper time, will fit the available space, and will allow proper service access to those items requiring maintenance. Any components for the electrical systems which are installed without regard to the above shall be removed and relocated as required to provide adequate access at CONTRACTOR’s expense.

B. Where various items of equipment and materials are specified and scheduled, the purpose is to define the general type and quality level, not to set forth the exact trim to fit the various types of wall or floor finishes. Provide materials which will fit properly the types of finishes actually installed.

C. All equipment, junction and pull boxes, and accessories shall be installed to permit access to equipment for maintenance. Any relocation of conduits, equipment, or accessories to provide maintenance access shall be accomplished by CONTRACTOR at no additional cost.

D. Electrical equipment, devices, instruments, hardware, etc. shall be installed with ample space allowed for removal, repair, calibration or changes to the equipment. Ready accessibility to equipment and wiring shall be provided without moving other equipment which is to be installed or which is already in place.

E. Locate audio jacks, switches, and other electrical equipment to fit the details, panels, decorating, or finish of the space. OWNER shall reserve the right to make minor position changes of the jacks and switches before the work has been installed.

3.09 WORKMANSHIP

A. Install work using procedures defined in NECA Standard of Installation.

B. Utilization equipment and control devices required under these specifications shall be mounted in a code-approved manner.

C. Locations of utilization equipment and control devices as shown on drawings are within 10 feet of actual positions. Any mounting of this equipment within this 10-foot distance will be performed at no additional cost to OWNER.

D. Unless otherwise noted, equipment shall be fastened to building structure or equipment framework and not placed on the floor.

E. Where materials, equipment apparatus, or other products are specified by manufacturer, brand name, and type or catalog number, such designation is to establish standards of desired quality and style and shall be the basis of the Bid.

F. Materials and equipment of the types for which there are National Board of Fire Underwriters Laboratories (UL) listing, and label service shall be so labeled and shall be used by CONTRACTOR.

3.10 AREA CLASSIFICATION

A. As noted on the drawings.

3.11 MODIFICATIONS TO EXISTING CONSTRUCTION

A. Alterations:
   1. Alter, extend, and reconnect conduits as necessary.
   2. Reconnect existing conduits which were reused, cut, or exposed because of construction as quickly as possible.
   3. Where wiring is involved, new wires shall be “pulled-in” between the nearest available accessible reused outlets to the extent allowed by the governing code.
   4. Furnish and install new conduits for wires if they cannot be “pulled-in” to existing conduits.
   5. All new conduits, wiring, and electrical items shall be connected to the existing systems so as to function as a complete unit.
   6. Where existing electrical equipment, devices, fixtures, electrically operated items, etc., interfere with any remodeling work, they shall be removed and reinstalled in another location to avoid such interferences. All existing and relocated equipment shall be left in good operating condition.

B. CONTRACTOR shall remove all conduit and wiring associated with items specified herein and/or shown on the drawings to be removed.

C. Include in Bid removal of existing electrical material and equipment as specified hereinafter, as noted on the drawings, or as needed by field conditions.

D. Seal or cap all existing conduit penetrations not being reused.

END OF SECTION

SECTION 16110

CONDUIT

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
1. Rigid aluminum conduit.
2. PVC externally and internally coated galvanized rigid metal conduit.
3. Electrical metallic tubing.
4. Polyvinyl chloride conduit and fittings.
5. Liquidtight flexible metal conduit and fittings.
6. Conduit seals and special fittings.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 REFERENCES

A. ANSI C80.3-Electrical Metallic Tubing.

B. ANSI C80.5–Rigid Aluminum Conduit.

C. ANSI/NEMA FB 1–Fittings and Supports for Conduit and Cable Assemblies.

D. NEMA RN 1–PVC Externally and Internally Coated Galvanized Rigid Steel Conduit.

1.03 QUALITY ASSURANCE

A. Manufacturers of Raceways: Firms regularly engaged in the manufacture of electrical raceways of the types and capacities required whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer: A firm with at least 5 years of successful installation experience on projects with electrical wiring installation work similar to that for the project.

C. Code Compliance: Comply with National Electrical Code (NFPA 70) and any and all local codes as applicable to construction and installation of electrical wiring devices, material, and equipment herein specified.

D. UL Labels: Provide electrical cable, raceways, wire, connectors, etc., which have been listed and labeled by Underwriters Laboratories.

E. Prior to shipment to the site, all conduit provided shall be new, unused material, and may not have been stored outdoors or exposed to weather.

F. NECA Standard: Comply with applicable portions of National Electrical Contractor's Association's "Standard of Installation."

1.04 SUBMITTALS

A. Submit shop drawings and product data in accordance with provisions of Section 01300-Submittals.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Provide color-coded thread protectors on the exposed threads of threaded rigid metal conduit.

B. Handle conduit carefully to prevent end damage and to avoid scoring the finish.

C. Store conduit inside and protect from weather. When necessary to store outdoors, elevate well above-grade and enclose with durable, waterproof wrapping.

PART 2–PRODUCTS

2.01 RIGID METAL CONDUIT AND FITTINGS

A. Rigid Aluminum Conduit: ANSI C80.5. Heavy wall.

B. Conduit bodies for rigid aluminum conduit shall be as manufactured by Appleton, Form 85, or equal, and be constructed of pressure-cast, copper-free aluminum for sizes 2 inches and under, and sand-cast, copper-free aluminum for sizes over 2 inches. Conduit bodies shall have built-in pulling rollers, domed gasketed covers, and stainless steel screws. CONTRACTOR shall select body style and size per application.

C. PVC coated conduit and fittings shall be internally and externally hot dipped galvanized rigid metal conduit with hot dipped galvanized threads and PVC coating. PVC coating shall be UL listed with rigid metal conduit as the primary means of corrosion protection for the conduit, and PVC coating shall have an external 40 mil thickness with an internal 2 mil urethane coating. Acceptable manufacturers shall be Plasti-bond RedH_2OT by Robroy Industries, Ocal-Blue by Thomas & Betts, or equal. PVC coated conduit and fittings shall meet the following listings and manufacturing standards, without exception. All installers shall be field-certified from the factory for installation and shall provide proof of certification:
   1. Federal Specification WW-C-581 E.
   2. ANSI C80.1.
   3. UL6.
   4. NEMA RN-1.

D. Conduit bodies for PVC coated rigid conduit shall be as manufactured by Plasti-bond RedH_2OT by Robroy Industries, Ocal Blue by Thomas & Betts, or equal, and have a 40 mil PVC exterior coating and 2 mil red urethane interior coating. Conduit bodies shall be Form 7 style or pulling elbow and include pulling rollers, domed, gasketed covers and stainless steel screws. CONTRACTOR shall select body style and size per application.

E. Fittings and Conduit Bodies: ANSI/NEMA FB 1; threaded-type, material to match conduit.

F. Supports: One-hole or two-hole pipe straps may be used for surface-mounted conduit. Where one-hole straps are used, provide conduit clamp and back spacer. Where standoffs are required, provide pipe straps and supporting devices as specified in

Section 16190-Supporting Devices. Support material shall match that of the conduit type provided.

2.02 ELECTRICAL METALLIC TUBING (EMT) AND FITTINGS

A. Conduit: ANSI C80.3. Thin wall seamless tubing with hot-dipped galvanized coating. Maximum size 2 inches.

B. Fittings: Compression-type only.

C. Supports: Mineralac with nut and clamping bolt; one hole straps.

2.03 POLYVINYL CHLORIDE CONDUIT (PVC) AND FITTINGS

A. Conduit: Heavy wall rigid, Schedule 40, Schedule 80 where noted, UL listed for underground and aboveground applications. PVC conduit installed in exterior locations shall be UV resistant.

B. Conduit bodies for PVC conduit shall be as manufactured by Carlon, or equal, and be suitable for use with Schedule 40 or Schedule 80 PVC conduit. Conduit bodies shall have smooth hubs, textured lids, and foam-in-place gaskets. CONTRACTOR shall select body style and size per application.

C. Supports: Two hole nonmetallic clamps or conduit support straps may be used for surface-mounted conduit. Where standoffs are required, provide pipe straps and supporting devices as specified in Section 16190-Supporting Devices. Support material shall match that of the conduit type being provided.

2.04 LIQUIDTIGHT FLEXIBLE METAL CONDUIT AND FITTINGS

A. Conduit: Electro galvanized single-strip steel with PVC coating and integral grounding conductor. Liquidtight conduit installed in exterior locations shall be sunlight resistant.

B. Fittings: ANSI/NEMA FB 1.

2.05 CONDUIT SEALS AND SPECIAL FITTINGS

A. Conduit seals shall be duct sealing compound, OZ Gedney Type DUX, or equal.

B. Expansion Fittings: Crouse Hinds or Robroy type XJG, or equal, for rigid, IMC, or PVC-coated rigid conduit. Crouse Hinds, type XD, or equal for PVC conduit.

C. Expansion-deflection Fittings: O-Z type “DX”, Crouse Hinds, type XD (PVC conduit only), or Appleton.

D. Ground Bushings: Appleton, model GIB, or equal.

E. Watertight Hubs: Die-cast, insulated, and gasketed, rated for wet or dry locations, indoors or outdoors. Water tight hubs shall be Appleton HUB, Crouse-Hinds Myers Hubs, or equal.

F. Conduit Plugs: Kwik N Sure pipe plug as manufactured by Cherne Industries, or equal. Plug shall include natural rubber O-ring with galvanized wing nut and hex nut.

PART 3–EXECUTION

3.01 CONDUIT SIZING, ARRANGEMENT, AND SUPPORT

A. Size conduits for branch circuit conductors, control wires, and audio cables so as to have not less than 25% spare capacity after installation; 3/4 inch minimum size, unless otherwise noted. Minimum size for liquidtight flexible metal conduit is 1/2 inch.

B. Maintain at least 1 inch of separation between conduit sizes to 1 1/2 inches and 2 inches between conduits 1 1/2 inches or larger. Maintain 1 foot of separation between audio signal conduits (below 100 volts) and power conduits (100 volts and above).

C. All conduit shall be supported in accordance with the NEC and as specified herein. This shall apply to all conduit types, including flexible conduit.

D. Provide for the proper application, installation, and location of inserts, supports, and anchor bolts for a satisfactory raceway system. Where any component of the raceway system is damaged, replace or provide new raceway system.

E. Run conduits concealed to avoid adverse conditions such as heat and moisture, to permit drainage, and to avoid all materials and equipment of other trades. Maintain a minimum clearance of 6 inches from all hot water pipes, flues, or any high-temperature piping or duct work.

F. Conduits shall be attached to building surfaces and not suspended unless installed in a Unistrut type conduit rack as specified herein. Individual conduits shall not be suspended. Clevis hangers are not allowed.

G. Conduit attached to building surfaces which may be damp shall be spaced out to avoid rust and/or corrosion using fittings approved for the use. Use back-straps on all conduit in damp or wet locations or mount conduit with Unistrut straps, or equal. Watertight hubs shall be used in all damp locations. Damp locations shall include, but not be limited to, all areas below stadium seating, tunnel areas, exterior locations, all areas below grade, and any washdown areas.

H. Conduits shall be securely fastened to building structure at intervals not exceeding 8 feet or closer, if necessary. Where hangers are necessary, 3/8-inch rod/eyelets/rings/or trapeze-type in Unistrut channel and pipe clamps shall be used. Wire or perforated strap iron is not acceptable. PVC conduit shall be securely fastened to building structure at intervals not exceeding 3 feet.

3.02 GENERAL CONDUIT INSTALLATION REQUIREMENTS

A. Interior conduit shall be run concealed in building cavities and chases. Exterior conduit shall be buried below grade. Exposed conduit runs shall be avoided. Conduit may be run exposed only where it is impossible to conceal.

B. Run exposed conduit grouped and parallel or perpendicular to construction. Do not route exposed conduits over high-temperature machinery nor in contact with such equipment.

C. All conduit installed below grade shall be buried a minimum of 2 feet 0 inches. All conduit installed below grade within 10 feet of the athletic field playing surface shall be installed 4 feet 0 inches to accommodate future field playing surface elevation modifications.

D. PVC conduit installed in earth shall be bedded in compacted sand with a minimum of 6-inch cover on all sides.

E. Ream conduit smooth at ends, cap upon installation, rigidly attach to structural parts of the building, and securely fasten to all outlet boxes, panel cabinets, junction boxes, pull boxes, splicing chambers, and all other components of the raceway system.

F. Provide conduit raceway for exposed cables that are not UV resistant. This shall include, but not be limited to, loudspeaker wiring, etc.

G. Conduit seals shall be provided where conduits pass from the interior to exterior of the building.

H. Liquidtight flexible conduit shall be installed in such a manner that liquids tend to run off the surfaces and not drain toward the fittings.

I. All runs of liquidtight flexible conduit to equipment and devices shall be as short as practicable and with enough slack to reduce the effects of vibration to a minimum.

J. Provide conduit expansion-deflection fittings as specified herein, in all conduit runs where movement perpendicular to axis of conduit may be encountered.

K. Conduits shall be pitched so that drainage is towards handholes and away from all structures.

L. Conduit bends for PVC conduit shall be made using a hot box, heat blanket, or glycol bender. Open flame or point heat sources of any type are not allowed.

3.03 CONDUIT PENETRATIONS AND TERMINATIONS

A. Where fittings are brought into an enclosure with a knockout, a gasket assembly consisting of an O-ring and retainer shall be installed on the outside. Fittings shall be insulated throat-type.

B. Conduit penetrations for control panels or enclosures containing electronic equipment shall be made on the sides or bottom of the enclosure. Conduits shall not penetrate the top of the enclosure.

C. Provide conduit expansion fittings as specified herein, in all conduit runs that cross a structural expansion joint, and for conduits protruding from earth where the conduit is terminated within 5 feet of finished grade.

D. Provide firestopping for all conduits penetrating fire barriers as specified in Section 07270-Firestopping.

E. Where above-grade conduits pass through cores in existing structures, grout openings between conduit and walls or floors with sand-cement mortar.

F. Where wall penetrations through existing walls are below grade, cored openings shall be sealed with waterproof mechanical seals. Cores shall be pitched slightly, such that conduit slopes away from building. Sleeve diameter shall be provided and mechanical seals installed as recommended by the manufacturer.

3.04 CONDUIT INSTALLATION SCHEDULE

A. The following schedule lists specific conduit types allowed in designated areas. Those areas not listed under a specific conduit type shall not have that type of conduit installed:
   1. EMT: Interior partitions in the Press Box only.
   2. Rigid Aluminum:
      a. All exposed interior locations.
      b. Interior locations requiring mechanical protection.
      c. Exterior locations (except at the Press Box).
      d. All locations where attached to aluminum railings or aluminum structural members.
      e. Where noted on drawings.
      f. All conduit attached to light fixture poles.
   3. PVC coated rigid steel:
      a. Conduits protruding from concrete.
      b. Interior and exterior locations requiring mechanical protection.
      c. Earth.
      d. Exterior locations and locations exposed to weather.
      e. Within 6 feet of building or structure footing, wall or handhole.
   4. PVC:
      a. Earth, except within 6 feet of a building or structure footing, wall, or handhole penetration.
      b. Exposed exterior locations (Schedule 80) at the Press Box only.
      c. Bare copper grounding conductors.
   5. Liquidtight flexible metal conduit not over 3 feet in length for final connections to:
      a. Equipment with vibration isolation mounting.
      b. Equipment housing ferromagnetic cores including transformers.

END OF SECTION

SECTION 16112

HANDHOLES

PART 1–GENERAL

1.01 DESCRIPTION

A. Work Included: Precast polymer concrete handholes.

B. Related Sections: Applicable provisions of Division 1 shall govern work in this section.

1.02 REFERENCES

A. ANSI/SCTE 77-Specification for Underground Enclosure Integrity.

1.03 SUBMITTALS

A. Submit shop drawings and product data in accordance with provisions of Section 01300-Submittals.

B. Shop drawing submittals shall include manufacturer's technical information for handholes and accessories proposed for use.

PART 2–PRODUCTS

2.01 PRECAST POLYMER CONCRETE HANDHOLES

A. Material and Construction:
1. Precast polymer concrete.
2. Enclosures shall be UL listed.
3. Enclosures, boxes, and covers are required to conform to test provisions of ANSI/SCTE 77 for Tier 22 applications.
4. All covers are required to have a minimum coefficient of friction of 0.50 in accordance with ASTM C1028.
5. Covers shall have the following stamped logos:

   “ELECTRICAL” OR “COMMUNICATION”

6. Provide divided handholes to physically separate wiring where noted on the drawings.
7. Handholes shall be Hubbel, Quazite, PG-Style, or equal.

PART 3–EXECUTION

3.01 INSPECTION AND COORDINATION

A. Examine conditions under which the Work is to be installed and notify ENGINEER in writing of conditions detrimental to proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected.

B. Coordinate handhole installation with piping, and other underground systems and structures and locate clear of interferences.

3.02 INSTALLATION

A. Install handholes where shown and verify locations in field. Perform excavation and backfilling required for installation. Excavation and backfilling shall be per Section 16010-General Electrical Requirements.

B. Install handholes on a 3/4-inch crushed stone foundation 1 foot under all handholes and within 2 feet of exterior handholes. Handhole bases shall be set at the proper grade and carefully leveled and aligned.

C. All conduits must enter the sides of handholes. Conduits entering the bottom will not be permitted.

D. handholes shall be considered wet locations for purposes of equipment selection.

E. All conduits shall be pitched so that drainage is towards handhole and away from all structures.

3.03 GRADING AT HANDHOLES

A. Handholes in unpaved areas shall be built as shown to a rim elevation higher than the original ground. The ground surface shall be graded to drain away from the handhole. Fill shall be placed around handholes to the level of the upper rim of the handhole frame, and the surface evenly graded on a one- (vertical) to-ten (horizontal) slope to surrounding ground, unless otherwise shown. Coordinate slope with OWNER prior to installation.

B. CONTRACTOR shall be solely responsible for proper height of handholes necessary to reach final grade. ENGINEER’s review of Shop Drawings for handhole components is general in nature and CONTRACTOR shall provide random length precast handhole riser sections to adjust handholes to meet field conditions for final grading.

END OF SECTION

SECTION 16120

WIRE

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Wire.
   2. Terminal blocks and accessories.
   3. Wiring connections and terminations.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 QUALITY ASSURANCE

A. Manufacturers of Wire: Firms regularly engaged in the manufacture of electrical wire products of the types and ratings needed whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer: A firm with at least 5 years of successful installation experience on projects with electrical wiring installation work similar to that in this project.

C. Code Compliance: Comply with National Electrical Code (NFPA 70) and any and all local codes as applicable to construction and installation of electrical wiring devices, material, and equipment herein specified.

D. UL Labels: Provide electrical raceways, wire, connectors, etc., which have been listed and labeled by Underwriters Laboratories.

E. NECA Standard: Comply with applicable portions of National Electrical Contractor's Association's "Standard of Installation."

1.03 SUBMITTALS

A. Submit shop drawings and product data under the provisions of Section 01300–Submittals.

B. Submit manufacturer's instructions.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Provide factory-wrapped, waterproof, flexible-barrier material for covering wire on wood reels, where applicable, and weather-resistant fiberboard containers for factory-packaging of wire, connectors, outlets, boxes, lamps, fuses, etc., to protect against physical damage in transit. Do not install damaged wire or other material; remove from project site.

B. Store wire and other material in factory-installed coverings in a clean, dry, indoor space which provides protection against the weather.

PART 2–PRODUCTS

2.01 WIRE

A. All wire for permanent installation shall be new stranded copper delivered to project in unopened cartons or reels, except where specifically noted and be UL listed for the use intended. No wire smaller than 12 AWG shall be used unless specifically noted. The use of multiconductor cable is NOT ALLOWED.

B. Athletic field lighting system control wiring:
   1. Insulation type shall be THHN.
   2. Minimum size for lighting system control wiring shall be 14 AWG.

C. Refer to Section 16740–Athletic Field Sound Systems for audio signal cables and loudspeaker wiring.

D. Wiring in dry locations shall be THHN. Wiring in damp and wet locations shall be type XHHW-2. Damp and wet locations shall include, but not be limited to, exterior locations, unconditioned spaces, exterior buried conduits, and areas below stadium seating (except in the Fire Suppression Piping Room).

E. All available colors shall be used; however, green shall be used only for equipment grounds. Where color-coded wire in larger sizes is not available, one wrap of 1-inch-wide colored self-adhesive tape at each terminal end shall be used for identification. Initial phase color shall be used throughout the run, even for switch legs. Colors must meet code requirements for each class voltage. Do not duplicate colors, including neutral, on different voltages.

F. Color Coding:

	120/208/240 V	277/480 V
A Phase	Black	Brown
B Phase	Red	Orange
C Phase	Blue	Yellow
Neutral	White	Gray
Travelers	Yellow	Orange
Equipment Ground	Green	Green

G. Circuits 150 feet or over shall be sized for a maximum 2% voltage drop.

2.02 WIRING CONNECTIONS AND TERMINATIONS

A. Provide crimp type UL or ETL listed terminations for 6 AWG and smaller stranded conductor connections to electrical devices and equipment such as receptacles, and terminal strips. Crimp devices shall be Sta-con, or equal.

B. Provide insulated, **silicone-filled** spring wire connectors with plastic caps for 8 AWG conductors and smaller. Connectors shall be King Silicone-Filled Safety Connectors, or equal. Spring wire connectors shall only be allowed in junction or outlet boxes.

C. No splices will be allowed unless reviewed by OWNER. Where allowed, provide in-line splices for all conductor connections, 6 AWG and larger. Splice crimp component shall be Burndy copper compression splice long barrel, beveled entry, type YS, or equal. Splice shall be made with crimp tool by manufacturer that allows expanded conductor ranges. Splice insulation component shall be Raychem heavy-wall, low-voltage tubing, type WCSM, or equal.

2.03 TERMINAL BLOCKS AND ACCESSORIES

A. Terminal Blocks: ANSI/NEMA ICS 4: UL listed.

B. Manufacturer and Model Number: Phoenix Contract UK 5 N, or equal.

PART 3–EXECUTION

3.01 INSPECTION

A. Examine the areas and conditions under which the work is to be installed and notify CONTRACTOR of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.02 GENERAL WIRING METHODS

A. Install electrical wire and connectors in accordance with the manufacturer's written instructions; applicable requirements of the NEC, the National Electrical Contractors Association's "Standard of Installation"; and in accordance with recognized industry practices to ensure that products serve the intended functions. Use appropriate wiring methods and materials for the equipment or environment.

B. Stranded conductors shall be terminated using crimp-type devices specified herein. Conductors may not be wrapped around a terminal screw.

C. Place an equal number of conductors for each phase of a circuit in same raceway.

D. Torque conductor connections and terminations with calibrated torque wrench to manufacturer's recommended values. Provide permanent marking on lug, bolt, nut, or connection for conductors larger than 4 AWG.

E. Splice only in junction or outlet boxes. Splicing is not allowed in disconnects, handholes, distribution panels, etc. Avoid splices between terminals of interconnecting power and control wiring.

F. Spring wire connectors shall only be used in junction, outlet, or switch boxes. Equipment wireways, control panels, and equipment racks shall not have any spring-wire connectors installed; all terminations shall be on terminal strips.

G. Neatly train, lace, and tie-wrap all wiring inside boxes, control panels, and equipment racks.

H. Make conductor lengths for parallel circuits equal.

I. The same color shall be used for each numbered wire throughout its entire length.

J. Terminate all wiring on terminal blocks in control panels, equipment racks, and similar equipment. This shall include all spare or unused wires.

K. Provide preprinted adhesive or heat shrink-type wire numbering labels at all terminations and splices. Wire numbering preprinted on the conductor, flag-type labels, and individual wraparound numbers (e.g., Brady labels) are not acceptable.

L. Provide a dedicated neutral for each branch circuit or feeder requiring a neutral. Ampacity of neutral conductor shall match that of the branch circuit or feeder.

M. Do not use a pulling means which can damage the raceway.

N. Audio signal wiring must be in a conduit separate from power and/or control wiring.

O. Provide junction or pull boxes to facilitate the “pulling in” of wires or to make necessary connections. All raceways and apparatus shall be thoroughly blown out and cleaned of foreign matter prior to pulling in wires.

P. Thoroughly clean wires before installing lugs and connectors.

Q. Make splices, taps, and terminations to carry full capacity of conductors without perceptible temperature rise.

R. Terminate spare conductors within equipment racks, control panels, etc., on terminal strips and label as “SPARE.” Spare wiring in pull or junction boxes may be terminated with electrical tape and labeled as “SPARE.” All spare conductor labels shall indicate where the conductors terminate. Refer to Section 16195-Electrical Identification, for additional requirements.

3.03 GENERAL LOW-VOLTAGE WIRING METHODS (LESS THAN 100 VOLTS)

A. Low-voltage wiring installation requirements specified herein shall be applicable to all systems installed that utilize low-voltage wiring where such wiring installation is not specified in other technical sections.

B. All low-voltage wiring shall be installed in conduit.

C. Low-voltage cable splices are not allowed.

3.04 WIRING INSTALLATION IN RACEWAYS

A. Pull all conductors into a raceway at the same time.

B. Install wire in raceway after all mechanical work likely to injure conductors has been completed.

C. Completely and thoroughly swab raceway system before installing conductors.

D. Conductors No. 6 AWG and larger shall be pulled in to conduits utilizing a tugger with built-in tension meter. CONTRACTOR shall provide a report to OWNER for each pull indicating maximum tension reached during the pull along with manufacturer's maximum pulling tension. Motorized machines of any type are NOT ALLOWED for any wire pulling.

E. Conductors shall be installed in conduit system in such a manner that insulation is not damaged, conductors are not overstressed in pulling, and walls are not damaged. No splices are permitted except in junction boxes or outlet boxes.

F. Panel riser feeder conductors shall be identified with colored tape at panel lugs. The same phase relation shall be maintained throughout.

G. Circuiting is indicated diagrammatically on the drawings.

3.05 FIELD QUALITY CONTROL

A. Inspect wire for physical damage and proper connection.

B. Prior to energizing, check conduit, raceways, outlet boxes, and wire for continuity of circuitry and for short circuits. Correct malfunction when detected.

C. Subsequent to wire hook-ups, energize circuitry and demonstrate functioning in accordance with these specifications.

D. Perform continuity test on all power and equipment branch circuit conductors. Verify proper phasing connections.

E. Perform field inspection and testing according to provisions of this section.

3.06 ACCEPTANCE TESTS

A. CONTRACTOR shall furnish all materials, labor, and equipment necessary for the acceptance tests specified herein. Acceptance tests shall be performed in the presence of OWNER or OWNER's representative and must be passed before final acceptance of the work.

B. CONTRACTOR shall be responsible for powered tests of each field-installed device unless specifically noted otherwise. CONTRACTOR shall be responsible for device operation as powered from its power source and signals as received at the I/O modules.

C. Operation Test: By operational testing, OWNER will give final acceptance of the wiring system when all of the wiring is considered a complete system. All equipment shall function and operate in the proper manner as indicated in the details of the specifications and on the drawings. All motors shall be properly connected to protective devices, and motor rotation shall be in the correct direction.

D. Individually test 600-volt light fixture branch circuit conductors for insulation resistance between phases and from each phase to ground. Test with a Megger whose rating is suitable for the tested circuit after cables are installed and before they are put into service. Tests shall meet the applicable specifications of ICEA S-95-658 and NEMA WC70. Tests shall be witnessed by OWNER. The insulation resistance for any given conductor shall not be less than the value recommended by the ICEA, or a minimum of one megohm for 600

volt and less service, if not ICEA listed. Any cable not conforming to the recommended value, or that fails when tested under full load conditions, shall be replaced with a new cable for the full length.

E. A written record of performance tests on electrical and control systems and equipment shall be supplied to OWNER. Such tests shall show compliance with governing codes.

3.07 WIRE INSTALLATION SCHEDULE

A. Install all wiring in raceways except as otherwise noted. This includes all low-voltage wiring such as audio signal cables and loudspeaker wiring.

END OF SECTION

SECTION 16130

BOXES

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Wall outlet boxes.
   2. Pull and junction boxes.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 REFERENCES

A. ANSI/NEMA OS 1–Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.

B. ANSI/NEMA OS 2–Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.

C. NEMA 250–Enclosures for Electrical Equipment (1000 Volts Maximum).

1.03 QUALITY ASSURANCE

A. Manufacturers of boxes, lamps, fuses, lugs, etc.: Firms regularly engaged in the manufacture of these products, of the types and ratings required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer: A firm with at least 5 years of successful installation experience on projects with electrical wiring installation work similar to that in this project.

C. Code Compliance: Comply with National Electrical Code (NFPA 70) and any and all local codes as applicable to construction and installation of electrical wiring devices, material, and equipment herein specified.

D. UL Labels: Provide electrical cable, boxes, raceways, wire, connectors, etc., which have been listed and labeled by Underwriters Laboratories.

E. NECA Standard: Comply with applicable portions of National Electrical Contractor's Association's "Standard of Installation."

1.04 SUBMITTALS

A. Submit shop drawings and product data in accordance with provisions of Section 01300-Submittals.

PART 2–PRODUCTS

2.01 OUTLET AND SMALL JUNCTION BOXES

A. Cast Boxes: Aluminum or cast feraloy, deep-type, gasketed cover, threaded hubs, Crouse-Hinds FD Series, or equal.

B. NEMA 4X Boxes: Stainless steel, Crouse-Hinds FD Series, or equal, with proper cover and gasket.

2.02 PULL AND JUNCTION BOXES

A. Cast Boxes: NEMA 250; Type 4, flat-flanged, surface-mounted junction box, UL-listed as watertight. Cast aluminum or feraloy box and cover with ground flange, neoprene gasket, and stainless steel cover screws, Crouse-Hinds WCB Series, or equal.

B. NEMA 4X Boxes: Stainless steel, Hoffman, or equal with proper cover and gasket.

C. Boxes Larger Than 12 inches in any dimension shall have a continuous hinge.

D. Boxes specified in this section are not allowed to have knockouts.

PART 3–EXECUTION

3.01 COORDINATION OF BOX LOCATIONS

A. Provide electrical boxes as shown on drawings and as necessary for splices, taps, wire pulling, cable bending radii, equipment connections, and code compliance.

B. Electrical box locations shown on drawings are approximate. Verify location and size of floor boxes and outlet boxes in all work areas prior to rough-in.

C. Where dedicated raceways are provided for different voltage systems or wiring, (e.g., power wiring and audio signal cables), separate boxes shall also be provided unless approved by OWNER. Where approved by OWNER, combined boxes shall be physically divided to separate the wiring.

D. Locate and install boxes to allow access. Where installation is inaccessible, coordinate locations and sizes of access doors.

E. Locate and install to present a neat appearance.

F. All boxes attached to building surfaces which may be damp shall be spaced out to avoid rust and/or corrosion. All boxes in damp locations shall be on 1-inch standoffs. Damp locations shall include, but not be limited to, areas below stadium seating, tunnel areas, exterior locations, all areas below grade, and any washdown areas.

3.02 OUTLET BOX INSTALLATION

A. Provide knockout closures for unused openings.

B. Support boxes independently of conduit.

C. Outlet boxes provided for branch circuits shall not contain audio signal cables.

D. Align wall-mounted outlet boxes.

E. All exterior outlet boxes shall be NEMA 4X.

F. All interior exposed outlet boxes shall be cast boxes, unless otherwise noted.

G. Knockout punches or saws shall be used for holes; boxes with prepunched holes are not acceptable, except when used in conjunction with EMT conduit in areas where allowed.

H. Boxes shall be of a depth to accommodate wires and splices.

I. Cast boxes with 3/4-inch hubs and aluminum fittings and enclosures may be used with all conduit types.

3.03 PULL AND JUNCTION BOX INSTALLATION

A. Locate pull boxes and junction boxes in unfinished areas.

B. Support pull and junction boxes independent of conduit.

C. Knockout punches or saws shall be used for holes; boxes with prepunched holes are not acceptable except when used in conjunction with EMT conduit in areas where allowed.

D. All junction boxes shall be labeled with permanent labels (not adhesive type). Permanent labels shall include painted stencil-type labels or engraved laminated nameplates. Labels shall indicate circuit or load served, as well as power source.

E. All interior exposed junction and pull boxes shall be cast-type with cover, unless noted otherwise.

F. All exterior junction and pull boxes shall be NEMA 4X. Boxes in areas subject to damage shall be stainless steel, or where noted to be stainless steel on the drawings.

END OF SECTION

SECTION 16190

SUPPORTING DEVICES

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Conduit and equipment support members.
   2. Fastening hardware.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 QUALITY ASSURANCE

A. Support systems shall be adequate for weight of equipment and conduit, including wiring, which they carry.

1.03 SUBMITTALS

A. Submit shop drawings and product data in accordance with provisions of Section 01300-Submittals.

PART 2–PRODUCTS

2.01 MATERIAL

A. Support Members:
   1. 316 stainless steel, fiberglass, or PVC in exterior locations.
   2. Galvanized steel in all other areas.

B. Hardware:
   1. Stainless steel in exterior locations.
   2. Galvanized steel in all other areas.
   3. Loudspeaker safety cables shall be stainless steel with minimum 110 lb working-load-limit, as manufactured by Suncor Stainless, or equal.

C. Manufacturers: Unistrut P-1000, B-line, Superstrut, or equal.

PART 3–EXECUTION

3.01 INSTALLATION

A. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using expansion anchors or support members. Do not use spring steel clips and clamps. Provide standoffs as specified in other technical sections.

B. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; and self-drilling anchors or expansion anchors on concrete surfaces.

C. Where support members are used for conduit, cutoff ends shall be ground smooth.

D. Do not fasten supports to piping, ductwork, mechanical equipment, or conduit.

E. Do not use powder-actuated anchors.

F. Do not drill structural steel members.

G. Fabricate supports with welded end caps and all welds and surfaces ground smooth for neat appearance. Use hexagon head bolts with steel spring-lock washers under all nuts.

H. Install surface-mounted equipment racks and control panels with minimum of four anchors.

I. Do not use chain hangers.

J. All welds shall be continuous and ground smooth.

K. Provide stainless steel safety cables for each loudspeaker. Cables shall support the entire weight of the loudspeaker if the mounting hardware fails.

END OF SECTION

SECTION 16195

ELECTRICAL IDENTIFICATION

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Nameplates.
   2. Wire markers.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 SUBMITTALS

A. Submit shop drawings and product data in accordance with provisions of Section 01300-Submittals.

B. Provide schedule for nameplates and labeling tags with shop drawings. Reference drawings for type used.

PART 2–PRODUCTS

2.01 NAMEPLATES

A. Type “A”:
   1. Use:
      a. Each circuit breaker in the lighting system distribution panel.
      b. Cabinets, enclosures, equipment racks, and junction boxes.
   2. Size: 2 inch by 3 inch.
   3. Material: 3-layer laminated Micarta.
   4. Background Color: Black.
   5. Character Color: White.
   6. Character Size: 1/4 inch.
   7. Engraving: As requested by OWNER.
   8. Mounting Location: Front exterior.

B. Type “B”:
   1. Use: Lighting Control Panel.
   2. Size: 4 inch by 4 inch.
   3. Material: 3-layer laminated Micarta.
   4. Background Color: Black.
   5. Character Color: White.
   6. Character Size: 2 1/4 inch.
   7. Engraving: “Athletic Field Lighting Control Panel.”
   8. Mounting Location: Top of Panel.

C. Type “C”:
   1. Use: Audio system devices; above audio equipment control knobs, and audio jack faceplates.
   2. Size: 3/8 inch by 2 inch.
   3. Material: 3-layer laminated Micarta.
   4. Background Color: Black.
   5. Character Color: White.
   6. Character Size: 1/8 inch.
   7. Engraving: As requested by OWNER.
   8. Mounting Location: Device front at top.

2.02 WIRE MARKERS

A. Wire markers shall be permanently attached sleeve or heat shrink-type labels. Wire numbering preprinted on the conductor, flag-type labels, and individual wraparound numbers (such as Brady preprinted markers) are not acceptable. All wire markers shall be the same throughout the project.

B. Wire markers shall be specifically printed for this project using permanently attached computerized adhesive tags, such as Brady IDXPERT labeling printer with self-laminating vinyl, permasleeve heat-shrink polyolefin, or equal. Handwritten markers are not acceptable.

PART 3–EXECUTION

3.01 INSTALLATION

A. Degrease and clean surfaces to receive nameplates.

B. Install nameplates parallel to equipment lines.

C. Affix nameplates with stickyback adhesive.

D. Prepare and install neatly-typed directions in all panels, including existing panels where work is done under this Contract.

3.02 WIRE IDENTIFICATION

A. Provide wire markers on each conductor, including neutral and spare conductors, in distribution panels, control panels, equipment racks, pull boxes, outlet and junction boxes, and at load connection. Identify with branch circuit or feeder number for power and lighting circuits, and with control wire or audio cable number as indicated on schematic and interconnection diagrams. Spare conductors shall have control wire number or shall indicate termination point of wire.

B. Conductors in pull boxes, distribution panels, control panels, cabinets, and panelboards shall be grouped as to circuits and arranged in a neat manner. All conductors of a feeder or branch circuit shall be grouped, bound together with nylon ties, and identified. Phase identification shall be consistent throughout the system.

END OF SECTION

SECTION 16450

SECONDARY GROUNDING

PART 1–GENERAL

1.01 SUMMARY

A. Work Included:
   1. Light fixture pole and lighting distribution panel grounding.
   2. Electrical equipment and raceway grounding and bonding.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

1.02 SUBMITTALS

A. Indicate location of system grounding electrode connections and routing of grounding electrode conductor.

B. Submit shop drawings and product data in accordance with provisions of Section 01300-Submittals.

PART 2–PRODUCTS

2.01 MATERIALS

A. Ground Rods: Copper bonded, 5/8-inch diameter; minimum length 10 feet.

B. Ground Connections Below Grade: Exothermic-type Cadweld, Thomas & Betts compression-type, or equal. Compression connectors shall be prefilled with an oxide inhibitor.

C. Ground Fittings: O-Z/Gedney, Type ABG, CG, TG, KG, GBL, or equal.

PART 3–EXECUTION

3.01 INSTALLATION

A. Compression-type connectors shall be installed with the manufacturer recommended tools. Compression dies shall emboss index on the connector when installed correctly. An indenter crimp shall be made on ground rods prior to connection of grounding conductor.

B. Provide a separate insulated equipment grounding conductor for each feeder and branch circuit. Provide a dedicated neutral conductor sized to match the circuit or feeder conductors for each feeder, or branch circuit requiring a neutral. Terminate each end on a grounding lug, bus, or bushing. Provide additional ground conductor for isolated-ground type receptacles.

C. Bond together system neutrals, service equipment enclosures, equipment racks, exposed noncurrent carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, and receptacle ground connectors.

D. Connect grounding electrode conductors to light fixture poles and electrical component enclosures using suitable ground clamps.

E. Ground system, transformer neutrals and equipment as required by code and local ordinances.

F. All bare copper conductors installed outdoors shall be buried a minimum of 2 feet below grade.

G. A minimum of one ground rod near each of the new light fixture poles shall be provided as shown on the drawings. Provide minimum three ground rods at 15-foot separations where shown on the drawings for connection to the existing lighting system distribution panel using a ground rod bonding conductor sized to code requirements. The above are minimum requirements.

H. Include ground for grounded receptacles, isolated-ground type receptacles, light fixtures, sound system equipment racks, and equipment items shown on the drawings.

I. Flexible connections do not qualify for ground. All flexible connections must have separate green ground wire from equipment frame to conduit system.

J. All equipment in NEMA 4X areas that are fed from circuits in PVC conduit shall be provided with a separate green ground wire that is terminated at the metallic conduit system and the equipment.

K. Separately derived systems as defined by the National Electrical Code shall be grounded as such.

3.02 TESTING

A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

B. Provide ground system resistance test report for the lighting distribution panel ground grid. Test report shall document ground system resistance following the three-point “fall of potential” test. The test results shall include a graph of the results plus a diagram of the testing layout. The remote current probe (C2) shall be placed a minimum of 100 feet from the ground system potential/current probe (P1/C1), or as required to provide sufficient spacing to demonstrate a resistance plateau on the graph. The ground resistance shall be tested with the potential probe (P2) between the P1/C1 probe and the C2 probe at 10% intervals starting at 0% and ending at 100% of the distance between P1/C1 and C2, 11 points total. A single point of measurement is not acceptable, and the two-point method of ground system testing shall only be used where there is no or insufficient "open earth" area to use the three-point Fall-of-Potential method. Resistance at any point in the grounding system shall not exceed 5 ohms. All ground system tests shall be witnessed by OWNER.

C. The test meter shall be Associated Research Vibroground test set with null balance, James A. Biddle Megger Earth-Tester-Null Balance, or equal. All ground system tests shall

be performed in accordance with the procedures outlined in the instruction manuals of the ground system test report.

D. In lieu of testing the ground grid as a system, CONTRACTOR may choose to test individual ground rods separately. Individual ground rods when tested separately shall be isolated from all metallic connections, such as from the ground rod to other grounded structures and electrical system neutrals.

E. Multiple ground rod grids shall be isolated from all metallic connections such as from grid under test to other grounded structures and electrical system neutrals.

F. Provide test report using the attached Form 16450.

END OF SECTION

FORM 16450

GROUND ROD RESISTANCE TO EARTH TEST RECORD

1. DATE _____

2. PROJECT NAME _____

3. LOCATION OF TEST _____

4. DRAWING NO. _____

5. GROUND ROD TYPE _____

   DIAMETER _____

   LENGTH _____

6. TEST METHOD _____

   INSTRUMENT TYPE _____

   SERIAL NO. _____

7. REQUIRED MAXIMUM RESISTANCE TO EARTH _____

8. MEASURED RESISTANCE TO EARTH ROD 1 _____

   ROD 2 _____

   ROD 3 _____

   GROUND ROD SYSTEM _____

TEST PERFORMED BY: _____
Signature

TEST WITNESSED BY: _____
Signature

SECTION 16540

ATHLETIC FIELD LIGHTING

PART 1–GENERAL

1.01 SUMMARY

A. Provide a fully functional athletic field lighting system for Breese Stevens Athletic Field in the City of Madison, Wisconsin. The lighting system shall be comprised of all necessary components including, but not limited to, poles, luminaires, ballasts, and lighting control panel.

1.02 PRESUBMITTAL REQUIREMENTS

A. The drawings and specifications were prepared based on MUSCO's Light-Structure Green system. A Qualite Sports Lighting system utilizing the manufacturer's International Visored Fixture may be submitted as a substitute for review. A complete substitute submittal shall be provided for approval as specified herein. If the substitute system is approved, CONTRACTOR shall be responsible for all costs associated with any changes required to accommodate the substitute equipment including, but not limited to, structural, electrical, and site work. CONTRACTOR shall also pay additional costs necessary for revisions of drawings and/or specifications by OWNER's engineer.

B. Substitute submittals shall be submitted with adequate time to provide a resubmittal for the MUSCO Light-Structure Green system if the substitute equipment is not approved.

1.03 SUBMITTALS

A. The following information shall be submitted for review:
   1. Layout Drawing: Showing number of luminaries and EPA per pole, number of poles, pole locations, and associated mounting heights.
   2. Photometric Data: A photometric report in IES format by Independent Testing Laboratories for each NEMA type of reflector to be utilized in this project.
   3. Lighting Structure Drawing: A mechanical drawing of the lighting structure.
   4. Computer Photometric Models–Field Light Values:
      a. Manufacturer shall submit computer-generated photometric layouts meeting the criteria specified in Section 1.05.A.1.a. The illumination levels shall consist of target points located 3 feet 0 inches above finished grade and equally spaced on a 10-foot by 10-foot grid extending 10 feet north and south of each sideline (touch line) and 40 feet east and west of each endline (goal line).
      b. Manufacturer shall submit in writing a letter guaranteeing initial light levels, maximum to minimum ratio and total kilowatt consumption for the lighting system.
   5. Lighting control system controller cutsheets including NEMA rating, dimensions, and wiring diagrams.
   6. Lighting Structure Warranty: Written from the manufacturer covering the lighting structure equipment replacement policy and aiming alignment of the luminaire assembly.
   7. Wind Load Test: Provide wind load test results for the luminaire assembly certified by an independent structural engineer to withstand minimum 90 MPH winds.
   8. Manufacturer shall submit 25-year life cycle cost calculations. Life cycle cost shall be for the complete lighting system. Include material and labor costs for all equipment

replacements anticipated after the warranty period expires, and include component useful life expectancy.

9. UL Test Report: Provide a copy of the Underwriter's Laboratory report covering the lighting structure.
10. Corrosive Protection: Provide Manufacturer's certification that all latches, fasteners, and hinges are of stainless steel construction; all aluminum materials are anodized and all steel is hot-dipped galvanized to ASTM 123 standards.
11. Letter of Compliance: A written itemized statement of any exceptions to these specifications.

1.04 QUALITY ASSURANCE

A. UL Listing: The entire lighting structure shall be UL listed as a system in addition to using UL listed components.

B. Manufacturer shall be responsible for on-site delivery within 4-6 weeks from receipt of approved submittals and receipt of complete order information.

C. Factory-Trained Representative: Lighting manufacturer shall provide a factory-trained representative to be available as required. This representative shall also perform light test and summary report prior to final acceptance of project.

1.05 WARRANTY

A. Manufacturer shall warrant in writing the entire structure (excluding fuses and lamps) to be free from defects in materials and workmanship for a period of 25 years or 10,000 operating hours starting from the date of delivery.

B. Manufacturer shall warrant in writing to provide labor and materials to replace defective parts or repair defects in workmanship for a period of at least 25 years or minimum 10,000 operating hours from the date of delivery.

C. Lamps shall be warranted by the manufacturer in writing not to fail for a period of at least 25 years or minimum 10,000 operating hours from the date of delivery.

D. Manufacturer shall warrant in writing accurate alignment of the luminaires on the luminaire assembly field lighting levels and spill light control field for a period of at least 25 years or minimum 10,000 operating hours from the date of delivery.

E. Manufacturer shall include in the warranty all material and labor costs to perform group relamping of all lighting at 5,000 operating hours of operation, including lamps replaced prior to the 5,000 operating hours.

F. If manufacturer takes exception to the 25 year warranty, provide complete relamping and individual lamp replacement costs including labor.

1.06 SYSTEM DESCRIPTION

A. The manufacturer shall supply lighting equipment to meet or exceed the following performance criteria:
   1. Athletic Field Lighting:
      a. Performance Criteria:

Playing Field Type	IESNA Class of Play	Minimum Average Maintained Footcandles	Maximum to Minimum Uniformity Ratio
Soccer	2	50	2.5:1.0

      b. Performance Requirements: Playing surface shall be lit to an average constant light level and uniformity as specified in the table above. Light levels shall meet or exceed the specified performance criteria for 25 years. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified herein. Measured average illumination level shall be ±10% of predicted mean in accordance with IESNA RP-6-01, and measured at the first 100 hours of operation.
   2. Spill Light Control: Maximum horizontal footcandles at a distance of 120 feet from the playing field perimeter shall not exceed 0.5 foot-candles north of the stadium and shall otherwise not exceed 1.0 foot-candles. Footcandle readings shall be taken at 30 feet intervals along the specified line.

PART 2–PRODUCTS

2.01 LIGHTING STRUCTURE MATERIAL AND ASSEMBLIES

A. There are eight existing lighting structures consisting of 5 80-foot poles and three 80-foot truss towers. One of the existing poles is used for both lighting and cellular antennas. The new light fixtures assemblies and electrical component enclosures shall be mounted on the existing poles. Manufacturer shall provide all cross-arm assemblies required to mount new fixtures to existing pole tops. Provide three new 80-foot poles to replace the existing truss towers. New poles shall be mounted on existing truss tower concrete piers using new CONTRACTOR provided base plates with leveling anchor bolts. Lighting manufacturer will be responsible to coordinate with and review structural modifications to the existing bases to support new poles. The new poles shall be steel as specified below with new pole-top luminaire assembly, wire harness, and electrical component enclosure. All wiring shall be able to be routed inside the pole. The light fixtures assemblies shall be powered with a 480-volt, 3-phase, 3-wire electrical system.

B. Structural Steel and Foundation Design:
   1. Support Structure Wind Load Strength: Poles and other support structures, brackets, arms, and anchorages shall be determined based on the 2006 edition of the IBC Building Code, wind speed of 90 mph, exposure category C. Luminaire, visor, and crossarm shall withstand 150 mph winds and maintain luminaire aiming alignment.
   2. The strength of the materials used in the structures shall be calculated based upon AASHTO pole structure criteria.
   3. The poles shall be steel meeting ASTM-A595 Standards, and shall be hot-dip galvanized inside and out to the most current ASTM-123 standards. Provide vibration dampeners within poles.

4. All structural steel materials, including pole, crossarms, braces and hubs shall be hot-dipped galvanized to ASTM 123 standards.
5. The stress analysis and safety factor of the poles shall conform to AASHTO 2001 (LTS-4) pole structure criteria.

C. Aluminum Components: Provide high purity reflector grade aluminum. All other aluminum components shall be heavy anodized to AAC12A41 specifications and shall also be coated with an epoxy primer and heavy polyurethane enamel finish.

D. Stainless Steel Devices: All fasteners, latches, hinges and threaded devices shall be stainless steel construction.

E. Pole P1 Conduit Entry: Provide a 1-inch threaded conduit hub at base of pole for branch circuit conduit from adjacent junction box next to base. Coordinate location with CONTRACTOR.

F. General Electrical Requirements: Each lighting structure shall be equipped with a complete electrical system that includes the following:
1. Electrical Component Enclosure (ECE).
2. Manufacturer shall provide all branch circuits complete from the disconnecting device to the lamp with plug-in or landing lug connections for field installation. Electrical equipment on the pole shall be in conformance with UL standards.
3. The pole top luminaire assembly shall be completely wired, by the manufacturer providing the warranty, to a plug-in connection. All individual lamp circuits shall be labeled consistent with a schematic provided on the inside of the electrical enclosure door. All electrical conductors shall be enclosed within new poles and steel raceways or equivalent on existing poles.
4. There shall be system and equipment grounding through the lighting structure for connection to ground rods and feeder circuits.

G. Pole Top Luminaire Assembly:
1. The pole top luminaire assembly shall be completely assembled in the factory and aimed to form a single photometric unit.
2. The knuckle assembly and lamp cone shall be constructed of steel or die cast aluminum. The knuckle assembly shall contain a silicone gasket to prevent leakage and a rubber bushing around the through-bolt to protect the wiring. Light fixtures shall have a positive repositioning device for each luminaire on the assembly. The device shall provide for automatic repositioning of the aiming after relamping.
3. The luminaires shall be attached to the crossarm with a minimum of two bolts. There shall be no penetrations of the top or sides of the crossarm. End caps shall be a water-tight continuous weld, hot dipped galvanized to ASTM-123 Standards. The maximum crossarm length shall be 60 inches.
4. The crossarm, reflector and its attachment to the pole shall structurally withstand winds of 125 MPH with a 1.3 gust factor without misalignment of any luminaire and without any damage to the crossarms or its components.

H. Electrical Component Enclosure (ECE):
1. All electrical components on the lighting structure, except lamps, shall be enclosed in a NEMA 3R rated gasketed enclosure mounted approximately 10 feet above grade, unless noted otherwise on the drawings.
2. The ECE shall be constructed of aluminum and coated with a thermally radiant polyester powder coat paint. Latches shall have padlocking hasp and staple.

3. ECE shall have landing lugs for the feeder circuit as a part of the disconnecting device.
4. ECE shall have fuse block for individual fusing for each load carrying conductor in each lamp circuit. (Neutral conductors shall not be fused).
5. The ECE shall be listed by UL for use with 90°C rated supply wire as suitable for use in wet locations.
6. Each ballast, capacitor, and fuse shall be labeled to identify the fixtures it services.
7. Individual fuses shall be provided for each ballast conductor except neutral conductor.
8. The access door shall be attached by a full-length stainless steel hinge and shall be secured when closed by lockable stainless steel latches.
9. Distribution terminal blocks shall be factory-wired from the breaker to the blocks. These blocks shall provide for termination of all ballast connection wiring.
10. All lamp supply circuits in the ECE shall be color-coded and labeled. They shall terminate into a UL recognized plug-in device for plug-in to the wiring harness.
11. Each enclosure shall be supplied with a grounding lug rigidly fastened to the enclosure, sized to accept up to a 2/0 conductor.
12. ECEs for new poles shall have pre-fabricated conductor pass-through hubs on the back of the enclosure for fixture wire-harness entry from the inside of the poles.
13. ECEs for existing poles P2, P3, P4, P5, and P8 shall not have conductor pass-through hubs on the back of the enclosures. Branch circuit conductors and the fixture wire-harness shall be routed in conduit to ECE. Fixture wiring harnesses shall be extended by minimum 50 feet for installation down inside of pole and out of pole base up to the ECE in conduit external to pole as shown on the drawings. Coordinate extended wire harnesses with CONTRACTOR prior to shipment to the site.
14. ECE shall have lightning protection as specified herein.
15. Provide wire harness for plug-in connections between the ECE and fixture assembly.

I. Lighting Control Panel and Monitoring System:
   1. The lighting control system shall be UL Listed (Industrial Control Equipment). Equipment shall comply with UL standards E33316, E139944, E204954, E311491, E132445, E325078, SA7004, and E337467.
   2. The lighting control manufacturer shall provide a factory assembled, wired, and tested control and monitoring cabinet. The cabinet shall have sufficient capacity to power and control all pole mounted light fixture assemblies at Breese Stevens Athletic Field.
      a. Provide a keyed manual Off-On-Auto Selector Switch for control of all light fixture assemblies on the control panel front door.
      b. Operating ambient temperature range: -20°C to 60°C.
      c. All electronic assemblies shall be mounted on panels to allow for easy field maintenance.
      d. The lighting controller cabinet enclosure shall be rated NEMA 4 with lockable cover, and shall contain all electronic equipment. Enclosures with prepunched knockouts are not allowed.
      e. Contactor Modules:
         (1) Contactors shall be UL listed for lighting applications. They shall be rated at full capacity and be electrically held.
         (2) Terminal blocks shall be provided for each contactor and shall be UL listed. When required, neutral blocks shall be provided next to the terminal blocks.
   3. Control panel shall accept a remote “On-Off” selector switch input to control all light fixtures when the control panel manual “Off-On-Auto” switch is in the Auto position. The remote “On-Off” selector switch shall be provided by CONTRACTOR in the Breese Stevens Athletic Field office as shown on the drawings. Control panel shall

have terminal strip to accept two #14 AWG conductors from remote “on-off” selector switch.

4. Contactor Modules:
    a. Contactors shall be UL listed for lighting applications. They shall be rated at full capacity, be electrically held, and utilize a 120-volt coil.
    b. Terminal blocks shall be provided for each contactor and shall be UL listed. 30 and 60 amp contactors shall be sized to accommodate 2/0-14 gauge wire.
5. Communication Equipment:
    a. Manufacturer shall be responsible for providing and maintaining a cellular communication link in order to modify schedules and receive reports. Communication system shall also indicate equipment failures and total operating hours for lamps.
    b. Owner shall be able to access the monitoring system remotely via a manufacturer maintained web-interface.
    c. The communication link shall be a TCP/IP-type connection with two-way real-time communications.
    d. Manufacturer shall include communication costs for operating the controls and monitoring system for minimum 25 years.
    e. Furnish remote-mounted cellular antenna for installation on the exterior of the building by CONTRACTOR. Furnish 75 feet of antenna cable and all required connectors for installation by CONTRACTOR.

J. Universal Lightning Protection:
1. All structures shall be equipped with lightning protection meeting established standards by NFPA 780 (National Fire Protection Association).
2. CONTRACTOR shall provide at least one copper-clad steel ground rod of not less than 3/4-inch in diameter and not less than 10 feet in length at each structure.
3. The ground rod shall be connected to the structure by a copper main down conductor. If the structure is greater than 75 feet above grade the conductor shall be not less than a No. 2/0 conductor.
4. The main down conductor shall extend from the base of the steel pole to the ground rod and shall be bonded to the steel pole and the equipment ground. All metal components on the pole shall be bonded to the pole.
5. All main down conductors and all bonding conductors shall maintain a horizontal or downward coursing path, free from “U” or “V” (down and backup) sockets.

PART 3–EXECUTION

3.01 START-UP AND TRAINING

A. The manufacturer shall supply factory-authorized representatives to start-up all equipment and demonstrate full compliance with this specification. They shall verify that all supplied components have been properly installed and connected.

B. CONTRACTOR shall provide a training session for up to three OWNER’s representatives for one normal workday (not including start-up) at a jobsite location determined by OWNER. The training session shall be conducted by a manufacturer’s qualified representative.

END OF SECTION

SECTION 16740

ATHLETIC FIELD SOUND SYSTEMS

PART 1–GENERAL

1.01 SUMMARY

A. Work Included: This section includes the Athletic Field Sound System.

B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

C. The drawings and specifications were prepared based on the equipment specified herein. CONTRACTOR shall include in the Bid and shall be responsible for the cost of any changes to accommodate other equipment including, but not limited to, structural and electrical work. CONTRACTOR shall also pay additional costs necessary for revisions of drawings and/or specifications by ENGINEER.

1.02 QUALITY ASSURANCE

A. Installer: A qualified sound system contractor shall be one that has a minimum of 10 years' experience with communication systems of the size and complexity as specified herein.

1.03 SUBMITTALS

A. Submit shop drawings and product data in accordance with provisions of Section 01300-Submittals.

B. Provide product data on all equipment specified herein, including, but not limited to loudspeakers, power amplifier, mixer, mixer input/output modules, power conditioner, wireless microphones, antennas, antenna splitter, power supplies, etc.

C. Provide point-to-point wiring diagrams showing wiring connections between all system components, equipment ratings, dimensions, and finishes for all proposed devices and equipment. Point-to-point wiring diagrams shall include manufacturer recommended maximum ampacity and equipment loading. Wiring diagram shall indicate point of origin or termination on each piece of equipment and labeling for each signal cable.

D. Provide amplifier load calculations. Wattage tap shall be listed for each loudspeaker on the point-to-point wiring diagrams.

1.04 AS-BUILT DRAWINGS

A. Record drawings shall include the location of all Athletic Field Sound System devices with their respective labels.

B. Upon completion of the work, and final acceptance, CONTRACTOR shall submit record drawings to OWNER under the provisions of Division 1.

1.05 OPERATION AND MAINTENANCE DATA

A. Submit manufacturer data sheets for all equipment installed.

B. Include operating, installation, and routine maintenance instructions.

C. Include the date of installation of which the system has been tested, adjusted, and is fully operational.

D. Include as-built point to point wiring diagrams showing wiring connections between all components.

E. Provide final 1/3-octave real-time frequency analysis test report.

1.06 DELIVERY, STORAGE, AND HOLDING

A. Store in a clean, dry space. Maintain factory wrapping or provide an additional plastic cover to protect units from dirt, water, construction debris, and traffic.

B. Handle in accordance with manufacturer's written instructions.

1.07 SYSTEM DESCRIPTION

A. The work includes furnishing, delivering, and placing into operation a complete Athletic Field Sound System as specified herein and shown on the drawings.

B. CONTRACTOR shall inspect all work. The Bid shall include everything necessary to obtain a complete installation operating in accordance with these specifications. All responsibility for this system ultimately lies with CONTRACTOR.

C. CONTRACTOR shall be responsible for the placing of circuits and making of electrical connections in accordance with the manufacturer-furnished drawings, instructions, and field supervision to ensure proper connection.

D. The intent of this specification is to require the furnishing and installation of a satisfactorily operational sound system as established by the capabilities of equipment specified herein. It is understood that the sound system shall be installed, oriented, balanced and phased, so as to assure satisfactory quality and level of reproduction reasonably uniform throughout each area. CONTRACTOR's work shall be continued until such time as the installation meets with OWNER's approval insofar as it is consistent with the capability of the equipment specified herein.

E. All device and wire/cable labeling shall be in accordance with Section 16195–Electrical Identification.

1.08 WARRANTY

A. CONTRACTOR shall guarantee all labor, parts, and installation for a period of 1 year from substantial completion or first beneficial use of the system.

B. Upon written notification of unacceptable work or warrantee request, CONTRACTOR shall provide qualified technicians and parts within 24 hours of notification.

PART 2–PRODUCTS

2.01 SOUND SYSTEM EQUIPMENT

A. Provide a complete sound system as specified herein and shown on the drawings. All sound system components shall be rack-mountable in a standard 19-inch rack.

B. The sound system shall consist of an audio distribution network to include all equipment specified herein and shown on the drawings.

C. Sound System Racks:
   1. Amplifier Rack/Cabinet:
      a. Size (HxWxD): 24 inches by 24 inches by 24 inches.
      b. Minimum Rack Units: 12.
      c. Cabinet shall be wall-mountable, lockable NEMA 12 painted steel with scratch-resistant glass window-type front door. Provide 2000 BTU/Hr air-conditioning unit, Hoffman Model T200216G100. Air conditioning unit shall be installed prior to delivery to the site. Air conditioner shall operate on 120 volts AC power and draw maximum 7 amps.
      d. Provide shelf for mounting signal isolator.
      e. Provide two 120-volt receptacles inside the rack; one for the air conditioner and one for the sound system equipment power conditioner.
         (1) Air conditioner receptacle shall be 125 volt NEMA 5-20R, industrial specification grade, straight blade, 3-wire duplex grounded outlet, one of the following: Cooper 5362, Leviton 5362, Pass and Seymour 5362-A. Provide Ivory coloring. Provide outlet box, stainless steel faceplate, and label on faceplate reading “A/C UNIT.”
         (2) Sound system equipment receptacle shall be isolated-ground type, 125 volt NEMA 5-20R, hospital grade, straight blade, 3-wire duplex outlet, Hubbell Model IG8300, or equal. Provide orange coloring. Provide outlet box, stainless steel faceplate, and label on faceplate reading “AUDIO EQMT.”
      f. Cabinet shall support minimum 200 lbs and provide front and rear access to all rack-mounted equipment.
      g. Rack/Cabinet shall be Hoffman PROTEK Model PTRW242424G2A, or equal.
   2. Press Box Rack/Cabinet:
      a. Size (HxWxD): 24 inches by 24 inches by 18 inches.
      b. Minimum Rack Units: 12.
      c. Cabinet shall be wall-mountable, lockable NEMA 1 painted steel with tinted and scratch-resistance glass window-type front door. Provide rack rails as required.
      d. Provide one 120-volt receptacle inside the rack for the sound system equipment power conditioner. Receptacle shall be 125 volt NEMA 5-20R, industrial specification grade, straight blade, 3-wire duplex grounded outlet, one of the following: Cooper 5362, Leviton 5362, Pass and Seymour 5362-A. Provide Ivory coloring. Provide outlet box and stainless steel faceplate.
      e. Cabinet shall be double-hinged to provide front and rear access to all rack-mounted equipment.
      f. Rack/Cabinet shall be Hoffman ACCESSPLUS II Model EWMW242418, or equal, with 120-volt 100 CFM fan kit, Hoffman Model EWMF2.

D. Audio Mixer:
   1. Audio mixers shall be provided as shown on the drawings Bogen Model VMIX, or equal.
   2. Frequency Response: ±1 dB (20 Hz to 20 kHz).
   3. UL listed.
   4. AC Input Voltage: 120 volts AC, 60 Hz.
   5. Output Regulation: 2 dB no load to full load.
   6. Provide all necessary hardware to mount audio mixers in rack-mount cabinet.
   7. Mixer volume control knobs shall be labeled with printed labels in accordance with Section 16195–Electrical Identification, designating the assigned input. Labels shall not obstruct the operation of the mixer or any indicator lights and controls.
   8. Mixers shall have eight inputs, an 11-segment LED output meter, treble and bass adjustment controls, master volume controls, and a power status indication LED.
   9. Mixers shall have at least four user-configurable prioritized input levels such that an audio signal can activate a higher priority input and mute and all other inputs.
   10. Mixer shall have a minimum of eight input/output expansion bays that accept input and output signal cards. Provide compatible input and output modules as required for the signals specified herein and shown on the drawings.

E. Power Amplifier:
   1. Amplifier shall be CSA listed.
   2. Amplifier shall be solid-state two-channel design with switch-mode power supply.
   3. Front panel control and indicators shall include the following:
      a. Two rotary volume control knobs, one per channel.
      b. On/off power switch.
      c. Backlit LCD display for programming setup with Sel/Enter, Prev/Up, and Next/Down buttons.
      d. Low input signal level green LED.
      e. -10dB and -20dB below clip indicator LED's.
      f. Ready status green LED.
      g. Red clipping indicator LED.
      h. High temperature red LEDs, one for each channel.
      i. Power on status blue LED.
   4. Rear panel control and indicators shall include the following:
      a. NEMA 5-15P AC line connector.
      b. Two 3-pin removable Phoenix-style connectors for balanced audio signal wiring, one per channel.
      c. Output connector terminal trip for balanced and mono audio signal wiring output connections.
      d. USB connector.
   5. Amplifier shall accept two balanced line-level audio signals up to +22 dBu. A single input channel shall be able to be used for both output channels.
   6. Amplifier shall have dual channel 70 V outputs capable of driving 800 watts each at less than 1% THD from 20 Hz to 20 kHz.
   7. Frequency response shall be +0/-1 dB from 20 Hz to 20 kHz at 1 watt into 4 ohms.
   8. Sensitivity shall be 1.4 V.
   9. Balanced input impedance shall be 10 kohms.
   10. Operating temperature shall be 0^{o}C to 40^{o}C at 95% relative humidity.
   11. Amplifier shall be protected against shorted, open, or mismatched loads; overloaded power supplies; excessive temperature; chain destruction phenomena; excessive output current, and input overload damage.

12. Loudspeaker outputs shall protect against input/output DC, excessive DC offsets, and turn-on/turn-off transients.
13. Amplifier shall have a proportional speed cooling fan with front to rear airflow.
14. Amplifier shall mount in 2 RU 19-inch rack space, maximum 12.25 inches deep.
15. Amplifier shall operate on 120 volts AC or 220-240 volts AC 50/60 Hz input power.
16. Maximum AC line current shall be 12 amps with a maximum idle power draw of 45 watts.
17. Amplifier shall have a 3-year transferable warranty.
18. Amplifier shall be Crown Model CDi 2000, or equal.

F. Signal Isolator:
1. Signal isolator shall utilize line-level radial-transformer based isolation.
2. Signal isolator shall have two 600 ohm balanced input and output channels with XLR connectors.
3. Frequency response shall be 10 Hz to 50 kHz (± 1dB).
4. Each signal isolator channel shall accept balanced line-level audio signals up to +21 dBu.
5. Signal isolator shall have 0.001% THD at 1 kHz for a +4 dBu output.
6. Enclosure shall be 14 gauge steel with baked enamel finish.
7. Signal isolator shall be passive and not require input power.
8. Signal isolator shall have a 3-year transferable warranty.
9. Signal isolator shall be Radial Engineering Model Twin-Iso, or equal.

G. Headphone Distribution Amplifier/Mixer:
1. Headphone amplifier/mixer shall have six separate internal amplifiers, one for each channel.
2. A main balanced line-level input shall be able to be routed to each channel's amplifier and channel specific aux inputs shall be able to be mixed with the main input signal.
3. Headphone amplifier/mixer shall have a front panel mounted power button with integral status LED and main input signal gain control knob. Each channel shall have the following front panel mounted controls and inputs:
    a. Left and right channel mute buttons.
    b. Signal level mixing control knob to adjust the output percentage of the main and aux input signals.
    c. Output gain control knob (0 to 6 dBu).
    d. Mono/Stereo control pushbutton.
    e. 1/4-inch TRS aux-input jack.
    f. 1/4-inch TRS output jack.
4. Headphone amplifier/mixer shall have the following rear panel connectors:
    a. Two 1/4-inch TRS outputs per channel.
    b. Balanced left and right channel 1/4-inch TRS and XLR main inputs.
    c. Balanced left and right channel 1/4-inch TRS and XLR main outputs.
5. Headphone amplifier/mixer shall mount in one RU 19-inch rack space.
6. Headphone amplifier/mixer shall operate on 120 volts AC or 220-240 volts AC 50/60 Hz input power.
7. Headphone amplifier/mixer shall operate on 120 volts AC 60 Hz power with a maximum power consumption of 45 watts.
8. Headphone amplifier/mixer shall be Alesis Model MultiMix 6 Cue, or equal.

H. Graphic Equalizer:
1. Equalizer shall have a single 31-band channel of 1/3 octave equalization.
2. Equalizer shall have selectable ±6 dB and ±12 dB input gain boost/cut nonconducive sliders per 1/3-octave band.
3. Bandwidth shall be 20 Hz to 20 kHz, +5/-1 dB.
4. Dynamic range shall be minimum 112 dB with a Signal-to-Noise ratio of 95 dB.
5. THD plus Noise shall be maximum 0.003%.
6. Equalizer shall have 1/4-inch TRS and XLR balanced audio signal input connectors.
7. Equalizer shall have 1/4-inch TRS and XLR balanced audio signal output connectors.
8. Equalizer shall have built in 50 Hz 12 dB per octave high-pass filter.
9. Equalizer shall accept balanced line-level audio signals up to +21 dBu.
10. Equalizer shall mount in 1 RU 19-inch rack space, maximum 6-inches deep.
11. Equalizer shall operate on 100 to 240 volt 50/60 Hz power with a maximum power consumption of 15 watts.
12. Equalizer shall have a 3-year transferable warranty.
13. Equalizer shall be dbx Model 131s, or equal.

I. Microphones and Accessories:
1. Desktop Microphone:
   a. Desktop microphone shall be a 500-ohm high-fidelity 16-inch fully-flexible gooseneck desktop microphone with angle and height adjustment.
   b. Frequency response shall be 100 Hz to 12 kHz.
   c. Sensitivity shall be -76 dB (± 3dB).
   d. Desktop microphone base shall be heavy zinc die-cast with push-to-talk and push-to-lock switches.
   e. Desktop microphone shall utilize a carotid pickup pattern.
   f. Integral cable shall be a 10-foot long potted 6-conductor (two shielded), including two wires for a normally open contact.
   g. Desktop microphone shall not require phantom power.
   h. Finish shall be matte black.
   i. Desktop microphone shall be Bogen Model DDU250, or equal.
2. Wireless Microphone Receivers:
   a. Receiver shall have 960 selectable frequencies across 24 MHz bandwidth with automatic frequency selection.
   b. Maximum output level shall be as follows:
      (1) XLR: -13 dBV into 600 ohm load.
      (2) 1/4-inch TRS: -2dBV into 3 kohm load.
   c. Receiver shall have automatic transmitter setup and microprocessor controlled directivity.
   d. Receiver shall have a multi-function backlit LCD, low battery indicator, and 0 to -25 dB volume control on the rear of the unit.
   e. Receiver shall have frequency and power lockouts.
   f. Receiver shall have 1 kohm 1/4-inch TRS and 200 ohm XLR outputs.
   g. Receiver shall have dual detachable 1/4 wave antennas and shall be compatible with a 1/2 wave antenna distribution amplifier.
   h. Receiver shall be powered with 12 volts DC from the antenna distribution amplifier.
   i. Receiver shall be Shure Model SLX4, or equal.
3. Wireless Microphone/Transmitter:
   a. Transmitter:
      (1) Operating frequency range shall be 470-782 MHz.
      (2) Transmitter shall have automatic setup and a 3-segment battery level meter and backlit LCD with timeout feature.

(3) Transmitter shall have frequency and power lockout.
(4) Transmitter shall be compatible with the wireless microphone receiver, microphone, and antenna distribution amplifier.
(5) Transmitter shall be Shure Model SLX2, or equal.

b. Microphone:
(1) Microphone shall have a cardioid polar pattern with 50 Hz to 15 kHz frequency response.
(2) Sensitivity shall be -54.5 dBV/Pa at 1 kHz.
(3) Microphone shall be compatible with the wireless microphone transmitter.
(4) Microphone shall be Shure Model SM58, or equal. Provide windscreen option A58WS-BK.

4. Wireless Receiver Antenna Distribution Amplifier:
a. Antenna distribution amplifier shall be a four-way active antenna splitter and power distribution system with external 12 volts DC power supply for the wireless microphone receivers.
b. Frequency range shall be 470 MHz to 952 MHz.
c. Impedance shall be 50 ohms.
d. RF output gain shall be -0.5 dB to 3 dB.
e. Operating temperature range shall be -7^{o}C to 49^{o}C.
f. Antenna distribution amplifier shall allow multiple receivers to utilize two antennas and amplify the RF signals to compensate for insertion loss.
g. Provide two compatible 1/2 wave omnidirectional antennas and compatible low-loss antenna cable. Antenna frequency range shall be 470-530 MHz.
h. Antenna distribution amplifier, antennas, and antenna cables shall be compatible with the wireless microphone transmitters.
i. Antenna distribution amplifier shall be Shure Model UA844SWB, or equal. Antenna's shall be Shure Model UA820G, or equal.

J. Loudspeakers:
1. Loudspeakers shall be compatible with a 70-volt constant voltage amplifier. Provide autotransformers as required by the loudspeaker manufacturer for the wattage taps shown on the drawings.
2. Loudspeakers shall be weather resistant, two-way, full range, and rated for permanent outdoor installation.
3. Frequency operating range shall be 85 Hz to 16 kHz, with ±4 dB between 125 Hz and 10 kHz. Crossover frequency shall be 2 kHz.
4. Loudspeakers shall be rated for 200 watts continuous input and 500 watts peak.
5. Sensitivity shall be 101 dB between 125 Hz and 10 kHz 1/3 octave bands.
6. Nominal input impedance shall be 8 ohms with a minimum impedance of 4.2 ohms at 9.7 kHz.
7. Drivers:
a. Low Frequency: 12-inch Ferrofluid-cooled.
b. High Frequency: 1-inch exit titanium free, Ferrofluid-cooled.
c. Drivers and crossover shall be weather-treated.
8. Nominal -6 dB beam width:
a. 90 degrees horizontal: +1 degree/-46 degrees from 1.6 kHz to 12.5 kHz.
b. 40 degrees vertical: +16/+1 degree from 1.6 kHz to 12.5 kHz.
9. Enclosure:
a. Enclosure shall be light gray Rotomolded LLDPE and UV resistant. Grill shall be steel with dual-layer powder-coated corrosion-resistant zinc-rich epoxy finish. Enclosure shall be rated for IP55W with minimum 5 degree downward angle.

b. Enclosure dimensions shall be 16 inches by 16 inches by 16 inches, maximum 35 pounds.

10. Loudspeaker shall have an outdoor rated weather and UV resistant cable with 16 AWG stranded wiring for external connection to loudspeaker wiring from amplifier.
11. Loudspeakers shall be Community Model R.5-94TZ, or equal. Provide a Community Model PMB pole-mounting bracket for each speaker. Provide one additional bracket per pole and manufacturer approved safety cabling for each set of loudspeakers.

K. Audio Jacks
1. Desk Top Mounted Audio Input Jack Faceplate:
a. Provide one single-gang universal jack insert surface-mount type faceplate with 1/8-inch TRS female audio jack. Faceplate shall be Extron Model CPM101 with compatible TRS jack module. Provide triple blank plate for remaining unused spaces.
b. Provide an etched Micarta label reading “Audio Input.”
2. Desk Top Mounted Headphone and Microphone Jack Faceplates:
a. Provide single-gang universal jack insert surface-mount type faceplates, quantity as shown on the drawings, with two 1/4-inch TRS female headphone jacks and one Neutrik 3-pin XLR female microphone jack. Faceplate shall be Extron Model CPM101 with compatible TRS and XLR jack modules.
b. Provide etched Micarta labels reading “Headphone” next to each 1/4-inch TRS jack and “MIC” nex to the XLR jack.

L. The sound system racks shall house the equipment specified herein and shown on the drawings, plus 25 percent space for future equipment. Provide blank cover plates for all unused rack spaces.

M. Rack-Mount Power Conditioner
1. Rack mount power conditioner and distribution unit shall have seven rear panel switched outlets, one rear panel unswitched outlet, and one front panel unswitched outlet.
2. Power conditioner shall have a 20 amp circuit breaker, RFI noise filtering, and clamping voltages of 400 Volts L-N, 500 Volts L-G, and 400 Volts N-G for surges up to 3000 Amps, 8/20us. Maximum spike clamping voltage shall be 6000 Volts.
3. Power conditioner shall have an on-off rocker switch, Power On LED, and AC Protection Active LED on the front panel.
4. Power conditioner shall be Atlas Sound Model AP-S20, or equal.

2.02 WIRE AND CABLE

A. Provide all adapters, plugs, and connectors required for a complete and functional installation.

B. Indoor Line-Level Audio Cable:
1. Audio cable shall be CM-rated, communications, broadcast quality, shielded-pair cable.
2. Cable shield shall have a 100% aluminum polyester tape foil with 7/30 22 AWG 7-strand tinned copper drain wire.
3. Audio cable shall comply with NEC articles 725 and 800.
4. Audio cable conductors shall be 7/30 22 AWG 7-strand tinned copper.
5. Audio cable shall have a pressure extruded PVC black-colored jacket with 0.010-inch nominal thickness. Nominal outside diameter shall be 0.142 inches.

6. Audio cable shall have the following properties:
    a. Maximum DCR: 15.3 Ω per 1,000 feet.
    b. Maximum Mutual Capacitance: 18.2 pF per foot.
    c. Maximum Shield Capacitance: 27.9 pF per foot.
    d. Impedance: 72 Ω.
    e. Voltage Rating: 300 Volts RMS.
7. Audio cable shall meet the following regulations:
    a. NEC-rated CMP.
    b. CEC-rated CMP.
    c. Eu RoHS 2002/95/EC Compliant.
8. Audio cable shall be as manufactured by Liberty Wire & Cable, Model 22-1P-EZ-BLK, or equal.

C. Loudspeaker Wire:
1. Loudspeaker wire shall be UL listed, twisted, unshielded, and NEC type CL2.
2. Loudspeaker conductors shall be 105/30 10 AWG stranded copper.
3. Loudspeaker wire shall have a pressure extruded PVC white-colored jacket with 0.040 inches nominal thickness. Nominal outside diameter shall be 0.385 inches.
4. Loudspeaker wire shall have the following properties:
    a. DCR: Maximum 1.07 Ω per 1,000 feet.
    b. Maximum Mutual Capacitance: 46 pF per foot.
    c. Voltage Rating: 150 Volts RMS.
5. Loudspeaker wire shall be as manufactured by Liberty Wire & Cable, Model 16-2C-P-WHT, or equal.

D. Underground Line-Level Audio Cable:
1. Underground audio cable shall be CM-rated, shielded-pair cable.
2. Underground audio cable shield shall have a 100% foil shield with 20 AWG stranded tinned copper drain wire.
3. Underground audio cable shall comply with NEC articles 725 and 800.
4. Underground audio cable conductors shall be 18 AWG 16/30 tinned copper.
5. Underground audio cable shall have a PVC chrome-colored jacket with 0.028-inch nominal thickness. Nominal outside diameter shall be 0.222 inches.
6. Underground audio cable shall have the following properties:
    a. Maximum DCR: 6.5 Ω per 1,000 feet.
    b. Maximum Mutual Capacitance: 29.8 pF per foot.
    c. Maximum Shield Capacitance: 44 pF per foot.
    d. Impedance: 57 Ω at 1 KHz.
    e. Voltage Rating: 300 Volts RMS.
7. Underground audio cable shall be as manufactured by Belden, Model 8760, or equal.

PART 3–EXECUTION

3.01 INSTALLATION

A. Install all cables and wire in conduit.

B. All cabling shall be installed in accordance with good engineering practices as established by the EIA and the NEC. Cabling shall meet all applicable local, state, and federal building codes. Lightning protection shall be included on all cables routed outdoors.

C. CONTRACTOR shall provide all conduits, junction boxes, pull boxes, outlets, terminal cabinets, and other enclosures as required, interconnected and wired. Provide No. 6 ground conductor in 3/4-inch conduit from each equipment rack to building service ground.

D. The sound system shall have a complete and dedicated raceway system. Conduits shall not be shared with other systems or wiring.

E. Provide labeling for all devices and wire/cable per Section 16195–Electrical Identification.

F. The load connected to an amplifier's output shall not exceed 80% of the manufacturer's listed maximum RMS output for each channel.

G. All speaker wire taps shall be made with 63/37 rosin core solder, Kester 44, or equal. Heatshrink all connections airtight. All solder connections shall be located in solder-tap junction boxes as noted on the drawings.

H. Work associated with system installation shall include initial tests and adjustments necessary to establish and modify performance of the sound system as required to assure adequate coverage, quality, and level. Accordingly, loudspeaker units shall be oriented, balanced and phased, and "normal" settings shall be established and marked for all level controls.

I. System shall be free of hum, buzz, or static.

J. CONTRACTOR shall coordinate Equalizer settings to cut off frequencies below the loudspeaker manufacturer's recommended high-pass filter frequency.

K. All equipment shall be installed and wired in accordance with accepted engineering and installation practices. Only the highest degree of workmanship will be accepted. Install in accordance with Electronic Systems Technician (EST) practices.

L. All cables shall be run continuously and no splicing may be made in any cable run.

M. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer published torque tightening values for equipment connectors. Where manufacturer's torque requirements are not indicated, tighten connectors and terminals to comply with tightening torque per NEC specification.

N. The following circuit types shall be installed in their own conduits:
   1. Line-level audio cables.
   2. Loudspeaker wiring.
   3. Power wiring.

O. Just prior to substantial completion, clean all devices, cabinets, and housings and replace all equipment rack filters.

P. Verify installed cables and wiring is free of opens, ground-loops, and shorts.

3.02 PERFORMANCE TESTING AND ADJUSTMENTS

A. Test inputs and outputs of all devices to verify compliance with the functional requirements of the sound system specified herein.

B. Contractor shall perform a 1/3-octave real-time frequency analysis of the installed sound system using a digital real-time audio spectrum analyzer (RTA) over the entire audible frequency spectrum. A pink-noise input signal shall be used for all RTA tests. Initial testing before adjustment shall be done with all graphic equalizer frequency band adjustments set to 0.0 dB gain/cut, except those frequency bands at full cutoff for loudspeaker high-pass filtering. RTA shall be NTI Audio Model XL2 with M4260 microphone, or equal. Cell-phone based RTAs are not acceptable.

C. All graphic equalizer bands shall be boosted or cut from the 0.0 dB baseline setting from the initial test such that each 1/3-octave band has a maximum frequency response variation of ±6 dB from all other 1/3-octave bands. The frequency response for the single-octave band centered at 4000 Hz shall be ±3 dB. Retest and adjust as required to provide the specified variances across the entire audible frequency spectrum.

D. By operational testing, OWNER will give final acceptance of the sound system once the sound system installation is complete, the system is fully functional, and has been tested and adjusted as specified herein. CONTRACTOR shall provide additional graphic equalizer adjustments to OWNER's satisfaction. Retest the system and provide a copy of the final test report to OWNER.

E. The loudspeaker shall be re-aimed to OWNER's satisfaction as required to provide minimum 85 dB at seating locations in the loudspeaker's direct aiming path, and minimum 75 dB at all open seating locations while maintaining trespass noise below 65 dB at the property line of the neighboring community to the north.

3.03 START-UP SERVICES

A. Training Program:
   1. Submit training plan, including course syllabus, personnel who will be conducting the training, and schedule.
   2. Provide materials, instructors, and workbooks to complete the training.
   3. Training courses shall include: Operator training. Course length minimum 4 hours. Training shall utilize equipment specified herein following installation and field testing. (One half-day session with two maintenance staff personnel shall be provided at the site.)
   4. Training shall be directed to system and equipment operation, maintenance, troubleshooting, and equipment and system-related areas other than the process itself.

B. Post start-up support shall include follow-up services such as replacement of defective equipment, as well as additional training, and control configurations as requested by OWNER. This shall include an allowance of 8 hours for work on-site other than warranty repair or replacement of defective equipment. This time shall be used for system setting enhancements and modifications to improve the operation of the system. It shall be assumed that this 8 hours includes 2 trips to the site.

3.04 WARRANTY

A. The manufacturer shall warrant that all equipment shall be free from defects in material and workmanship under normal and proper use and service for a period of 1 year after substantial completion.

B. Prior to termination of the guarantee period, CONTRACTOR shall retain the services of the audio system manufacturer's personnel to inspect and make adjustments and changes as required to put the system in first-class operating order.

END OF SECTION

For more location information
please visit www.strand.com

Office Locations

Cincinnati, Ohio | 513.861.5600

Columbus, Indiana | 812.372.9911

Columbus, Ohio | 614.835.0460

Indianapolis, Indiana | 317.423.0935

Joliet, Illinois | 815.744.4200

Lexington, Kentucky | 859.225.8500

Louisville, Kentucky | 502.583.7020

Madison, Wisconsin* | 608.251.4843

Milwaukee, Wisconsin | 414.271.0771

Phoenix, Arizona | 602.437.3733

*Corporate Headquarters

STRAND ASSOCIATES®

Parks Office

OCTOBER 2013 CALENDAR

Soccer stadium AT BREESE STEVENS FIELD

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4 Memorial High School 6:30P- 8:30P Memorial	5 EDGEWOOD COLLE 11:00A- 3:30P
6	7	8 EDGEWOOD COLLE 7:00P- 9:00P	9 EDGEWOOD COLLE 7:00P- 9:00P	10	11	12
13	14	15	16	17	18	19 EDGEWOOD COLLE 11:00A- 1:00P
20	21	22	23 EDGEWOOD COLLE 7:00P- 9:00P	24	25	26 EDGEWOOD COLLE 11:00A- 3:30P
27	28	29	30 EDGEWOOD COLLE 7:00P- 9:00P	31	1	2 EDGEWOOD COLLE 4:00A-10:00P possible playoffs

Run Date: 04/23/13

NOVEMBER 2013 CALENDAR

Run Time: 12:20P

Soccer stadium AT BREESE STEVENS FIELD

User: PKKMP

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2 EDGEWOOD COLLE 4:00A-10:00P possible playoffs
3 EDGEWOOD COLLE 4:00A-10:00P possible playoffs	4	5 EDGEWOOD COLLE 4:00A-10:00P possible playoffs	6 EDGEWOOD COLLE 4:00A-10:00P possible playoffs	7	8	9 EDGEWOOD COLLE 4:00A-10:00P possible playoffs
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Department of Planning & Community & Economic Development
Planning Division

Website: www.cityofmadison.com

Madison Municipal Building, Suite LL100
215 Martin Luther King, Jr. Boulevard
P.O. Box 2985
Madison, Wisconsin 53701-2985
TTY/TEXTNET 866 704 2318
FAX 608 266-8739
PH 608 266-4635

April 23, 2013

Mr. Tom Maglio
City of Madison Parks Division

re: Breese Stevens
Request for Certificate of Appropriateness for exterior alteration to designated landmark

Tom:

Thank you for submitting materials describing an upcoming improvement project involving the lighting and sound system at Breese Stevens Field. On behalf of the Madison Landmarks Commission, I have reviewed, in accordance with the Madison General Ordinances pertaining to criteria for exterior alteration, your proposal to remove the three remaining truss/ladder assemblies and replace them with poles to match the previously installed poles. As the designee of the Landmarks Commission, I have approved the issuance of a Certificate of Appropriateness for the exterior alteration to Breese Stevens Field.

This letter will serve as your "Certificate of Appropriateness" for the project. When you apply for a building permit, take this letter with you to the Building Inspection Counter, Department of Planning and Development, Lower Level Suite LL-100, Madison Municipal Building, 215 Martin Luther King, Jr. Boulevard.

Please note that any major design changes from the plans submitted to the Landmarks Commission must receive approval by the Landmarks Commission, or staff designee, prior to the issuance of the building permit.

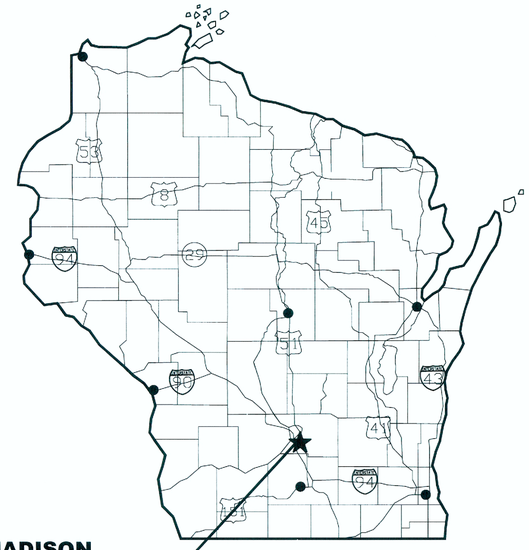
If you have any questions, please contact me (266-6552 or ascanlon@cityofmadison.com).

Best regards,

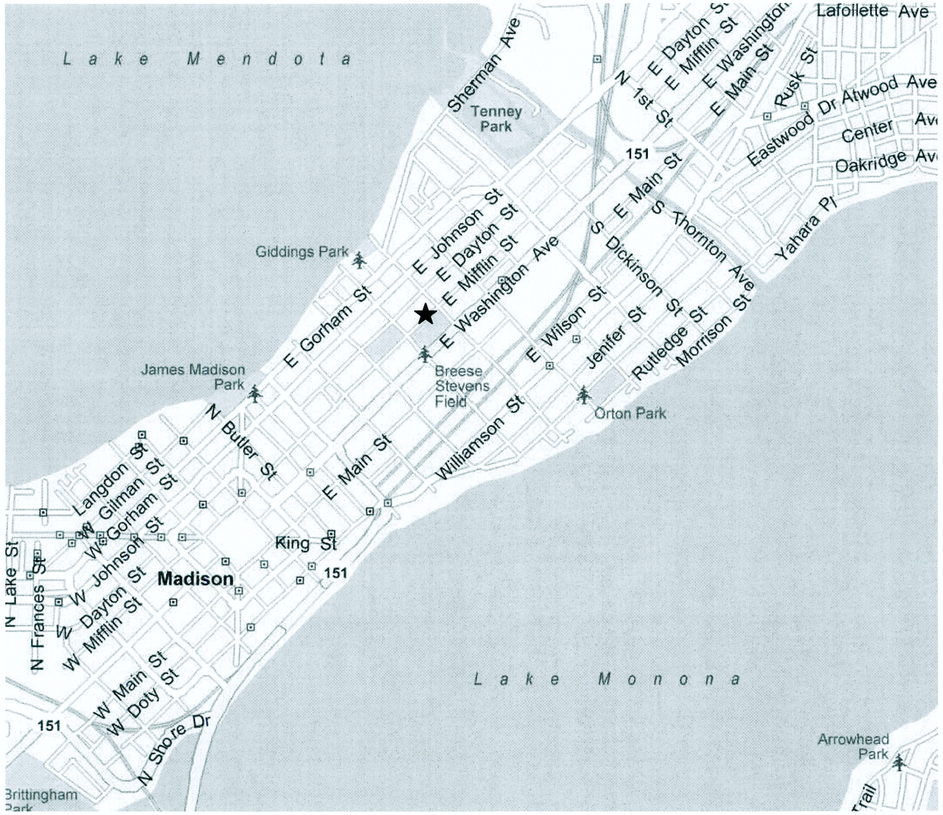
**** SENT VIA EMAIL ****

Amy L. Scanlon, Registered Architect, LEED® AP
Preservation Planner
Secretary of the Madison Landmarks Commission

BREESE STEVENS FIELD
LIGHTING/SOUND SYSTEM IMPROVEMENTS
FOR THE
CITY OF MADISON
MADISON, WISCONSIN
MAY, 2013



PROJECT LOCATION
NO SCALE



AREA MAP
NO SCALE

LIST OF DRAWINGS

SHEET NO.	DRAWING NO.	DRAWING TITLE
	GENERAL	
1	G0.1	TITLE SHEET, LOCATION MAP, AND LIST OF DRAWINGS
2	G0.2	STANDARD SYMBOLS
3	G0.3	ABBREVIATIONS
	DEMOLITION	
4	D1.1	DEMOLITION PLAN
	STRUCTURAL	
5	DAS1.1	LIGHT POLE BASE PLANS, SECTIONS, AND DETAILS
	ELECTRICAL	
6	E1.1	SPORTS LIGHTING SITE PLAN
7	E1.2	SOUND SYSTEM SITE PLAN
8	E1.3	SOUND SYSTEM PLAN - EXISTING PRESS BOX
9	E5.1	DETAILS, SCHEDULES, AND ELECTRICAL ONE-LINE DIAGRAM
10	E6.1	SOUND SYSTEM RISER DIAGRAM

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WISCONSIN
ERIC M. FISHER
E-37739
MADISON
WI
PROFESSIONAL ENGINEER
4/30/13

STRAND ASSOCIATES®

CONTRACT: 7044

SHEET
1
G0.1

ELECTRICAL SYMBOLS

LIGHTING

- FIXTURE SYMBOL (TYPICAL) A–INDICATES FIXTURE TYPE 2–INDICATES CIRCUIT NUMBER b–INDICATES SWITCHING SOLID CIRCLE INDICATES ALWAYS ON
- INCANDESCENT, LED, HID, SURFACE OR PENDANT
- POLE MOUNTED LIGHT FIXTURE(S)
- ELECTRICAL COMPONENT ENCLOSURE
- 1X4 FLUORESCENT, SURFACE OR PENDANT
- 1X8 FLUORESCENT, SURFACE OR PENDANT
- FLUORESCENT, WALL
- 1X4 FLUORESCENT, RECESSED
- 2X2 FLUORESCENT, RECESSED
- 2X4 FLUORESCENT, RECESSED
- CAN, FLUORESCENT, LED, OR HID
- EXIT, SURFACE, PENDANT OR RECESSED
- EXIT, WALL
- EMERGENCY LIGHTING

SWITCHES

- SINGLE POLE
- TWO POLE
- THREE WAY
- FOUR WAY
- KEYED
- DIMMER
- MANUAL MOTOR SWITCH (3 PHASE)
- WEATHER PROOF
- SWITCH WITH PILOT LIGHT
- LC LIGHTING CONTROL STATION
- R3 LOCKOUT STOP SWITCH
- DP DOOR POSITION SWITCH
- PC PHOTOCELL

EQUIPMENT AND WIRING

- GROUND ROD 10'-5/8" DIA. COPPER CLAD
- TRANSFORMER
- DISCONNECT, F=FUSED, B=CIRCUIT BREAKER, BLANK=NON–FUSED
- MOTOR STARTER MAGNETIC
- CIRCUIT BREAKER COMBINATION STARTER
- JUNCTION BOX
- T LINE VOLTAGE THERMOSTAT
- T LINE VOLTAGE THERMOSTAT W/REMOTE BULB
- P–01–01 480V LOAD, REFER TO MCC SCHEDULE FOR EQUIPMENT NUMBER
- VFD VARIABLE FREQUENCY DRIVE

POWER SYMBOLS

- E UNDERGROUND ELECTRIC
- OH OVERHEAD ELECTRIC
- CIRCUIT NUMBER (TYPICAL)
- 2(X) OTHERWISE SHOWN PANEL DESIGNATION (TYP.)
- DUPLEX, 125 VOLT, WP INDICATES WEATHERPROOF
- DUPLEX, 125 VOLT, ABOVE FURNITURE
- DOUBLE DUPLEX, 125 VOLT, ABOVE FURNITURE
- DOUBLE DUPLEX, 125 VOLT
- EWC SINGLE CONVENIENCE, 125 VOLT FOR ELECTRIC WATER COOLER
- EXPLOSION–PROOF, ABOVE FURNITURE
- EXPLOSION–PROOF
- FIXED EQUIPMENT CONNECTION
- POWER OUTLET, VOLTAGE & AMPERAGE AS INDICATED
- AUTOMATIC TRANSFER SWITCH (ONE–LINE DIAGRAM)
- CIRCUIT BREAKER (ONE–LINE DIAGRAM)
- M METER (ONE–LINE DIAGRAM)
- PANELBOARD

FIRE ALARM AND DETECTION SYMBOLS

- FACP FIRE ALARM CONTROL PANEL
- FAAP FIRE ANNUNCIATOR CONTROL PANEL
- STROBE; WALL MOUNT – ADA RATED
- ## STROBE CANDELA RATING 80" AFF
- H HORN STROBE; WALL MOUNT – ADA RATED
- ## STROBE CANDELA RATING 80" AFF
- S SPEAKER STROBE; WALL MOUNT – ADA RATED
- ## STROBE CANDELA RATING 80" AFF
- FA H HORN; WALL MOUNT – ADA RATED
- FA S SPEAKER; WALL MOUNT – ADA RATED
- F STROBE; CEILING MOUNT – ADA RATED
- T ## STROBE CANDELA RATING
- H HORN STROBE; CEILING MOUNT – ADA RATED
- ## STROBE CANDELA RATING
- S SPEAKER STROBE; CEILING MOUNT – ADA RATED
- ## STROBE CANDELA RATING
- ARA AREA OF RESCUE ASSISTANCE
- EMERGENCY TELEPHONE SYSTEM
- H HEAT DETECTOR; CEILING MOUNT
- Z SMOKE DETECTOR; CEILING MOUNT
- Z R ELEVATOR RECALL SMOKE DETECTOR
- NOX NITROUS OXIDE SENSOR
- CO CARBON MONOXIDE SENSOR
- SWITCH INDICATION
- DSD DUCT SMOKE DETECTOR
- ## DUCT SIZE
- RTS REMOTE TEST SWITCH
- SWITCH INDICATION
- FIRE ALARM PULL STATION
- SFS SPRINKLER FLOW SWITCH
- TM SPRINKLER VALVE TAMPER SWITCH
- B FIRE ALARM BELL

INSTRUMENTATION EQUIPMENT

- AE ANALYSIS ELEMENT
- AIT* ANALYSIS INDICATING TRANSMITTER, *: DO=DISSOLVED OXYGEN, PH=PH, TRB=TURBIDITY, TSS=TOTAL SUSPENDED SOLIDS, GD=GAS DETECTOR, CA=CHLORINE ANALYZER, OP=OXYGEN PURITY, LEL=LOWER EXPLOSIVE LIMIT, PR=PROXIMITY, MST=MOISTURE
- CS 1,2 CONTROL SWITCH DEVICE TYPE (SEE MCC SCHEDULE)
- DE DENSITY ELEMENT
- DIT DENSITY INDICATING TRANSMITTER
- FE FLOW ELEMENT
- FIT* FLOW INDICATING TRANSMITTER, *: M=MAGNETIC, TM= THERMAL MASS DP=DIFFERENTIAL PRESSURE, U=ULTRASONIC
- FS* FLOW SWITCH *: P=PADDLE, T=THERMAL, C=CAPACITANCE, A=AIR FLOW
- HS* HAND SWITCH *: SS=SAFETY SWITCH
- IE OR EE POWER ELEMENT (CURRENT XFMR, POTENTIAL XFMR)
- IS CURRENT SWITCH
- JIT POWER INDICATING TRANSMITTER
- KS TIME SWITCH
- LE LEVEL ELEMENT
- LIT* LEVEL INDICATING TRANSMITTER, *: S=SUBMERSIBLE, U=ULTRASONIC, R=RING TYPE
- LS* LEVEL SWITCH, *: C=CONDUCTANCE, F=BALL FLOAT, V=VIBRATING FORK, B=BUILDING FLOODING
- PDIT DIFFERENTIAL PRESSURE INDICATING TRANSMITTER
- PE PRESSURE ELEMENT
- PIT PRESSURE INDICATING TRANSMITTER
- PS PRESSURE SWITCH
- SS SPEED SWITCH
- TC TEMPERATURE CONTROLLER
- TE* TEMPERATURE ELEMENT, *: R=RTD, T=THERMOCOUPLE
- TIT TEMPERATURE INDICATING TRANSMITTER
- TK TEMPERATURE CONTROL STATION
- TS TEMPERATURE SWITCH
- TT TEMPERATURE TRANSMITTER
- VE VIBRATION ELEMENT
- VIT VIBRATION INDICATING TRANSMITTER
- WE WEIGHT ELEMENT
- WS TORQUE SWITCH
- WT WEIGHT TRANSMITTER (SCALE)
- YS PRESENCE/ABSENCE DETECTOR
- ZS* POSITION SWITCH, *: D=DOOR, L=LIMIT, P=PROXIMITY
- SOLENOID VALVE
- FIX FIXED SECURITY CAMERA
- PTZ PAN, TILT, ZOOM SECURITY CAMERA

TECHNOLOGY SYMBOLS

- (*) DATA JACK; * = # OF JACKS
- (*) POTS ANALOG PHONE JACK; * = # OF JACKS
- (*P *D) POTS ANALOG PHONE AND DATA JACKS; * = # OF JACKS
- VOIP WALL MOUNT VOIP PHONE JACK 54" AFF
- WALL MOUNT POTS ANALOG PHONE JACK 54" AFF
- SCADA NETWORK JACK
- DATA RACK
- COAX CABLE
- POWER POLE
- * S PA SYSTEM SPEAKER *WATTAGE TAP
- A SPEAKER; CEILING MOUNT A=SPEAKER TYPE
- K KEY PAD
- GBD GLASS BREAK DETECTOR
- MS MOTION SENSOR
- P PUSH BUTTON
- ES ELECTRIC STRIKE
- ML MAGNETIC LOCK
- I INTERCOM STATION
- OS OCCUPANCY SENSOR
- ## SEE SPECIFICATION FOR SENSOR TYPE
- YE CARD READER
- RVC REMOTE VOLUME CONTROL

DUCTWORK SYMBOLS

- SUPPLY DUCT (UP OR SECTION)
- SUPPLY OR OUTSIDE AIR DUCT (DOWN/OR AWAY)
- EXHAUST DUCT (UP OR SECTION)
- EXHAUST OR RETURN DUCT (DOWN/OR AWAY)
- ROUND DUCTWORK UP
- ROUND DUCTWORK DOWN
- FLEXIBLE CANVAS CONNECTION
- TURNING VANES

DAMPER SYMBOLS

- M AUTOMATIC DAMPER
- BDD BACKDRAFT DAMPER
- MANUAL VOLUME DAMPER
- FD 1–1/2 HR. FIRE DAMPER

FIELD MOUNTED CONTROLS

- T THERMOSTAT
- H ROOM HUMIDISTAT
- P PRESSURE SENSOR
- S ROOM SENSOR
- S DUCT SMOKE DETECTOR
- PRESSURE GAUGE

ACTUATORS

- M MOTOR (ELECTRIC)
- P PNEUMATIC
- S SOLENOID

EQUIPMENT SYMBOLS

- ACU ACCUMULATOR
- AIR FLOW DIRECTION
- BASE MOUNTED PUMP
- BLOWER
- CEILING DIFFUSER WITH FLEXIBLE DUCT
- CENTRIFUGAL PUMP
- CONNECT TO EXISTING
- DT DRIP TRAP
- DUCT BOOST COIL
- Type Group EQUIPMENT TAG
- FA FLAME ARRESTER
- FC FLAME CELL
- FT FLAME TRAP ASSEMBLY
- G GRINDER
- INLINE PUMP
- POSITIVE DISPLACEMENT PUMP
- ROOF EXHAUST FAN
- UNIT HEATER
- VARIABLE AIR VOLUME (VAV) BOX WITH ELECTRIC REHEAT COIL
- VARIABLE AIR VOLUME (VAV) BOX WITH HEATING HOT WATER REHEAT COIL
- FLOATING MIXER
- SCREW CONVEYOR

NO.	REVISIONS	DATE:

STANDARD SYMBOLS

917 EAST MIFFLIN STREET
CITY OF MADISON
MADISON, WISCONSIN

JOB NO. 1020.074

PROJECT MGR. DAVE GOHDES

STRAND ASSOCIATES®

SHEET 2 G0.2

File: S:\MAD\1000--1099\1020\074\Acad\G0.2.dwg Time: Apr 26, 2013 - 3:53pm

GENERAL EQUIPMENT ABBREVIATIONS

AC	AIR COMPRESSOR
ACU	ACCUMULATOR
ADT	AUTOMATIC DRIP TRAP
AFT	AUTOMATIC FILTER
AOV	AIR OPERATED VALVE
AM	ANOXIC MIXER
AST	AUTOMATIC STRAINER
BSLP	BLENDED SLUDGE PUMP
B	BLOWER
BC	BRIDGE CRANE
BFP	BELT FILTER PRESS
BFPFP	BFP FEED PUMP
BFV	BUTTERFLY VALVE
BLP	BIOSOLIDS LOADING PUMP
BLR	BOILER
BP	BOOSTER PUMP
BSLMP	BLENDED SLUDGE MIXING PUMP
BSLP	BLENDED SLUDGE PUMP
BSTM	BIOSOLIDS STORAGE MIXER
BTP	BIOSOLIDS TRANSFER PUMP
CENT	CENTRIFUGE
CNTP	CENTRATE PUMP
CENTP	CENTRIFUGE FEED PUMP
CP	CHEMICAL PUMP
COMP	COMPRESSOR
CON	CONVEYOR
DBC	DEWATERED BIOSOLIDS CONVEYOR
DCP	DECANT PUMP
DEWP	DISINFECTED EFFLUENT PUMP
DP	DRAINAGE PUMP
DRLP	DIGESTER RECIRCULATION PUMP
DSLMP	DIGESTER MIXING PUMP
DSLTP	DIGESTED SLUDGE TRANSFER PUMP
DT	DRIP TRAP
DOW	DOWNWARD OPENING WEIR GATE
EFC	EXCESS FLOW CLARIFIER
EFP	EXCESS FLOW PUMP
EFSP	EXCESS FLOW SOLIDS PUMP
EP	EFFLUENT PUMP
FC	FINAL CLARIFIER
FCD	FINAL CLARIFIER DRIVE
FEP	FINAL EFFLUENT PUMP
FILT	FILTER
FM	FLOW METER
FT	FLAME TRAP
GBT	GRAVITY BELT THICKENER
GC	GRIT CLASSIFIER
GFM	GAS FLOW METER
GCS	GAS COMPRESSOR SKID
GP	GRIT PUMP
GRN	GRINDER
GT	GRIT TRAP
GUH	GAS UNIT HEATER
GW	GRIT WASHER
H	HOIST
HBT	HYDROPNEUMATIC BOOSTER TANK
HTX	HEAT EXCHANGER
IP	INFLUENT PUMP
MA	MOTORIZED ACTUATOR
MBV	MOTORIZED BALL VALVE
MFS	MECHANICAL FINE SCREEN
MIX	MIXER
MOV	MOTOR OPERATED VALVE
MP	MIXING PUMP
MPE	MISCELLANEOUS PROCESS EQUIPMENT
MST	MANUAL STRAINER
MT	MICROTURBINE
NRP	NITRATE RECYCLE PUMP
OCD	OVERHEAD COILING DOOR
OCE	ODOR CONTROL EQUIPMENT
ODE	OXIDATION DITCH EQUIPMENT
PC	PROGRESSING CAVITY PUMP
PCD	PRIMARY CLARIFIER DRIVE
PCFD	PRIMARY CLARIFIER FLOCCULATOR DRIVE
PF	POLYMER FEEDER
PFP	POLYMER FEED PUMP
PLWP	PLANT WATER PUMP
PRCP	PHOSPHORUS REMOVAL CHEMICAL PUMP
PRCT	PHOSPHORUS REMOVAL CHEMICAL TANK
PREP	PRIMARY EFFLUENT PUMP
PRFP	PROCESS RETURN FLOW PUMP
PRSP	PRIMARY SLUDGE PUMP
PTP	POLYMER TRANSFER PUMP
RAD	REFRIGERATED AIR DRYER
RASP	RETURN ACTIVATED SLUDGE PUMP
RDT	ROTARY DRUM THICKENER
RDTP	ROTARY DRUM THICKENER FEED PUMP
RM	RAPID MIXER
SA	SAMPLER
SBFP	SODIUM BISULFITE FEED PUMP
SBST	SODIUM BISULFITE STORAGE TANK
SCMP	SCUM PUMP
SCW	SCREENINGS WASHER
SEJ	SEWAGE EJECTOR
SG	SLIDE GATE
SHFP	SODIUM HYPOCHLORITE FEED PUMP
SHST	SODIUM HYPOCHLORITE STORAGE TANK
SLG	SLUICE GATE
SP	SUMP PUMP
SRT	SILOXANE REMOVAL TANK
SSC	SCREENINGS SCREW CONVEYOR
STCP	STRUVITE CHEMICAL PUMP
STG	STOP GATE
STR	STRAINER
SV	SOLENOID VALVE
SWP	SCREENINGS WASHER/PRESS
TV	TELESCOPING VALVE
TWASP	TWAS PUMP
UV	ULTRAVIOLET DISINFECTION
WASP	WAS PUMP

FLUID ABBREVIATIONS

A	AIR
BSL	BLENDED SLUDGE
CA	COMPRESSED AIR
CNT	CENTRATE
CDG	COMPRESSED DIGESTER GAS
CLS	CHLORINE SOLUTION
CNT	CENTRATE
CW	COLD WATER
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
D	DRAIN
DEW	DISINFECTED EFFLUENT WATER
DG	DIGESTER GAS
DIV	DIVERSION
DRL	DIGESTER RECIRCULATION
DS	DIGESTER SUPERNATANT
DSL	DIGESTED SLUDGE
DSL MD	DIGESTER SLUDGE MIXER DISCHARGE
DSL MS	DIGESTER SLUDGE MIXER SUCTION
EF	EXCESS FLOW
EFS	EXCESS FLOW SOLIDS
FE	FINAL EFFLUENT
F	FORCE MAIN
G	NATURAL GAS
GR	GRIT
GTS	GRAVITY THICKENER SUPERNATANT
HOCL	HYPOCHLORITE
HW	HOT WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
ML	MIXED LIQUOR
NAOH	SODIUM HYDROXIDE
NPW	NONPOTABLE WATER
OF	OVERFLOW
OC	ODOR CONTROL
PDP	PERFORATED DRAIN PIPE
PE	PLANT EFFLUENT
PEC	POLYELECTROLYTE CHEMICAL
PI	PLANT INFLUENT
PRC	PHOSPHORUS REMOVAL CHEMICAL
PRE	PRIMARY EFFLUENT
PRF	PROCESS RETURN FLOW
PRI	PRIMARY INFLUENT
PRS	PRIMARY SLUDGE
PSS	PLANT SANITARY SEWER
PW	POTABLE WATER
PWR	PROCESS WATER RETURN
PWS	PROCESS WATER SUPPLY
RAS	RETURN ACTIVATED SLUDGE
RW	RAW WASTEWATER
SAM	SAMPLE
SAN	SANITARY SEWER
SB	SODIUM BISULFITE
SCM	SCUM
SCMD	SCUM DECANT
SE	SECONDARY EFFLUENT
SH	SODIUM HYPOCHLORITE
SL	SLUDGE
SPD	SUMP PUMP DISCHARGE
ST	STORM SEWER
STC	STRUVITE CHEMICAL
SW	SERVICE WATER
SWS	SEAL WATER SUPPLY
TSL	THICKENED SLUDGE
TWAS	THICKENED WASTE ACTIVATED SLUDGE
V	VENT
W	POTABLE WATER
WAS	WASTE ACTIVATED SLUDGE
WML	WASTE MIXED LIQUOR

PLUMBING ABBREVIATIONS

AEW	APRON END WALL
BF	BLIND FLANGE
CA	COMPRESSED AIR
CB	CATCH BASIN
CD	CONDENSATE DRAIN
CI	CAST IRON
CO	CLEAN OUT
COND	CONDENSATE
CPVC	CHLORINATED POLYVINYL CHLORIDE
CW	COLD WATER
D	DRAIN
DCBP	DOUBLE CHECK BACKFLOW PREVENTER
DF	DRINKING FOUNTAIN
DFU	DRAINAGE FIXTURE UNIT
DI	DUCTILE IRON
ESEW	EMERGENCY SHOWER EYEWASH
EW	EYEWASH
EWC	ELECTRIC WATER COOLER
FCO	FLOOR CLEAN OUT
FD	FLOOR DRAIN
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
HB	HOSE BIBB
HD	HUB DRAIN
HDPE	HIGH DENSITY POLYETHYLENE
HHWR	HEATING HOT WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
HR	HOSE REEL
HWL	HIGH WATER LEVEL
HW	HOT WATER
HWR	HOT WATER RETURN
IE	INVERT ELEVATION
IWP	INDIRECT WASTE PIPE
L	LAVATORY
MB	MOP BASIN
MH	MANHOLE
MV	MUD VALVE
PHW	PROCESS HOT WATER
P	PUMP
POC	POINT OF CONNECTION
PRV	PRESSURE REDUCING VALVE
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVR	PRESSURE VACUUM RELIEF ASSEMBLY
QC	QUICK CONNECT
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
RZBP	REDUCED ZONE BACKFLOW PREVENTER
S	SINK
SD	SHOWER DRAIN
SEJ	SEWAGE EJECTOR
SHR	SHOWER
SP	SUMP PUMP
SS	STAINLESS STEEL
SV	SOLENOID VALVE
SVS	SERVICE SINK
T	TANK
TD	TRENCH DRAIN
U	URINAL
V	VENT
VB	VACUUM BREAKER
VCP	VITRIFIED CLAY PIPE
VTR	VENT THRU ROOF
WCO	WALL CLEANOUT
WC	WATER CLOSET
WH	WATER HEATER
WS	WATER SOFTENER
WSFU	WATER SERVICE FIXTURE UNIT

GENERAL/HVAC ABBREVIATIONS

ACH	AIR CHANGES PER HOUR
AFF	ABOVE FINISHED FLOOR
ALT	ALTERNATE
AP	ACCESS PANEL
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
COND	CONDENSATE
DAT	DISCHARGE AIR TEMPERATURE
DB	DRY BULB TEMPERATURE
DDC	DIRECT DIGITAL CONTROL
DG	DOOR GRILLE
DX	DIRECT EXPANSION
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EL	ELEVATION
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
FC	FAIL CLOSED
FLA	FULL LOAD AMPS
FO	FAIL OPEN
FPI	FINS PER INCH
FPM	FEET PER MINUTE
FT	FEET
GA	GAUGE
GPM	GALLONS PER MINUTE
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSANDS OF BTU PER HOUR
MC	MECHANICAL CONTRACTOR
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OC	ON CENTER
OV	OUTLET VELOCITY
PD	PRESSURE DROP
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
RA	RETURN AIR
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SP	STATIC PRESSURE

HVAC EQUIPMENT ABBREVIATIONS

ACCU	AIR COOLED CONDENSING UNIT
AFR	ARCHITECTURAL FINE TUBE RADIATION
AHU	AIR HANDLING UNIT
AS	AIR SEPARATOR
BLR	BOILER
BB	BASEBOARD
C	CONVECTOR
CD	CEILING DIFFUSER
CHILL	CHILLER
CT	COOLING TOWER
CUH	CABINET UNIT HEATER
CWP	CHILLED WATER PUMP
DC	DRY COOLER
DH	DEHUMIDIFIER
DL	DRUM LOUVER
EBB	ELECTRIC BASEBOARD
EDH	ELECTRIC DUCT HEATER
EF	EXHAUST FAN
EG	EXHAUST GRILLE
EJ	EXPANSION JOINT
EL	EXPANSION LOOP
ER	EXHAUST REGISTER
ERC	ELECTRIC REHEAT COIL
ERU	ENERGY RECOVERY UNIT
EUH	ELECTRIC UNIT HEATER
EWH	ELECTRIC WALL HEATER
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FR	FINNED TUBE RADIATION
FUR	FURNACE
GDF	GAS DUCT FURNACE
GRV	GRAVITY ROOF VENTILATOR
GUH	GAS UNIT HEATER
HC	HEATING COIL
HP	HEAT PUMP
HRP	HEAT RECOVERY PUMP
HU	HUMIDIFIER
HWH	HOT WATER UNIT HEATER
HWP	HOT WATER PUMP
HTX	HEAT EXCHANGER
ICF	INDUSTRIAL CEILING FAN
IR	INFRARED HEATER
L	LOUVER
MAU	MAKE-UP AIR UNIT
P	PUMP
PWP	PROCESS WATER PUMP
RF	RETURN FAN
RG	RETURN GRILLE
RR	REGISTER
RTU	ROOFTOP UNIT
SD	SUCTION DIFFUSER
SF	SUPPLY FAN
SG	SUPPLY GRILLE
SR	SUPPLY REGISTER
ST	STEAM TRAP
SUH	STEAM UNIT HEATER
TCP	TEMPERATURE CONTROL PANEL
TG	TRANSFER GRILLE
UH	UNIT HEATER
UV	UNIT VENTILATOR
VAV	VARIABLE AIR VOLUME BOX
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
WSHP	WATER SOURCE HEAT PUMP
XT	EXPANSION TANK

ELECTRICAL ABBREVIATIONS

A	AMPERE
AF	AMPERE FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPTING CAPACITY
AL	ALUMINUM
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AV	AUDIO VISUAL
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
C	CONDUIT
CAT	CATALOG
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CL	CENTERLINE
CLG	CEILING
COL	COLUMN
CT	CURRENT TRANSFORMER
CTE	CONNECT TO EXISTING
CU	COPPER
CUH	CABINET UNIT HEATER
D	DEDICATED
DC	DIRECT CURRENT
DISC	DISCONNECT
DWG	DRAWING
E	EMERGENCY
EC	ELECTRICAL CONTRACTOR
EDH	ELECTRIC DUCT HEATER
EF	EXHAUST FAN
EMT	ELECTRICAL METALLIC TUBING
EOL	END OF LINE DEVICE
EWC	ELECTRIC WATER COOLER
EX	EXISTING
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FCU	FAN COIL UNIT
FLA	FULL LOAD AMPERES
FPCP	FIRE PUMP CONTROL PANEL
FR	FIRE RETARDANT
FT	FEET
FDA	FOOD AND DRUG ADMINISTRATION
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
G	GROUND
GC	GENERAL CONTRACTOR
GFI	GROUND FAULT INTERRUPTER
GFP	GROUND FAULT PROTECTION (EQUIPMENT)
GFCI	GROUND FAULT CKT INTERRUPTER
GRS	GALVANIZED RIGID STEEL
HACR	HEATING AND AIR CONDITIONING RATED
HP	HORSEPOWER
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATING, & AIR CONDITIONING
HZ	HERTZ
IG	ISOLATED GROUND
IMC	INTERMEDIATE METAL CONDUIT
JB	JUNCTION BOX
KCMIL	ONE THOUSAND CIRCULAR MILS
KO	KNOCKOUT
KVA	KILOVOLT AMPERES
KVAR	KILOVOLT AMPERES REACTIVE
KW	KILOWATT
LP	LIGHTING PANEL
LTG	LIGHTING
LV	LOW VOLTAGE
MATV	MASTER ANTENNA TELEVISION
MC	METAL CLAD
MCC	MOTOR CONTROL CENTER
MCB	MAIN CIRCUIT BREAKER
MCCB	MOLDED CASE CIRCUIT BREAKER
MCM	THOUSAND CIRCULAR MILS
MCP	MOTOR CIRCUIT PROTECTOR
MDP	MAIN DISTRIBUTION PANELBOARD
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MO	MOTOR OPERATED
MSB	MAIN SWITCHBOARD
MTD	MOUNTED
MTG	MOUNTING
MTS	MANUAL TRANSFER SWITCH
MV	MEDIUM VOLTAGE
MW	MICROWAVE OR MEGAWATT
N	NEUTRAL
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NAC	NOTIFICATION APPLIANCE CIRCUIT PANEL
NEC	NATIONAL ELECTRIC CODE
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NM	NONMETALLIC
NO	NORMALLY OPEN
NSF	NATIONAL SANITARY FOUNDATION
NTS	NOT TO SCALE
OCB	OIL CIRCUIT BREAKER
OL	OVERLOAD
OT	OVERTEMP
PR	PAIR
P	POLE
PB	PULL BOX
PC	PULL CORD
PH	PH SENSOR
ø	PHASE
PNL	PANELBOARD
PRI	PRIMARY
PT	POTENTIAL TRANSFORMER
PTZ	PAN, TILT, ZOOM CAMERA
PVC	POLYVINYL CHLORIDE
PWR	POWER
RSC	RIGID GALVANIZED STEEL CONDUIT
RTS	REMOTE TEST SWITCH
RVNR	REDUCED VOLTAGE NON-REVERSING
RVSS	REDUCED VOLTAGE SOLID STATE
SC	SHORT CIRCUIT
SCADA	SUPERVISORY CONTROL AND DATA
SCC	SUPERVISORY CONTROL CENTER
SE	SERVICE ENTRANCE
SEC	SECONDARY
SH	SHIELDED
SS	STAINLESS STEEL
STP	SHIELDED TWISTED PAIR
SV	SOLENOID VALVE
SW	SWITCH
TEL	TELEPHONE
TS2W	TWO SPEED TWO WINDING
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UPS	UNINTERRUPTIBLE POWER SUPPLY
UTP	UNSHIELDED TWISTED PAIR
V	VOLTS
VFD	VARIABLE FREQUENCY DRIVE
W	WIRE OR WATT
WD	HIGH PRESSURE WASH DOWN
WL	WET LOCATION
WP	WEATHERPROOF
XFMR	TRANSFORMER
XP	EXPLOSION PROOF
Y	WYE

DATE:

REVISIONS

NO.

ABBREVIATIONS

917 EAST MIFFLIN STREET
CITY OF MADISON
MADISON, WISCONSIN

JOB NO.
1020.074

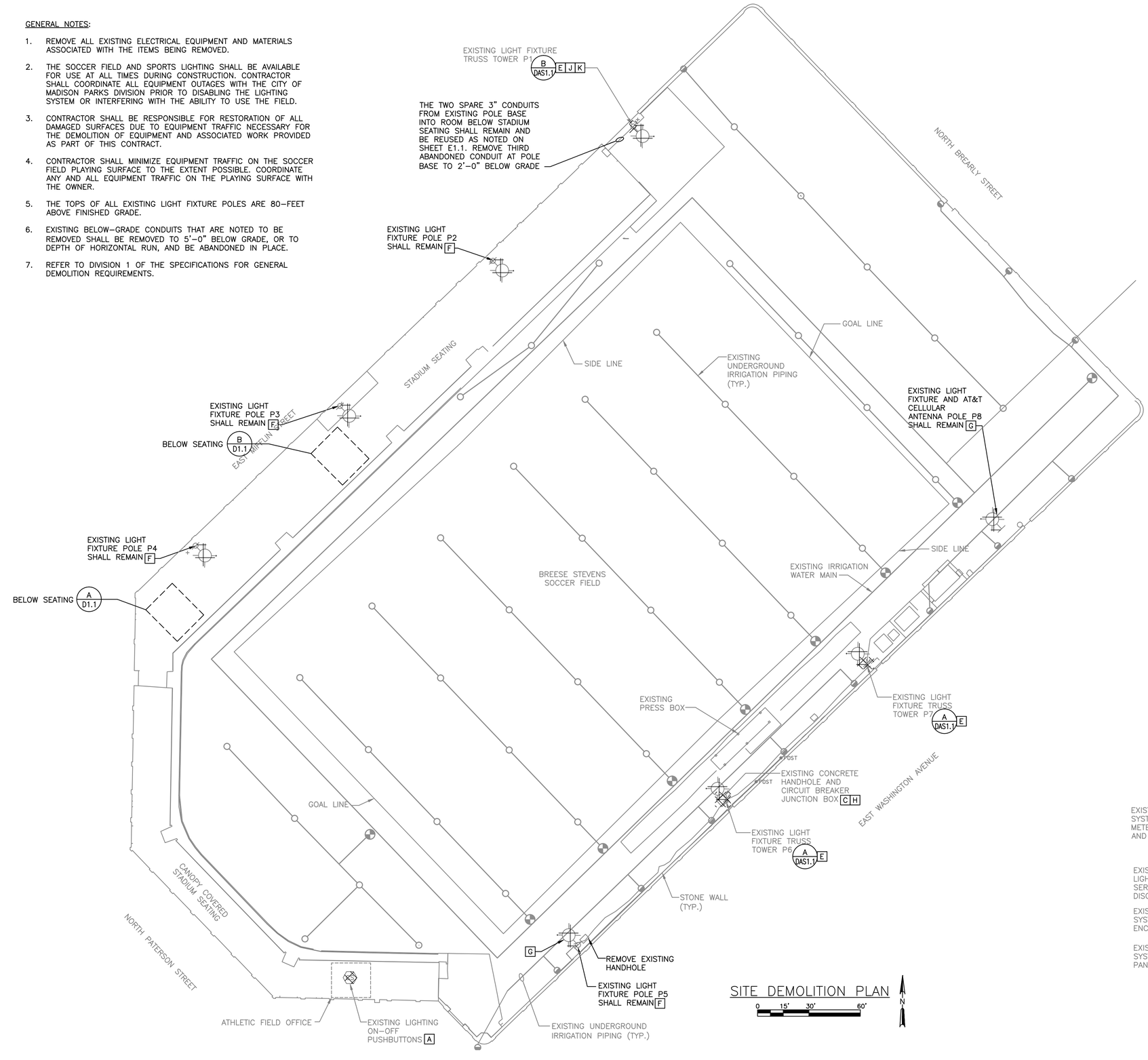
PROJECT MGR.
DAVE GOHDES

STRAND ASSOCIATES®

SHEET
3
G0.3

GENERAL NOTES:

1. REMOVE ALL EXISTING ELECTRICAL EQUIPMENT AND MATERIALS ASSOCIATED WITH THE ITEMS BEING REMOVED.
2. THE SOCCER FIELD AND SPORTS LIGHTING SHALL BE AVAILABLE FOR USE AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL COORDINATE ALL EQUIPMENT OUTAGES WITH THE CITY OF MADISON PARKS DIVISION PRIOR TO DISABLING THE LIGHTING SYSTEM OR INTERFERING WITH THE ABILITY TO USE THE FIELD.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORATION OF ALL DAMAGED SURFACES DUE TO EQUIPMENT TRAFFIC NECESSARY FOR THE DEMOLITION OF EQUIPMENT AND ASSOCIATED WORK PROVIDED AS PART OF THIS CONTRACT.
4. CONTRACTOR SHALL MINIMIZE EQUIPMENT TRAFFIC ON THE SOCCER FIELD PLAYING SURFACE TO THE EXTENT POSSIBLE. COORDINATE ANY AND ALL EQUIPMENT TRAFFIC ON THE PLAYING SURFACE WITH THE OWNER.
5. THE TOPS OF ALL EXISTING LIGHT FIXTURE POLES ARE 80–FEET ABOVE FINISHED GRADE.
6. EXISTING BELOW–GRADE CONDUITS THAT ARE NOTED TO BE REMOVED SHALL BE REMOVED TO 5'–0" BELOW GRADE, OR TO DEPTH OF HORIZONTAL RUN, AND BE ABANDONED IN PLACE.
7. REFER TO DIVISION 1 OF THE SPECIFICATIONS FOR GENERAL DEMOLITION REQUIREMENTS.



SITE DEMOLITION PLAN
0 15' 30' 60'
N

DEMOLITION NOTES:

A REMOVE EXISTING LIGHTING SYSTEM CONTACTOR ENCLOSURE. ALTER AND EXTEND EXISTING 4~350MCM CONDUCTORS AND #3 GROUND IN 3 1/2" CONDUIT FROM EXISTING CT CABINET TO EXISTING LIGHTING SYSTEM DISTRIBUTION PANEL MAIN LUGS. SEE DRAWING E5.1 FOR THE ELECTRICAL ONE–LINE DIAGRAM. REMOVE ALL ASSOCIATED CONTROL CONDUIT AND WIRING FROM CONTACTOR ENCLOSURE TO LIGHTING CONTROL SWITCH IN THE ATHLETIC FIELD OFFICE.

B EXISTING 800 AMP, 277/480V LIGHTING SYSTEM DISTRIBUTION PANEL, CUTLER HAMMER TYPE EE PANELBOARD, CATALOG NO. EEI323S08A. PANEL HAS ONE EXISTING 200 AMP AND FOUR EXISTING 60 AMP 3–POLE CIRCUIT BREAKERS. REMOVE ALL EXISTING CIRCUIT BREAKERS AND COVER PLATES AS REQUIRED FOR INSTALLATION OF NEW CIRCUIT BREAKERS SHOWN ON DRAWING E5.1.

C REMOVE EXISTING CONCRETE HANDHOLE AND ASSOCIATED CIRCUIT BREAKER JUNCTION BOX. REMOVE ALL ASSOCIATED CONDUIT AND WIRING BACK TO THE LIGHTING DISTRIBUTION PANEL. BACKFILL AND RESTORE TO MATCH EXISTING GRADE.

D RELOCATE EXISTING ELECTRIC UNIT HEATER EUH–3 NORTH WHERE SHOWN ON SHEET E1.2 AS REQUIRED TO MAKE SPACE FOR NEW WALL–MOUNTED SOUND SYSTEM AMPLIFIER RACK. PROVIDE 3~#8 CONDUCTORS AND #10 GROUND IN 3/4" CONDUIT FROM EXISTING CIRCUIT BREAKER IN PANEL J1 TO RELOCATED EUH–3.

E REMOVE EXISTING TRUSS TOWER, LIGHT FIXTURES, AND ALL ASSOCIATED HARDWARE AND EQUIPMENT. REMOVE ALL ASSOCIATED CONDUIT AND WIRING BACK TO THE LIGHTING DISTRIBUTION PANEL. SEE SHEET DAS1.1 FOR ANCHOR BOLT REPAIR.

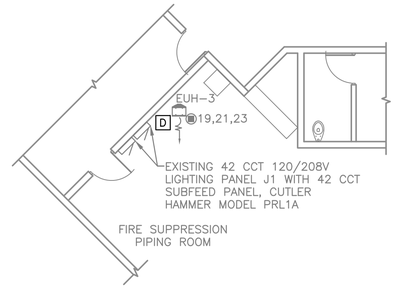
F REMOVE EXISTING LIGHT FIXTURES AND ALL ASSOCIATED HARDWARE AND EQUIPMENT. REMOVE ALL ASSOCIATED CONDUIT AND WIRING BACK TO THE LIGHTING DISTRIBUTION PANEL. REMOVE ALL SUPPORT HARDWARE AND WALKWAYS FROM TOP OF POLE AND PROVIDE GALVANIZED STEEL CAP ON TOP OF POLE TO SEAL WATERTIGHT.

G REMOVE LIGHT FIXTURE CROSS ARM ASSEMBLY AND ASSOCIATED HARDWARE AND EQUIPMENT FROM EXISTING POLE. POLE SHALL REMAIN FOR INSTALLATION OF NEW LIGHT FIXTURE ASSEMBLY. REMOVE ALL ASSOCIATED LIGHT FIXTURE CONDUIT AND WIRING BACK TO THE LIGHTING DISTRIBUTION PANEL. THE EXISTING AT&T CELLULAR ANTENNAS AND ALL ASSOCIATED CONDUIT, WIRING, HARDWARE, AND EQUIPMENT SHALL REMAIN. CELLULAR ANTENNA SERVICE SHALL BE OPERATIONAL AT ALL TIMES DURING CONSTRUCTION. COORDINATE ALL DEMOLITION WORK WITH MIKE JANSEN AT AT&T (262–785–7102) PRIOR TO DEMOLITION OF LIGHTING EQUIPMENT.

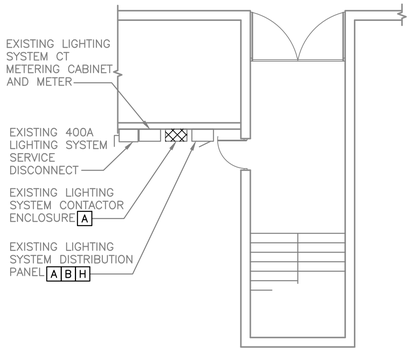
H REMOVE EXISTING 200 AMP FEEDER FROM EXISTING LIGHTING SYSTEM DISTRIBUTION PANEL TO EXISTING HANDHOLE WITH CIRCUIT BREAKER JUNCTION BOX AT LIGHT FIXTURE TRUSS TOWER. REMOVE ALL ASSOCIATED CONDUCTORS. REMOVE CONDUIT TO EXTERIOR WALL AND CAP.

J REMOVE EXISTING ASPHALT AS REQUIRED FOR SIDEPLATE INSTALLATION.

K REMOVE EXISTING GALVANIZED PIPE FENCE.



A D1.1 ENLARGED DEMOLITION PLAN NO. 1
NO SCALE



B D1.1 ENLARGED DEMOLITION PLAN NO. 2
NO SCALE

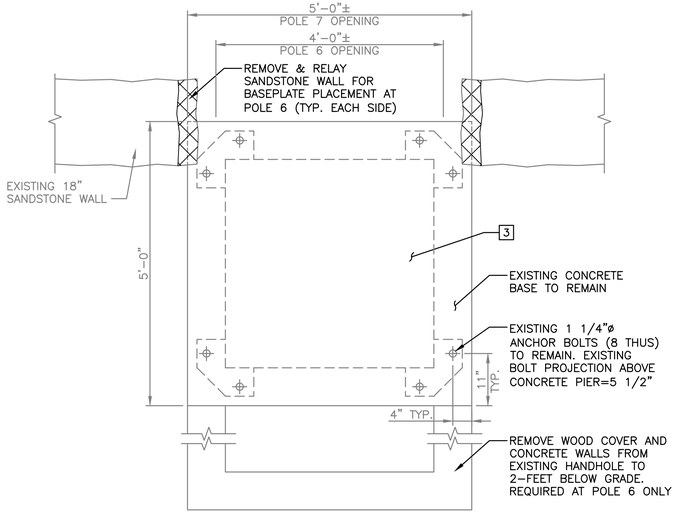
NO.	REVISIONS	DATE:

BREESE STEVENS FIELD
DEMOLITION PLAN
917 EAST MIFFLIN STREET
CITY OF MADISON
MADISON, WISCONSIN

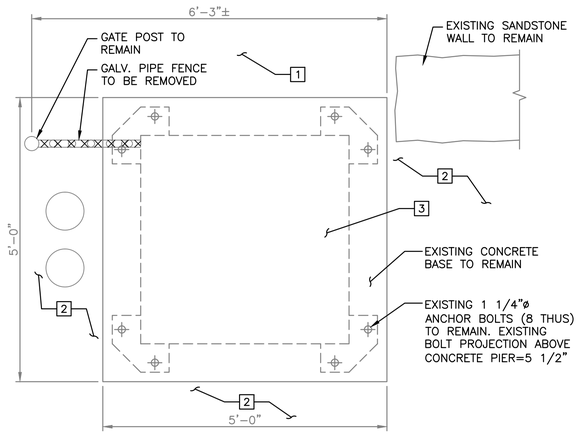
JOB NO. 1020.074
PROJECT MGR. DAVE GOHDES

STRAND ASSOCIATES®

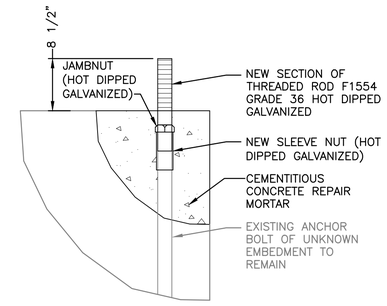
SHEET 4
D1.1



A DEMOLITION PLAN
DAS1.1 POLE 6 (P6), POLE 7 (P7)
0 1' 2'



B DEMOLITION PLAN
DAS1.1 POLE 1 (P1)
0 1' 2'



E ANCHOR BOLT REPAIR
DAS1.1 NO SCALE

NOTES:

1. VERIFY CONDITION OF EXISTING ANCHOR BOLT BEFORE PROCEEDING WITH FOLLOWING.
2. CHIP AWAY CORNERS OF EXISTING PIERS TO EXPOSE ANCHOR BOLTS. DO NOT DAMAGE BOLTS. USE CHIPPING HAMMER. CUT EXISTING ANCHOR BOLT TO ALLOW INSTALLATION OF SLEEVE NUT AND JAMBNUT.
3. THREAD EXPOSED PORTION OF EXISTING ROD FOR SLEEVE NUT. PROVIDE SLEEVE NUTS TO MATCH BOLT SIZE. SOLVENT CLEAN AND COAT ENTIRE ASSEMBLY WITH ZINC RICH COATING.
4. EXTEND ANCHOR BOLTS WITH NEW THREADED ANCHOR ROD AS SHOWN.
5. REPLACE CONCRETE WITH CEMENTITIOUS CONCRETE REPAIR MORTAR.

DEMOLITION KEY NOTES:

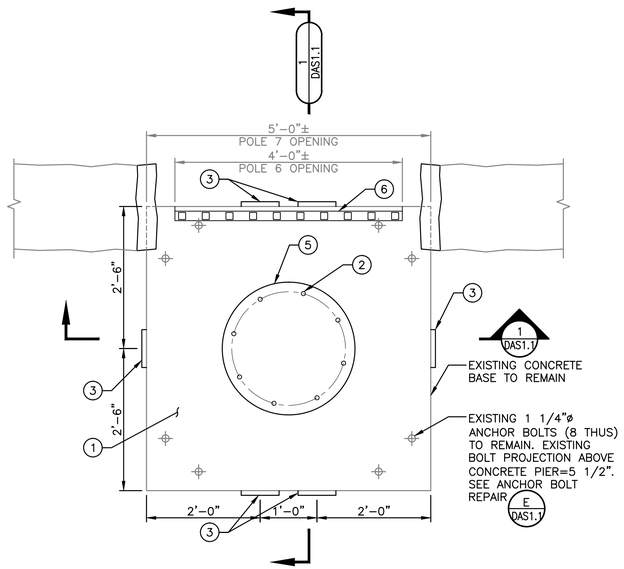
1. REMOVE SIDEWALK AS REQUIRED FOR SIDE PLATE INSTALLATION. BACKFILL WITH COMPACTED GRANULAR MATERIAL AND REPLACE SIDEWALK TO MATCH EXISTING.
2. REMOVE ASPHALT AS REQUIRED FOR SIDE PLATE INSTALLATION. BACKFILL WITH COMPACTED GRANULAR MATERIAL AND REPLACE ASPHALT TO MATCH EXISTING.
3. REMOVE EXISTING LIGHT POLE, BASE, CONDUIT, ELECTRICAL BOXES, AND ENCLOSURE.

GENERAL NOTES:

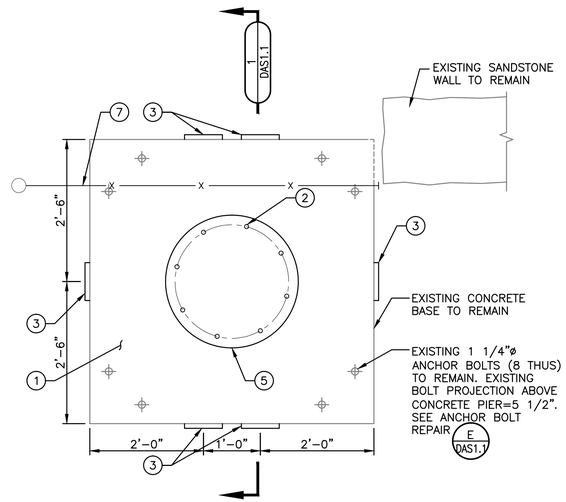
1. SEE SHEET E1.1 FOR POLE LOCATIONS.
2. FIELD TOUCH UP ALL DAMAGED GALVANIZED MATERIALS PER SPECIFICATIONS.

KEY NOTES:

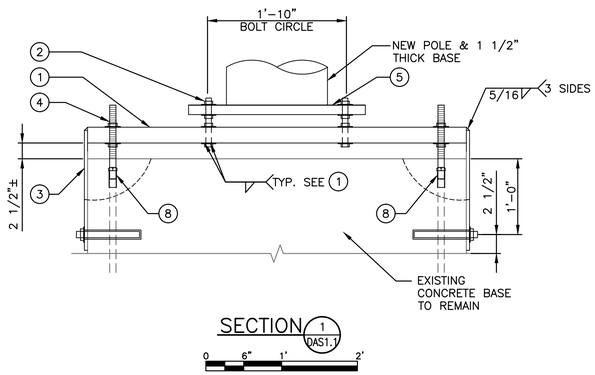
1. NEW 2 1/2" THICK LOWER STEEL (A36) BASE PLATE. ACCURATELY MEASURE EXISTING PIER SIZE AND EXISTING ANCHOR BOLT LOCATIONS AND MATCH SIZE SUCH THAT SIDE PLATES CAN BE INSTALLED. PROVIDE GALVANIZED A325 BOLT/NUTS/WASHERS TO ANCHOR NEW POLE BASE. WELD BOLT HEAD TO UNDERSIDE OF BASE PLATE THROUGH STD. WASHER ON TWO OPPOSITE FLATS. HOT DIP GALVANIZE PLATE ASSEMBLY. PROVIDE 6" DIAMETER HOLE IN CENTER OF PLATE WITH EASED EDGES FOR ELECTRICAL WIRE PASSAGE. NO GROUT SHALL BE PLACED BELOW THIS PLATE.
2. 8~7/8" DIA. A325 BOLTS WITH UPPER AND LOWER NUTS/WASHERS FOR LEVELING. ALL BOLTS, NUTS, AND WASHERS SHALL BE HOT DIPPED GALVANIZED.
3. SIDE PLATES SHOP WELDED TO LOWER BASE PLATE. AFTER LEVELING BASE PLATE, CONNECT SIDE PLATE TO EXISTING PIER WITH 1" DIAMETER ADHESIVE ANCHOR. BOLT/NUT/WASHER TO BE STAINLESS STEEL ASTM 304. EMBED 8 1/4" INTO CONCRETE. COAT ASSEMBLY BELOW GRADE WITH ASPHALT PAINT. SIDE PLATES TO BE 1/2" THICK x 4" WIDE, HOT DIPPED GALVANIZED.
4. 1 1/4" DIA HOT DIPPED GALVANIZED THREADED ANCHOR BOLT. PROVIDE DOUBLE NUTS/WASHERS FOR LEVELING. WASHERS ARE 1/4" HOT DIPPED GALVANIZED PLATE WASHERS WITH HOLE = BOLT DIAMETER + 1/16" COMBINED WITH STD. CUT HOT DIPPED GALVANIZED WASHERS. HOT DIP GALVANIZE ENTIRE ASSEMBLY.
5. 1 1/2" x 2'-4" DIA POLE BASE PLATE SUPPLIED BY LIGHT MANUFACTURER.
6. NEW DECORATIVE FENCE BY OWNER.
7. NEW CHAIN LINK FENCE BY OWNER.
8. ANCHOR BOLT REPAIR (E / DAS1.1).



C PLAN OF NEW POLE BASE
DAS1.1 POLE 6 (P6), POLE 7 (P7)
0 1' 2'



D PLAN OF NEW POLE BASE
DAS1.1 POLE 1 (P1)
0 1' 2'



SECTION 1 / DAS1.1
0 6" 1' 2'

DATE: | REVISIONS | NO.

BREESE STEVENS FIELD
LIGHT POLE BASE PLANS, SECTIONS, AND DETAILS

917 EAST MIFFLIN STREET
CITY OF MADISON
MADISON, WISCONSIN

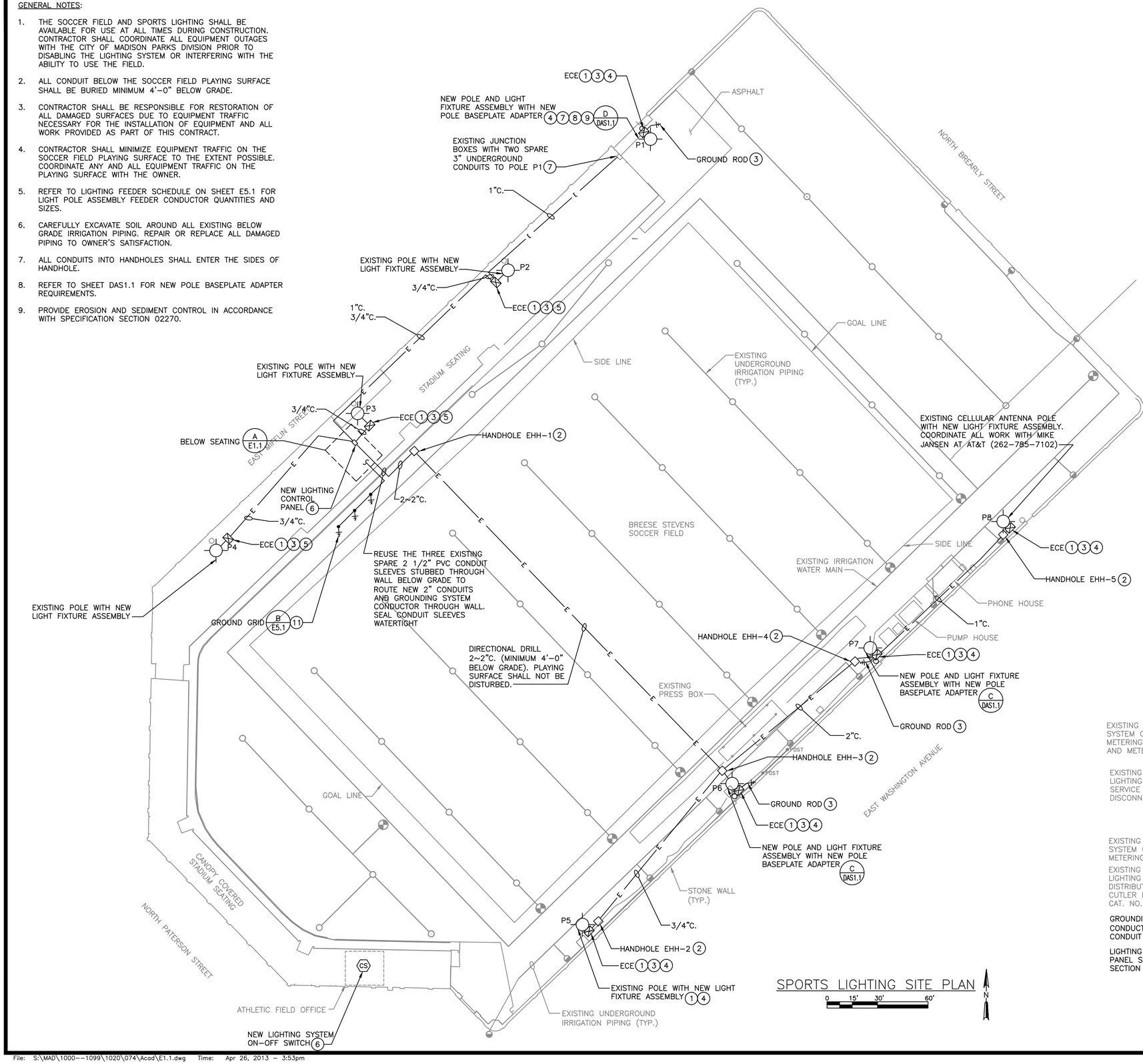
JOB NO. 1020.074
PROJECT MGR. DAVE GOHDES

STRAND ASSOCIATES®

SHEET 5
DAS1.1

GENERAL NOTES:

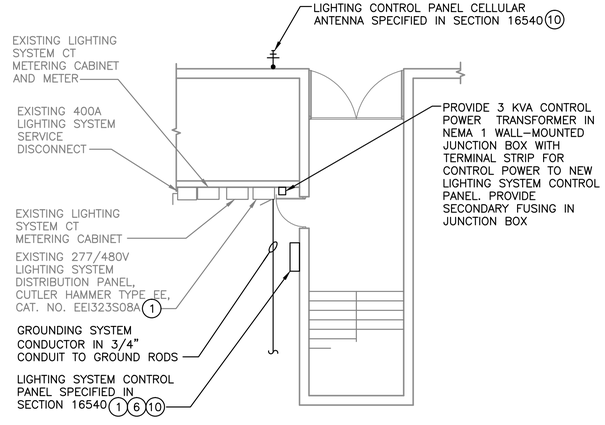
1. THE SOCCER FIELD AND SPORTS LIGHTING SHALL BE AVAILABLE FOR USE AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL COORDINATE ALL EQUIPMENT OUTAGES WITH THE CITY OF MADISON PARKS DIVISION PRIOR TO DISABLING THE LIGHTING SYSTEM OR INTERFERING WITH THE ABILITY TO USE THE FIELD.
2. ALL CONDUIT BELOW THE SOCCER FIELD PLAYING SURFACE SHALL BE BURIED MINIMUM 4'–0" BELOW GRADE.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORATION OF ALL DAMAGED SURFACES DUE TO EQUIPMENT TRAFFIC NECESSARY FOR THE INSTALLATION OF EQUIPMENT AND ALL WORK PROVIDED AS PART OF THIS CONTRACT.
4. CONTRACTOR SHALL MINIMIZE EQUIPMENT TRAFFIC ON THE SOCCER FIELD PLAYING SURFACE TO THE EXTENT POSSIBLE. COORDINATE ANY AND ALL EQUIPMENT TRAFFIC ON THE PLAYING SURFACE WITH THE OWNER.
5. REFER TO LIGHTING FEEDER SCHEDULE ON SHEET E5.1 FOR LIGHT POLE ASSEMBLY FEEDER CONDUCTOR QUANTITIES AND SIZES.
6. CAREFULLY EXCAVATE SOIL AROUND ALL EXISTING BELOW GRADE IRRIGATION PIPING. REPAIR OR REPLACE ALL DAMAGED PIPING TO OWNER'S SATISFACTION.
7. ALL CONDUITS INTO HANDHOLES SHALL ENTER THE SIDES OF HANDHOLE.
8. REFER TO SHEET DAS1.1 FOR NEW POLE BASEPLATE ADAPTER REQUIREMENTS.
9. PROVIDE EROSION AND SEDIMENT CONTROL IN ACCORDANCE WITH SPECIFICATION SECTION 02270.



SPORTS LIGHTING SITE PLAN
0 15' 30' 60'
N

KEY NOTES:

1. ALL LIGHT FIXTURE ELECTRICAL COMPONENT ENCLOSURES SHALL BE POWERED FROM NEW CIRCUIT BREAKERS IN THE EXISTING LIGHTING SYSTEM DISTRIBUTION PANEL THROUGH CONTACTORS IN THE NEW LIGHTING SYSTEM CONTROL PANEL.
2. PROVIDE MINIMUM 6 FEET OF PVC–COATED RGS CONDUIT FOR ALL CONDUITS OUT OF HANDHOLES BEFORE TRANSITIONING TO PVC CONDUIT.
3. PROVIDE ONE GROUND ROD AT EACH NEW POLE LOCATION. GROUND ROD CONDUCTOR SHALL BE 2/0 BARE COPPER AND INSTALLED THROUGH LUG IN POLE AND BE ROUTED INSIDE POLE CONTINUOUS TO THE ELECTRICAL COMPONENT ENCLOSURE. FOR EXISTING POLES, PROVIDE 2/0 GROUND CONDUCTOR IN 3/4" SCHEDULE 80 PVC CONDUIT FROM GROUND LUG TO ELECTRICAL COMPONENT ENCLOSURE.
4. CONTRACTOR SHALL MOUNT ELECTRICAL COMPONENT ENCLOSURE (ECE) 10'–0" ABOVE FINISHED GRADE. PROVIDE STAINLESS STEEL MOUNTING HARDWARE. COORDINATE EXACT MOUNTING LOCATION WITH MANUFACTURED OPENING IN NEW POLES. REFER TO DETAIL A E5.1 FOR MOUNTING ECE ON EXISTING AND NEW POLES.
5. ELECTRICAL COMPONENT ENCLOSURE (ECE) SHALL BE MOUNTED BELOW THE STADIUM SEATING DECKING. PROVIDE 1" CONDUIT FROM ECE AND INTERCEPT EXISTING CONDUIT INTO POLE FOR NEW SECTION 16540 SUPPLIER FURNISHED CABLE FROM ECE TO LIGHT FIXTURES. ROUTE CONDUIT FROM ECE TO EXISTING POLE–MOUNTED JUNCTION BOXES.
6. PROVIDE LIGHTING SYSTEM REMOTE ON–OFF SELECTOR SWITCH IN SURFACE MOUNTED JUNCTION BOX IN THE ATHLETIC FIELD OFFICE. SELECTOR SWITCH SHALL BE SQUARE–D CLASS 9001 TYPE SKY, ALLEN BRADLEY BULLETIN 800T, OR EQUAL. COORDINATE MOUNTING LOCATION IN OFFICE WITH OWNER PRIOR TO INSTALLATION. PROVIDE 2–#12 IN 3/4" CONDUIT FROM SELECTOR SWITCH TO NEW LIGHTING CONTROL PANEL.
7. ROUTE NEW CONDUIT FOR POLE P1 ELECTRICAL COMPONENT ENCLOSURE TO EXISTING JUNCTION BOXES THAT HAVE TWO SPARE 3" UNDERGROUND CONDUITS TO JUNCTION BOXES LOCATED AT POLE P1 BASE. REPLACE EXISTING POLE BASE JUNCTION BOXES WITH A NEW NEMA 4X STAINLESS STEEL JUNCTION BOX AND REUSE EXISTING UNDERGROUND CONDUIT FOR NEW POLE P1 BRANCH CIRCUIT CONDUCTORS TO POLE–MOUNTED ECE.
8. EXISTING POLE BASE IS SURROUNDED BY ASPHALT AND CONCRETE SIDEWALK. EXCAVATE AND RESTORE ASPHALT AND CONCRETE SIDEWALK TO MATCH EXISTING AS REQUIRED FOR NEW POLE BASEPLATE ADAPTER INSTALLATION.
9. EXISTING POLE BASE IS SURROUNDED BY GRASS AND SIDEWALK. EXCAVATE AND RESTORE SIDEWALK TO MATCH EXISTING AS REQUIRED FOR NEW POLE BASEPLATE ADAPTER INSTALLATION.
10. MOUNT LIGHTING CONTROL PANEL CELLULAR ANTENNA ON EXTERIOR WALL 10'–0" AFG. PROVIDE MANUFACTURER FURNISHED ANTENNA CABLE IN 3/4" CONDUIT FROM ANTENNA TO LIGHTING CONTROL PANEL. PROVIDE COOPER CGB FITTING AND DRIP LOOP AT ANTENNA TO SEAL CONDUIT WATERTIGHT. PROVIDE STAINLESS STEEL MOUNTING HARDWARE.
11. IN LIEU OF PROVIDING A NEW GROUNDING SYSTEM FOR THE LIGHTING DISTRIBUTION PANEL, CONTRACTOR MAY TEST AND REUSE THE EXISTING GROUNDING SYSTEM IF A GOOD EARTH GROUND IS IN PLACE. CONTRACTOR SHALL INCLUDE NEW GROUND SYSTEM IN THE BID.



A E1.1 ENLARGED PLAN
NO SCALE

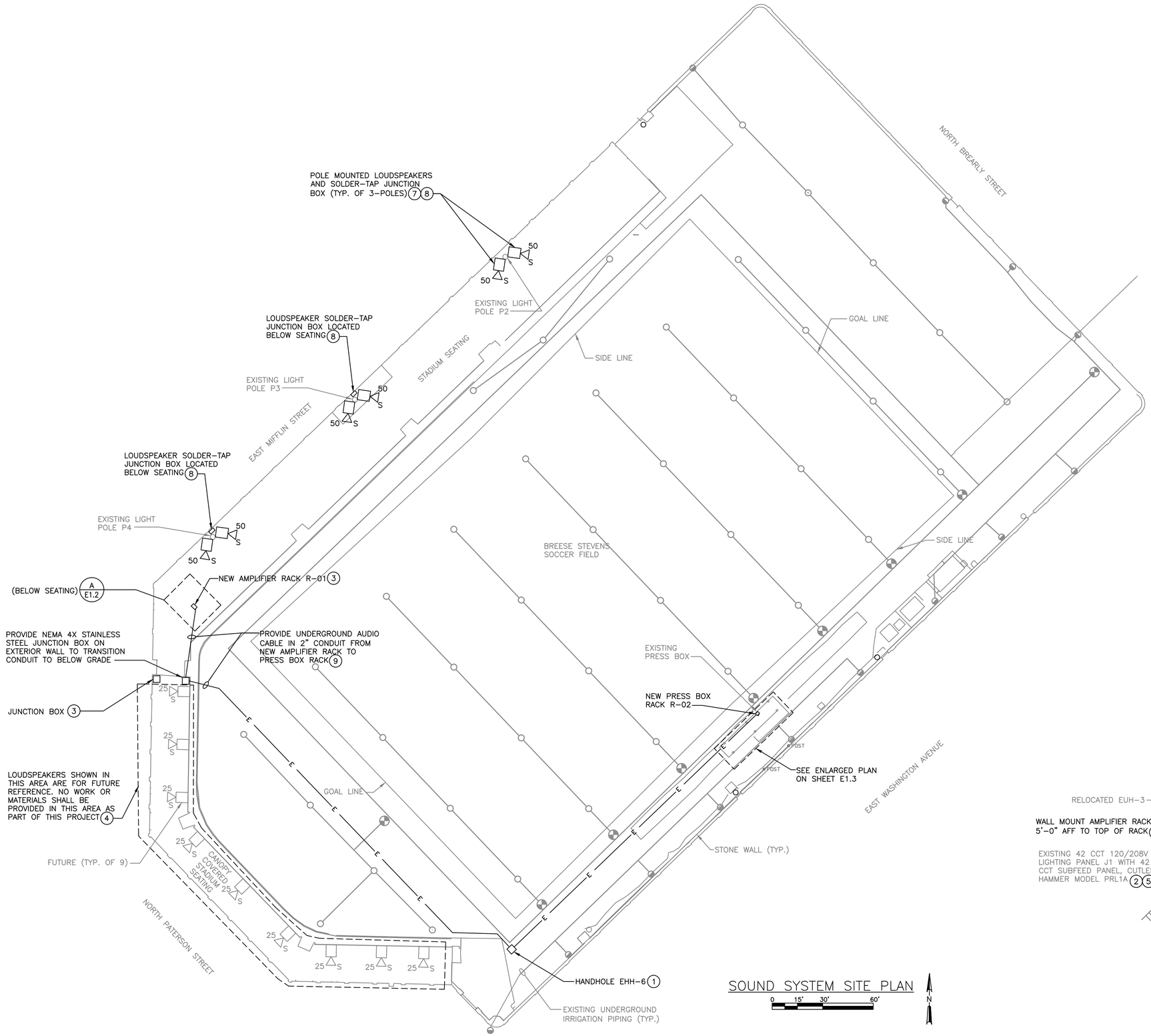
NO.	REVISIONS	DATE:

BREESE STEVENS FIELD
SPORTS LIGHTING SITE PLAN
917 EAST MIFFLIN STREET
CITY OF MADISON
MADISON, WISCONSIN

JOB NO. 1020.074
PROJECT MGR. DAVE GOHDES

STRAND ASSOCIATES®

SHEET 6 E1.1



SOUND SYSTEM SITE PLAN

0 15' 30' 60'

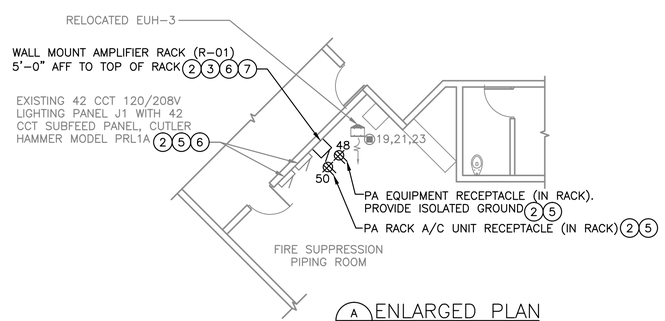
N

GENERAL NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORATION OF ALL DAMAGED SURFACES DUE TO EQUIPMENT TRAFFIC NECESSARY FOR INSTALLATION OF EQUIPMENT AND ALL WORK PROVIDED AS PART OF THIS CONTRACT.
2. CONTRACTOR SHALL MINIMIZE EQUIPMENT TRAFFIC ON THE SOCCER FIELD PLAYING SURFACE TO THE EXTENT POSSIBLE. COORDINATE ANY AND ALL EQUIPMENT TRAFFIC ON THE PLAYING SURFACE WITH THE OWNER.
3. REFER TO PA SYSTEM RISER ON SHEET E6.1 FOR ALL REQUIRED SIGNAL AND LOUDSPEAKER CONDUIT AND WIRE.
4. THE TOPS OF ALL EXISTING LIGHT FIXTURE POLES ARE 80-FEET ABOVE FINISHED GRADE.
5. CAREFULLY EXCAVATE SOIL AROUND ALL EXISTING BELOW GRADE IRRIGATION PIPING. REPAIR OR REPLACE ALL DAMAGED PIPING TO OWNER'S SATISFACTION.
6. ALL CONDUITS INTO HANDHOLES SHALL ENTER THE SIDES OF HANDHOLE.

KEY NOTES:

1. PROVIDE MINIMUM 6 FEET OF PVC-COATED RGS CONDUIT FOR ALL CONDUITS OUT OF HANDHOLES BEFORE TRANSITIONING TO PVC CONDUIT.
2. PROVIDE 2~#12 AND #12 GROUND IN 3/4" CONDUIT FROM SPARE 20 AMP SINGLE POLE CIRCUIT BREAKER IN EXISTING LIGHTING PANEL J1, CIRCUIT 48, TO NEW AMPLIFIER RACK FOR SOUND SYSTEM EQUIPMENT POWER. PROVIDE 2~#12 AND #12 GROUND IN 3/4" CONDUIT FROM SPARE 20 AMP SINGLE POLE CIRCUIT BREAKER IN EXISTING LIGHTING PANEL J1, CIRCUIT 50, TO NEW AMPLIFIER RACK FOR AIR CONDITIONER POWER.
3. PROVIDE A NEMA 4X STAINLESS STEEL JUNCTION BOX AT COVERED SEATING AREA CANOPY STRUCTURAL FRAME FOR FUTURE LOUDSPEAKER CONDUIT AND WIRING. PROVIDE ONE 3/4" CONDUIT FROM AMPLIFIER RACK TO JUNCTION BOX. ROUTE CONDUIT BELOW SEATING AND PENETRATE DECKING INSIDE EXTERIOR WALL. ROUTE CONDUIT TO BLEND INTO STRUCTURAL STEEL. PAINT ALL CONDUIT AND SUPPORTS TO MATCH ADJACENT STRUCTURE FINISH.
4. LAYOUT OF THE 9 FUTURE LOUDSPEAKERS WAS DESIGNED AROUND COMMUNITY LOUDSPEAKERS MODEL R.25-94TZ, MOUNTED ON THE CANOPY EDGE AT -45° DOWNWARD ANGLE. THE INTENT IS FOR THESE LOUDSPEAKERS TO BE POWERED FROM A DEDICATED AMPLIFIER CHANNEL SEPARATE FROM THE POLE MOUNTED LOUDSPEAKERS BEING INSTALLED AS PART OF THIS PROJECT.
5. ONE RECEPTACLE IS FOR THE AIR CONDITIONER AND THE OTHER IS AN ISOLATED GROUND TYPE RECEPTACLE FOR THE SOUND SYSTEM EQUIPMENT. THE RECEPTACLE SHALL BE BONDED WITH AN ISOLATED GROUNDING CONDUCTOR AND ALL OTHER RACEWAY COMPONENTS SHALL BE BONDED WITH A SEPARATE GROUND CONDUCTOR PER THE NEC.
6. PROVIDE INSULATED #6 GROUND CONDUCTOR IN 3/4" CONDUIT FROM FRAME OF RACK TO EXISTING LIGHTING PANEL J1.
7. MOUNT LOUDSPEAKERS ON EXISTING LIGHT POLES 40'-0" AFG WITH POLE MOUNTING BRACKETS AS SPECIFIED. PROVIDE EXTRA POLE MOUNTING BRACKET ABOVE LOUDSPEAKERS AND MANUFACTURER APPROVED STAINLESS STEEL SAFETY CABLE FROM BRACKET TO EACH LOUDSPEAKER PER MANUFACTURER'S RECOMMENDATIONS. SAFETY CABLE SHALL BE TAUT. LOUDSPEAKERS SHALL BE ANGLED DOWNWARD AT -45° ANGLE AND SEPARATED BY 80° OF SPLAY, AND CENTERED FACING THE FIELD. CONDUIT FROM AMPLIFIER RACK SHALL BE ROUTED BELOW SEATING TO SOLDER-TAP JUNCTION BOXES LOCATED BELOW THE STADIUM SEATING AT EACH POLE. CONDUIT SHALL PENETRATE DECKING BEHIND POLES INSIDE EXTERIOR WALL. ROUTE CONDUIT UP BACK SIDE OF POLE.
8. ALL SPEAKER TAPS SHALL BE SOLDERED WITH 63/37 ROSIN CORE SOLDER AS SPECIFIED. PROVIDE NEMA 4X SOLDER-TAP JUNCTION BOXES ON POLES NEAR LOUDSPEAKERS FOR SOLDER CONNECTION TO EACH MANUFACTURER FURNISHED LOUDSPEAKER CABLE. PROVIDE COOPER CGB FITTINGS ON BOTTOM OF POLE MOUNTED JUNCTION BOX FOR LOUDSPEAKER CABLES. COORDINATE FURNISHED LOUDSPEAKER CABLE LENGTH WITH LOUDSPEAKER MANUFACTURER. HEAT SHRINK ALL SOLDER CONNECTIONS AIR-TIGHT.
9. PROVIDE A NYLON PULL-CORD IN THE UNDERGROUND AUDIO CABLE CONDUIT TO FACILITATE FUTURE CABLE INSTALLATION.



A E1.2 ENLARGED PLAN
NO SCALE

NO.	REVISIONS	DATE:

BREESE STEVENS FIELD
SOUND SYSTEM SITE PLAN
917 EAST MIFFLIN STREET
CITY OF MADISON
MADISON, WISCONSIN

JOB NO. 1020.074
PROJECT MGR. DAVE GOHDES

STRAND ASSOCIATES®

SHEET 7 E1.2

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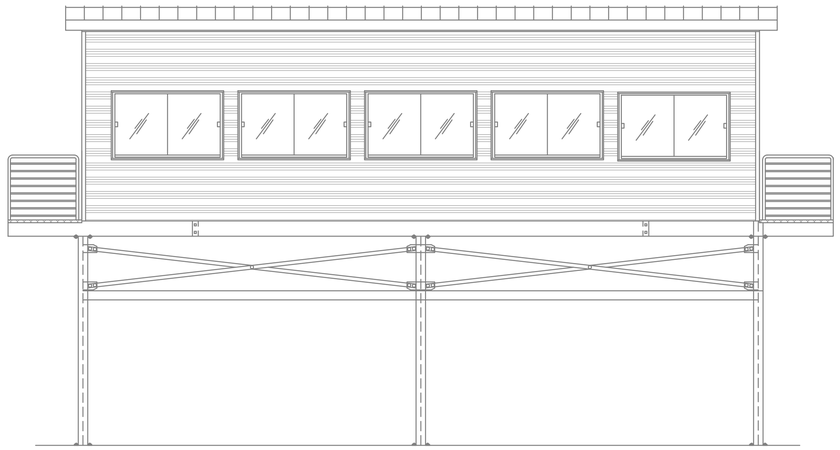


EXISTING PRESS BOX NORTH ELEVATION

0 1' 2' 4' 8'

GENERAL NOTES:

1. ALL EXTERIOR EXPOSED CONDUIT SHALL BE SCHEDULE 80 PVC, UNLESS OTHERWISE NOTED. ALL CONDUIT INSIDE THE PRESS BOX SHALL BE EMT, UNLESS OTHERWISE NOTED. PAINT INTERIOR EXPOSED CONDUIT TO MATCH FINISH ON ADJACENT SURFACE.
2. ALL CONDUITS SHALL ENTER BOTTOM OF PRESS BOX RACK.
3. ALL CONDUITS INTO THE PRESS BOX SHALL ENTER THROUGH THE FLOOR. SEAL PENETRATIONS AIR-TIGHT. CONDUIT PENETRATIONS INSIDE THE PRESS BOX SHALL BE PROPERLY SIZED AND MAINTAIN AN AESTHETICALLY PLEASING APPEARANCE.

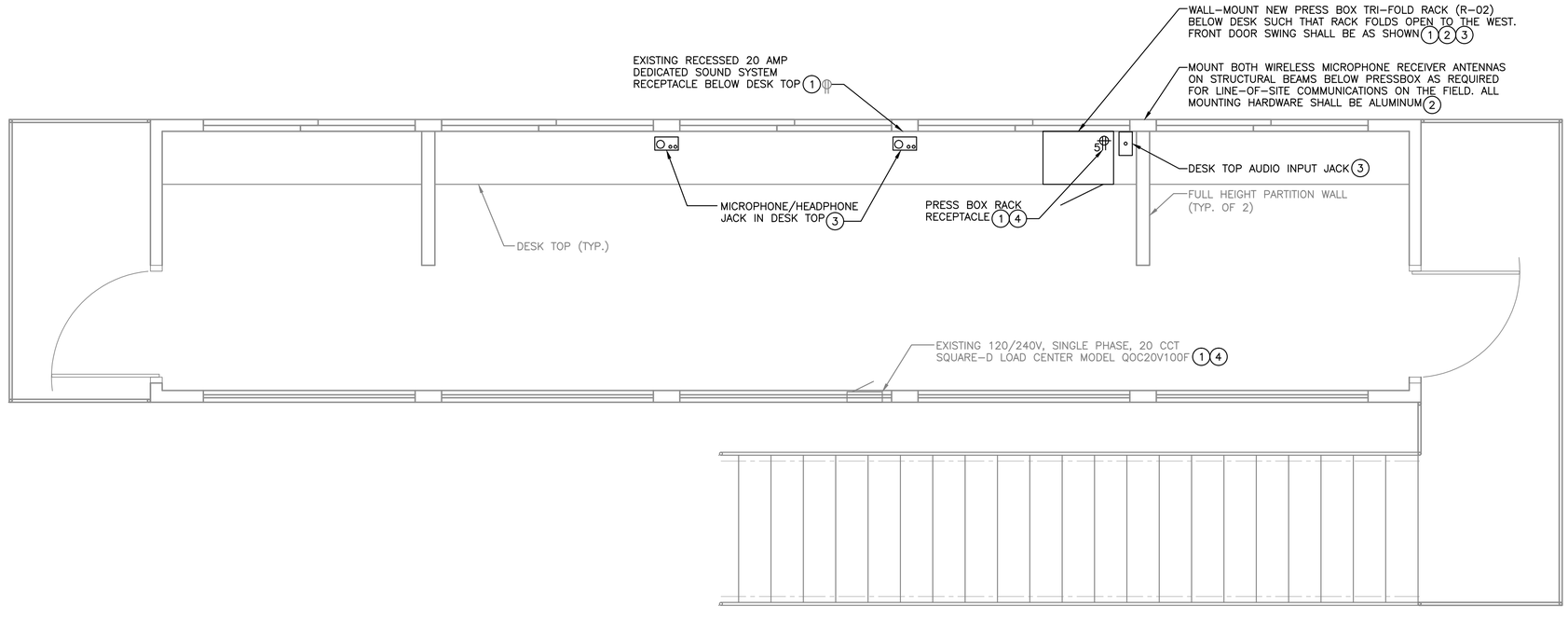
KEY NOTES:

(1) REMOVE EXISTING RECEPTACLE AND PROVIDE A NEW SURFACE MOUNTED JUNCTION BOX. PROVIDE 2~#12 AND #12 GROUND IN 3/4" CONDUIT FROM JUNCTION BOX TO PRESS BOX RACK RECEPTACLE. EXISTING RECESSED SOUND SYSTEM RECEPTACLE IS POWERED FROM A DEDICATED 20 AMP SINGLE POLE CIRCUIT BREAKER IN THE EXISTING 120/240V LOAD CENTER, CIRCUIT 5.

(2) PROVIDE TWO ANTENNA CABLES WITH BNC CONNECTIONS AS REQUIRED FROM RACK TO OUTDOOR ANTENNAS IN SEPARATE 3/4" CONDUITS. PROVIDE NEMA 4X PVC JUNCTION BOX BELOW PRESS BOX NEAR ANTENNAS WITH COOPER CGB FITTINGS FOR EACH CABLE ON BOTTOM OF JUNCTION BOX TO SEAL ANTENNA CABLES WATERTIGHT. CONDUITS SHALL PENETRATE PRESS BOX FLOOR INTO PRESS BOX INTERIOR DIRECTLY BELOW RACK. PROVIDE LB FITTINGS AT ALL CONDUIT BENDS.

(3) DRILL ACCESS HOLES IN DESK TOP FOR CABLES TO NEW MICROPHONE/HEADPHONE JACK FACEPLATES AND DESK TOP AUDIO INPUT JACK FACEPLATE. PROVIDE SINGLE-GANG OUTLET BOX MOUNTED TO BOTTOM OF DESK TOP FOR CONDUIT ENTRY AT EACH FACEPLATE. PROVIDE 3~AUDIO CABLES IN 1/2" CONDUIT FROM PRESS BOX RACK TO EACH MICROPHONE/HEADPHONE JACK FACEPLATE AND ONE AUDIO CABLE IN 1/2" CONDUIT TO THE AUDIO INPUT JACK FACEPLATE.

(4) PROVIDE A NEMA 4X PVC JUNCTION BOX MOUNTED ON FRAMING BELOW PRESS BOX FOR THE UNDERGROUND AUDIO CABLE CONDUIT FROM THE FIRE SUPPRESSION PIPING ROOM AMPLIFIER RACK, AS SHOWN ON SHEET E1.2. PROVIDE 3/4" CONDUIT FROM JUNCTION BOX TO PRESS BOX RACK. CONDUIT SHALL PENETRATE PRESS BOX FLOOR INTO PRESS BOX INTERIOR DIRECTLY BELOW RACK.



EXISTING PRESS BOX ENLARGED PLAN

0 1' 2' 4'

N

DATE:

REVISIONS

NO.

BREESE STEVENS FIELD
SOUND SYSTEM PLAN - EXISTING PRESS BOX

917 EAST MIFFLIN STREET
CITY OF MADISON
MADISON, WISCONSIN

JOB NO.
1020.074

PROJECT MGR.
DAVE GOHDES

STRAND ASSOCIATES®

SHEET
8
E1.3

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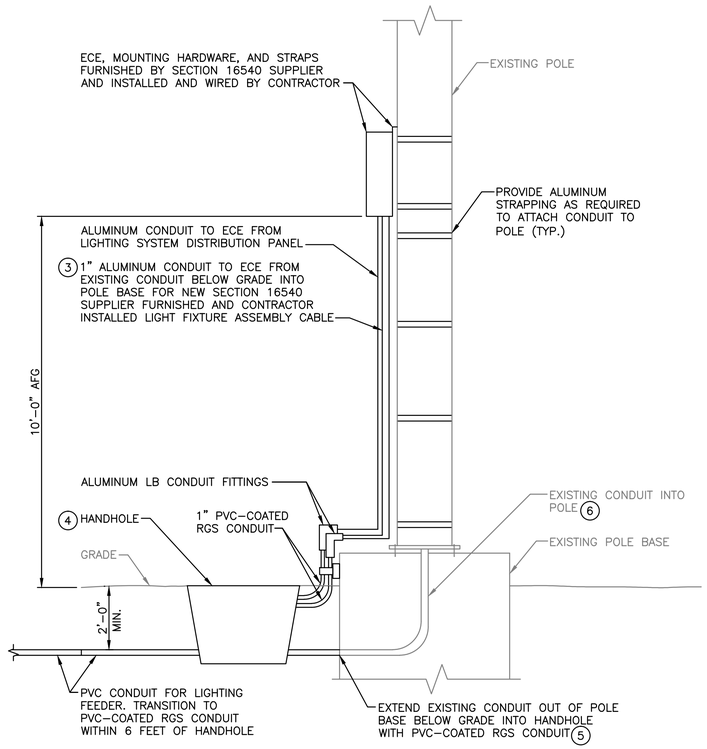
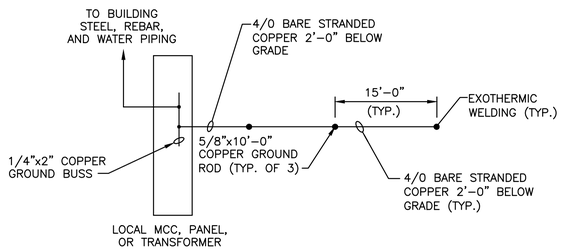


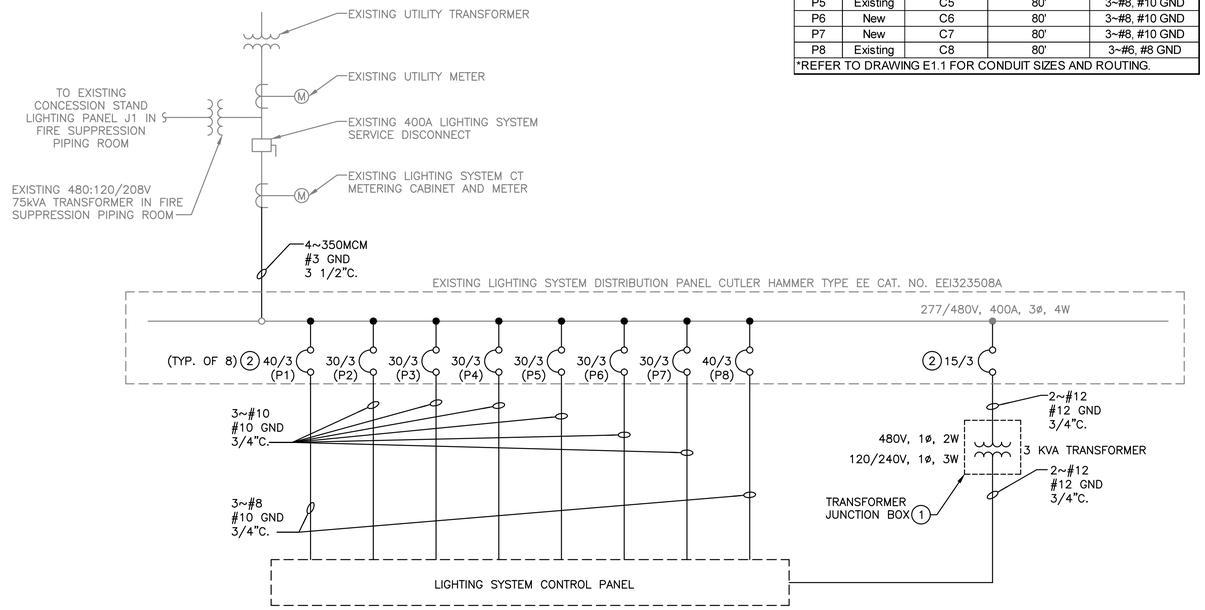
ELECTRICAL COMPONENT ENCLOSURE (ECE) MOUNTING ON EXISTING POLE

A / E5.1 NO SCALE



GROUND GRID

B / E5.1 NO SCALE



ELECTRICAL SYSTEM ONE-LINE DIAGRAM

NO SCALE

KEY NOTES:

1. PROVIDE SECONDARY FUSING IN JUNCTION BOX SIZED PER NEC.
2. PROVIDE EATON/CUTLER-HAMMER CIRCUIT BREAKERS MODEL EEFD340040A (40/3), MODEL EEFD340030A (30/3), AND MODEL EEFD340015A (15/3).
3. FOR NEW POLES ONLY, CABLE FROM FIXTURES SHALL BE ROUTED FROM INSIDE OF POLE THROUGH PASS-THROUGH HUB ON BACK OF ECE INTO POLE.
4. PROVIDE DIVIDED HANDHOLE TO PHYSICALLY SEPARATE LIGHTING FEEDER AND FIXTURE CABLE.
5. EXISTING POLE P8 DOES NOT HAVE A CONDUIT INTO THE BASE. PROVIDE CONDUIT INTO POLE THROUGH GAP BETWEEN POLE BOTTOM AND BASE.
6. EXISTING BASE FOR NEW POLE P1 DOES NOT HAVE AN EXISTING CONDUIT ENTRANCE. COORDINATE THREADED CONDUIT ENTRANCE INTO POLE WITH SECTION 16540 SYSTEM SUPPLIER.

LIGHTING FEEDER SCHEDULE

Pole No.	New/ Existing Pole	Lighting Control Panel Contactor	Fixture Assembly Height Above Playing Surface	Feeder Conductor Quantites and Sizes*
P1	New	C1	80'	3~#8, #10 GND
P2	Existing	C2	80'	3~#10, #10 GND
P3	Existing	C3	80'	3~#10, #10 GND
P4	Existing	C4	80'	3~#10, #10 GND
P5	Existing	C5	80'	3~#8, #10 GND
P6	New	C6	80'	3~#8, #10 GND
P7	New	C7	80'	3~#8, #10 GND
P8	Existing	C8	80'	3~#6, #8 GND

*REFER TO DRAWING E1.1 FOR CONDUIT SIZES AND ROUTING.

REVISIONS

NO.	DATE:

BREESE STEVENS FIELD
DETAILS, SCHEDULES, AND ELECTRICAL ONE-LINE DIAGRAM
917 EAST MIFFLIN STREET
CITY OF MADISON
MADISON, WISCONSIN

JOB NO. 1020.074

PROJECT MGR. DAVE GOHDES

STRAND ASSOCIATES®

SHEET 9 E5.1

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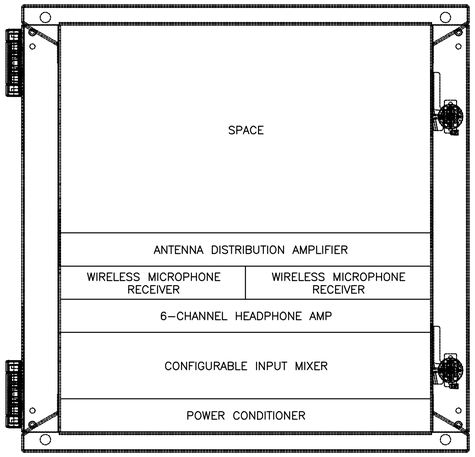
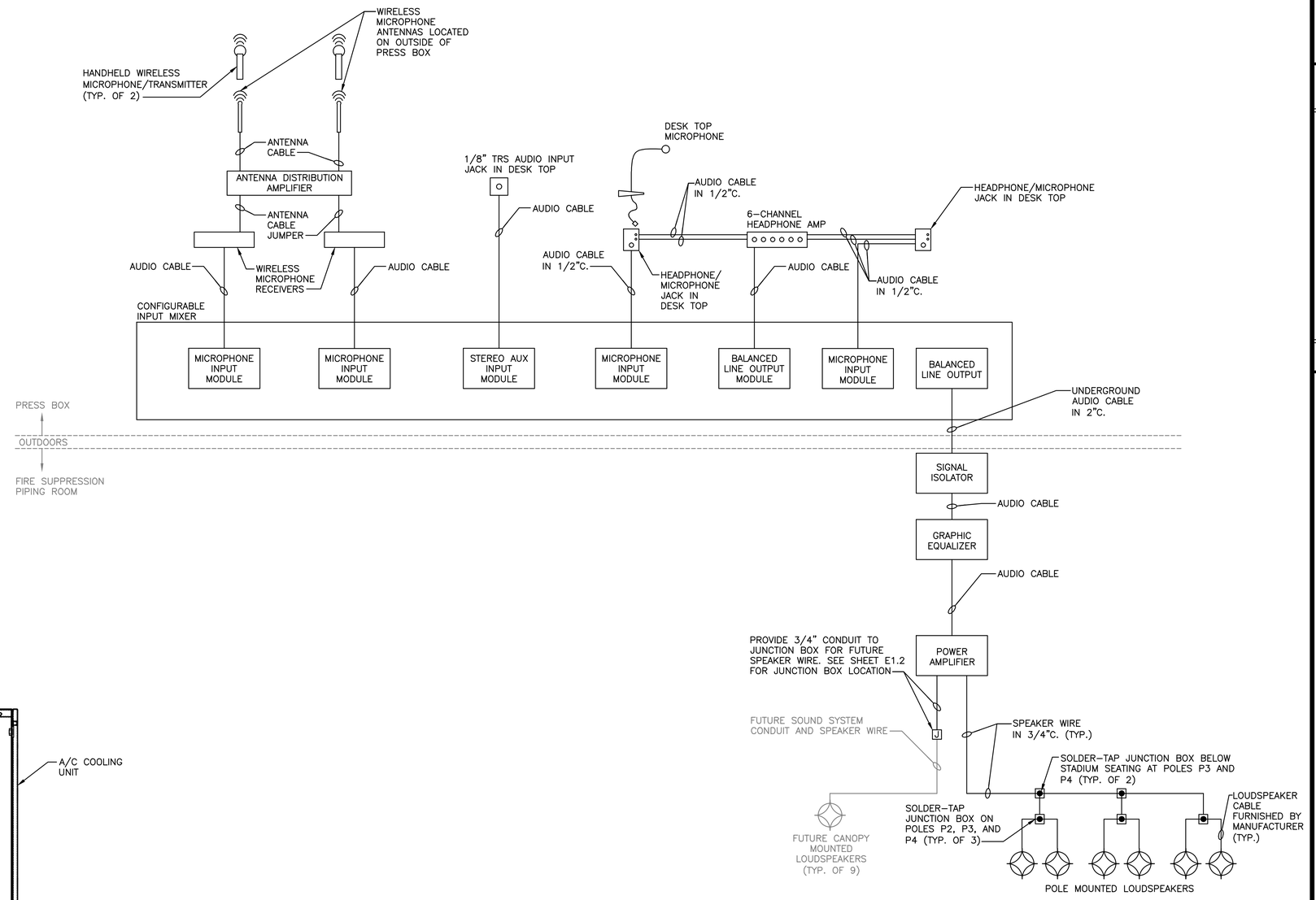
GENERAL NOTES:

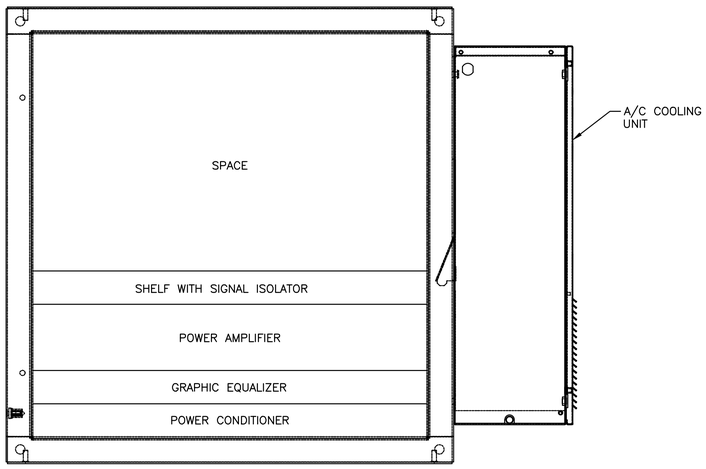
1. CONTRACTOR SHALL PROVIDE ALL AUDIO CABLE CONNECTORS AND TERMINATIONS REQUIRED FOR ALL AUDIO CABLE CONNECTIONS TO ALL SOUND SYSTEM EQUIPMENT, JACKS, AND DEVICES.



PRESS BOX RACK R-02
NO SCALE



SOUND SYSTEM RISER DIAGRAM
NO SCALE



AMPLIFIER RACK R-01
NO SCALE

DATE:
REVISIONS
NO.

BREESE STEVENS FIELD
SOUND SYSTEM RISER DIAGRAM
917 EAST MIFFLIN STREET
CITY OF MADISON
MADISON, WISCONSIN

JOB NO. 1020.074
PROJECT MGR. DAVE GOHDES

STRAND ASSOCIATES®

SHEET 10 E6.1

SECTION E: BIDDERS ACKNOWLEDGEMENT

BREESE STEVENS FIELD LIGHTING/SOUND SYSTEM IMPROVEMENTS
CONTRACT NO. 7044

Bidder must state a Unit Price and Total Bid for each item. The Total Bid for each item must be the product of quantity, by Unit Price. The Grand Total must be the sum of the Total Bids for the various items. In case of multiplication errors or addition errors, the Grand Total with corrected multiplication and/or addition shall determine the Grand Total bid for each contract. The Unit Price and Total Bid must be entered numerically in the spaces provided. All words and numbers shall be written in ink.

1. The undersigned having familiarized himself/herself with the Contract documents, including Advertisement for Bids, Instructions to Bidders, Form of Proposal, City of Madison Standard Specifications for Public Works Construction - 2013 Edition thereto, Form of Agreement, Form of Bond, and Addenda issued and attached to the plans and specifications on file in the office of the City Engineer, hereby proposes to provide and furnish all the labor, materials, tools, and expendable equipment necessary to perform and complete in a workmanlike manner the specified construction on this project for the City of Madison; all in accordance with the plans and specifications as prepared by the City Engineer, including Addenda to the Contract Nos. _____ through _____ issued thereto, at the prices for said work as contained in this proposal. (Electronic bids submittals shall acknowledge addendum under Section E and shall not acknowledge here)
2. If awarded the Contract, we will initiate action within seven (7) days after notification or in accordance with the date specified in the contract to begin work and will proceed with diligence to bring the project to full completion within the number of work days allowed in the Contract or by the calendar date stated in the Contract.
3. The undersigned Bidder or Contractor certifies that he/she is not a party to any contract, combination in form of trust or otherwise, or conspiracy in restraint of trade or commerce or any other violation of the anti-trust laws of the State of Wisconsin or of the United States, with respect to this bid or contract or otherwise.
4. I hereby certify that I have met the Bid Bond Requirements as specified in Section 102.5. *(IF BID BOND IS USED, IT SHALL BE SUBMITTED ON THE FORMS PROVIDED BY THE CITY. FAILURE TO DO SO MAY RESULT IN REJECTION OF THE BID).*
5. I hereby certify that all statements herein are made on behalf of _____ (name of corporation, partnership, or person submitting bid) a corporation organized and existing under the laws of the State of _____ a partnership consisting of _____; an individual trading as _____; of the City of _____ State of _____; that I have examined and carefully prepared this Proposal, from the plans and specifications and have checked the same in detail before submitting this Proposal; that I have fully authority to make such statements and submit this Proposal in (its, their) behalf; and that the said statements are true and correct.

_____
SIGNATURE

_____
TITLE, IF ANY

Sworn and subscribed to before me this _____ day of _____, 20_____.
(Notary Public or other officer authorized to administer oaths)
My Commission Expires _____
Bidders shall not add any conditions or qualifying statements to this Proposal.

SECTION F: DISCLOSURE OF OWNERSHIP & BEST VALUE CONTRACTING

BREESE STEVENS FIELD LIGHTING/SOUND SYSTEM IMPROVEMENTS CONTRACT NO. 7044

State of Wisconsin
Department of Workforce Development
Equal Rights Division
Labor Standards Bureau

Disclosure of Ownership

Notice required under Section 15.04(1)(m), Wisconsin Statutes. The statutory authority for the use of this form is prescribed in Sections 66.0903(12)(d) and 103.49(7)(d), Wisconsin Statutes. The use of this form is mandatory. The penalty for failing to complete this form is prescribed in Section 103.005(12), Wisconsin Statutes. Personal information you provide may be used for secondary purposes.

(1) On the date a contractor submits a bid to or completes negotiations with a state agency or local governmental unit, on a project subject to Section 66.0903 or 103.49, Wisconsin Statutes, the contractor shall disclose to such state agency or local governmental unit the name of any "other construction business", which the contractor, or a shareholder, officer or partner of the contractor, owns or has owned within the preceding three (3) years.

(2) The term "other construction business" means any business engaged in the erection, construction, remodeling, repairing, demolition, altering or painting and decorating of buildings, structures or facilities. It also means any business engaged in supplying mineral aggregate, or hauling excavated material or spoil as provided by Sections 66.0903(3), 103.49(2) and 103.50(2), Wisconsin Statutes.

(3) This form must ONLY be filed, with the state agency or local governmental unit that will be awarding the contract, if **both (A) and (B) are met**.

(A) The contractor, or a shareholder, officer or partner of the contractor:
(1) Owns at least a 25% interest in the "other construction business", indicated below, on the date the contractor submits a bid or completes negotiations.
(2) Or has owned at least a 25% interest in the "other construction business" at any time within the preceding three (3) years.

(B) The Wisconsin Department of Workforce Development (DWD) has determined that the "other construction business" has failed to pay the prevailing wage rate or time and one-half the required hourly basic rate of pay, for hours worked in excess of the prevailing hours of labor, to any employee at any time within the preceding three (3) years.

Other Construction Business

Not Applicable ☐

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

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

Print the Name of Authorized Officer	
Signature of Authorized Officer	Date Signed
Name of Corporation, Partnership or Sole Proprietorship	

Street Address or P O Box	City	State	Zip Code

If you have any questions call (608) 266-0028

ERD-7777-E (R. 09/2003)

BREESE STEVENS FIELD LIGHTING/SOUND SYSTEM IMPROVEMENTS
CONTRACT NO. 7044

Best Value Contracting

1. The Contractor shall indicate the non-apprenticeable trades used on this contract.

_____

_____

2. Madison General Ordinance (M.G.O.), 33.07(7), does provide for some exemptions from the active apprentice requirement. Apprenticeable trades are those trades considered apprenticeable by the State of Wisconsin. Please check applicable box if you are seeking an exemption.

☐ Contractor has a total skilled workforce of four or less individuals in all apprenticeable trades combined.

☐ No available trade training program; The Contractor has been rejected by the only available trade training program, or there is no trade training program within 90 miles.

☐ Contractor is not using an apprentice due to having a journey worker on layoff status, provided the journey worker was employed by the contractor in the past six months.

☐ First-time Contractor on City of Madison Public Works contract requests a onetime exemption but intends to comply on all future contracts and is taking steps typical of a "good faith" effort.

☐ Contractor has been in business less than one year.

☐ Contractor doesn't have enough journeyman trade workers to qualify for a trade training program in that respective trade

3. The Contractor shall indicate on the following section which apprenticeable trades are to be used on this contract. Compliance with active apprenticeship, to the extent required by M.G.O. 33.07(7), shall be satisfied by documentation from an applicable trade training body; an apprenticeship contract with the Wisconsin Department of Workforce Development or a similar agency in another state; or the U.S Department of Labor. This documentation is required prior to the Contractor beginning work on the project site.

☐ The Contractor has reviewed the list and shall not use any apprenticeable trades on this project.

LIST APPRENTICABLE TRADES (check all that apply to your work to be performed on this contract)

- ☐ BRICKLAYER
- ☐ CARPENTER
- ☐ CEMENT MASON / CONCRETE FINISHER
- ☐ CEMENT MASON (HEAVY HIGHWAY)
- ☐ CONSTRUCTION CRAFT LABORER
- ☐ DATA COMMUNICATION INSTALLER
- ☐ ELECTRICIAN
- ☐ ENVIRONMENTAL SYSTEMS TECHNICIAN / HVAC SERVICE TECH/HVAC INSTALL / SERVICE
- ☐ GLAZIER
- ☐ HEAVY EQUIPMENT OPERATOR / OPERATING ENGINEER
- ☐ INSULATION WORKER (HEAT & FROST)
- ☐ IRON WORKER
- ☐ IRON WORKER (ASSEMBLER, METAL BLDGS)
- ☐ PAINTER & DECORATOR
- ☐ PLASTERER
- ☐ PLUMBER
- ☐ RESIDENTIAL ELECTRICIAN
- ☐ ROOFER & WATER PROOFER
- ☐ SHEET METAL WORKER
- ☐ SPRINKLER FITTER
- ☐ STEAMFITTER
- ☐ STEAMFITTER (REFRIGERATION)
- ☐ STEAMFITTER (SERVICE)
- ☐ TAPER & FINISHER
- ☐ TELECOMMUNICATIONS (VOICE, DATA & VIDEO) INSTALLER-TECHNICIAN
- ☐ TILE SETTER

SECTION G: BID BOND

KNOW ALL MEN BY THESE PRESENT, THAT _____ (a corporation of the State of _____) (individual), (partnership), hereinafter referred to as the "Principal") and _____, a corporation of the State of _____ (hereinafter referred to as the "Surety") and licensed to do business in the State of Wisconsin, are held and firmly bound unto the City of Madison, (hereinafter referred to as the "Obligee"), in the sum of five per cent (5%) of the amount of the total bid or bids of the Principal herein accepted by the Obligee, for the payment of which the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

The conditions of this obligation are such that, whereas the Principal has submitted, to the City of Madison a certain bid, including the related alternate, and substitute bids attached hereto and hereby made a part hereof, to enter into a contract in writing for the construction of:

BREESE STEVENS FIELD LIGHTING/SOUND SYSTEM IMPROVEMENTS CONTRACT NO. 7044

1. If said bid is rejected by the Obligee, then this obligation shall be void.

2. If said bid is accepted by the Obligee and the Principal shall execute and deliver a contract in the form specified by the Obligee (properly completed in accordance with said bid) and shall furnish a bond for his/her faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be void.

   If said bid is accepted by the Obligee and the Principal shall fail to execute and deliver the contract and the performance and payment bond noted in 2. above executed by this Surety, or other Surety approved by the City of Madison, all within the time specified or any extension thereof, the Principal and Surety agree jointly and severally to forfeit to the Obligee as liquidated damages the sum mentioned above, it being understood that the liability of the Surety for any and all claims hereunder shall in no event exceed the sum of this obligation as stated, and it is further understood that the Principal and Surety reserve the right to recover from the Obligee that portion of the forfeited sum which exceed the actual liquidated damages incurred by the Obligee.

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

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

Seal

Principal	Date
By:	
Name of Surety	
By:	
	Date

This certifies that I have been duly licensed as an agent for the above company in Wisconsin under License No. _____ for the year _____, and appointed as attorney in fact with authority to execute this bid bond and the payment and performance bond referred to above, which power of attorney has not been revoked.

Date	Agent
	Address
	City, State and Zip Code
	Telephone Number

NOTE TO SURETY & PRINCIPAL

The bid submitted which this bond guarantees may be rejected if the following instrument is not attached to this bond:

Power of Attorney showing that the agent of Surety is currently authorized to execute bonds on behalf of the Surety, and in the amounts referenced above.

Certificate of Biennial Bid Bond

TIME PERIOD - VALID (FROM/TO)
NAME OF SURETY
NAME OF CONTRACTOR
CERTIFICATE HOLDER City of Madison, Wisconsin

This is to certify that a biennial bid bond issued by the above-named Surety is currently on file with the City of Madison.

This certificate is issued as a matter of information and conveys no rights upon the certificate holder and does not amend, extend or alter the coverage of the biennial bid bond.

Cancellation: Should the above policy be cancelled before the expiration date, the issuing Surety will give thirty (30) days written notice to the certificate holder indicated above.

Signature of Authorized Contractor Representative

Date

SECTION H: AGREEMENT

THIS AGREEMENT made this _____ day of _____ in the year Two Thousand and Thirteen between _____ hereinafter called the Contractor, and the City of Madison, Wisconsin, hereinafter called the City.

WHEREAS, the Common Council of the said City of Madison under the provisions of a resolution adopted _____, and by virtue of authority vested in the said Council, has awarded to the Contractor the work of performing certain construction.

NOW, THEREFORE, the Contractor and the City, for the consideration hereinafter named, agree as follows:

1. **Scope of Work.** The Contractor shall, perform the construction, execution and completion of the following listed complete work or improvement in full compliance with the Plans, Specifications, Standard Specifications, Supplemental Specifications, Special Provisions and contract; perform all items of work covered or stipulated in the proposal; perform all altered or extra work; and shall furnish, unless otherwise provided in the contract, all materials, implements, machinery, equipment, tools, supplies, transportation, and labor necessary to the prosecution and completion of the work or improvements:

BREESE STEVENS FIELD LIGHTING/SOUND SYSTEM IMPROVEMENTS CONTRACT NO. 7044

2. **Completion Date/Contract Time.** Construction work must begin within seven (7) calendar days after the date appearing on mailed written notice to do so shall have been sent to the Contractor and shall be carried on at a rate so as to secure full completion SEE SPECIAL PROVISIONS, the rate of progress and the time of completion being essential conditions of this Agreement.

3. **Contract Price.** The City shall pay to the Contractor at the times, in the manner and on the conditions set forth in said specifications, the sum of _____($_____) Dollars being the amount bid by such Contractor and which was awarded to him/her as provided by law.

4. **Wage Rates for Employees of Public Works Contractors**

   General and Authorization. The Contractor shall compensate its employees at the prevailing wage rate in accordance with section 66.0903, Wis. Stats., DWD 290 of the Wisconsin Administrative Code and as hereinafter provided.

   "Public Works" shall include building or work involving the erection, construction, remodeling, repairing or demolition of buildings, parking lots, highways, streets, bridges, sidewalks, street lighting, traffic signals, sanitary sewers, water mains and appurtenances, storm sewers, and the grading and landscaping of public lands.

   "Building or work" includes construction activity as distinguished from manufacturing, furnishing of materials, or servicing and maintenance work, except for the delivery of mineral aggregate such as sand, gravel, bituminous asphaltic concrete or stone which is incorporated into the work under contract with the City by depositing the material directly in final place from transporting vehicle.

   "Erection, construction, remodeling, repairing" means all types of work done on a particular building or work at the site thereof in the construction or development of the project, including without limitation, erecting, construction, remodeling, repairing, altering, painting, and decorating, the transporting of materials and supplies to or from the building or work done by the employees of the Contractor, Subcontractor, or Agent thereof, and the manufacturing or furnishing of materials, articles, supplies or equipment on the site of the building or work, by persons employed by the Contractor, Subcontractor, or Agent thereof.

"Employees working on the project" means laborers, workers, and mechanics employed directly upon the site of work.

"Laborers, Workers, and Mechanics" include pre-apprentices, helpers, trainees, learners and properly registered and indentured apprentices but exclude clerical, supervisory, and other personnel not performing manual labor.

Establishment of Wage Rates. The Department of Public Works shall periodically obtain a current schedule of prevailing wage rates from DWD. The schedule shall be used to establish the City of Madison Prevailing Wage Rate Schedule for Public Works Construction (prevailing wage rate). The Department of Public Works may include known increases to the prevailing wage rate which can be documented and are to occur on a future specific date. The prevailing wage rate shall be included in public works contracts subsequently negotiated or solicited by the City. Except for known increases contained within the schedule, the prevailing wage rate shall not change during the contract. The approved wage rate is attached hereto.

Workforce Profile. The Contractor shall, at the time of signature of the contract, notify the City Engineer in writing of the names and classifications of all the employees of the Contractor, Subcontractors, and Agents proposed for the work. In the alternative, the Contractor shall submit in writing the classifications of all the employees of the Contractor, Subcontractors and Agents and the total number of hours estimated in each classification for the work. This workforce profile(s) shall be reviewed by the City Engineer who may, within ten (10) days, object to the workforce profile(s) as not being reflective of that which would be required for the work. The Contractor may request that the workforce profile, or a portion of the workforce profile, be submitted after the signature of the contract but at least ten (10) days prior to the work commencing. Any costs or time loss resulting from modifications to the workforce profile as a result of the City Engineer's objections shall be the responsibility of the Contractor.

Payrolls and Records. The Contractor shall keep weekly payroll records setting forth the name, address, telephone number, classification, wage rate and fringe benefit package of all the employees who work on the contract, including the employees of the Contractor's subcontractors and agents. Such weekly payroll records must include the required information for all City contracts and all other contracts on which the employee worked during the week in which the employee worked on the contract. The Contractor shall also keep records of the individual time each employee worked on the project and for each day of the project. Such records shall also set forth the total number of hours of overtime credited to each such employee for each day and week and the amount of overtime pay received in that week. The records shall set forth the full weekly wages earned by each employee and the actual hourly wage paid to the employee.

The Contractor shall submit the weekly payroll records, including the records of the Contractor's subcontractors and agents, to the City Engineer for every week that work is being done on the contract. The submittal shall be within twenty-one (21) calendar days of the end of the Contractor's weekly pay period.

Employees shall receive the full amounts accrued at the time of the payment, computed at rates not less than those stated in the prevailing wage rate and each employee's rate shall be determined by the work that is done within the trade or occupation classification which should be properly assigned to the employee.

An employee's classification shall not be changed to a classification of a lesser rate during the contract. If, during the term of the contract, an employee works in a higher pay classification than the one which was previously properly assigned to the employee, then that employee shall be considered to be in the higher pay classification for the balance of the contract, receive the appropriate higher rate of pay, and she/he shall not receive a lesser rate during the balance of the contract. For purposes of clarification, it is noted that there is a distinct difference between working in a different classification with higher pay and doing work within a classification that has

varying rates of pay which are determined by the type of work that is done within the classification. For example, the classification “Operating Engineer” provides for different rates of pay for various classes of work and the Employer shall compensate an employee classified as an “Operating Engineer” based on the highest class of work that is done in one day. Therefore, an “Operating Engineer’s” rate may vary on a day to day basis depending on the type of work that is done, but it will never be less than the base rate of an “Operating Engineer”. Also, as a matter of clarification, it is recognized that an employee may work in a higher paying classification merely by chance and without prior intention, calculation or design. If such is the case and the performance of the work is truly incidental and the occurrence is infrequent, inconsequential and does not serve to undermine the single classification principle herein, then it may not be required that the employee be considered to be in the higher pay classification and receive the higher rate of pay for the duration of the contract. However, the Contractor is not precluded or prevented from paying the higher rate for the limited time that an employee performs work that is outside of the employee’s proper classification.

Questions regarding an employee’s classification, rate of pay or rate of pay within a classification, shall be resolved by reference to the established practice that predominates in the industry and on which the trade or occupation rate/classification is based. Rate of pay and classification disputes shall be resolved by relying upon practices established by collective bargaining agreements and guidelines used in such determination by appropriate recognized trade unions operating within the City of Madison.

The Contractor, its Subcontractors and Agents shall submit to interrogation regarding compliance with the provisions of this ordinance.

Mulcting of the employees by the Contractor, Subcontractor, and Agents on Public Works contracts, such as by kickbacks or other devices, is prohibited. The normal rate of wage of the employees of the Contractor, Subcontractor, and Agents shall not be reduced or otherwise diminished as a result of payment of the prevailing wage rate on a public works contract.

Hourly contributions. Hourly contributions shall be determined in accordance with the prevailing wage rate and with DWD. 290.01(10), Wis. Admin. Code.

Apprentices and Subjourney persons. Apprentices and sub journeypersons performing work on the project shall be compensated in accordance with the prevailing wage rate and with DWD 290.02, and 290.025, respectively, Wis. Admin. Code.

Straight Time Wages. The Contractor may pay straight time wages as determined by the prevailing wage rate and DWD 290.04, Wis. Admin. Code.

Overtime Wages. The Contractor shall pay overtime wages as required by the prevailing wage rate and DWD 290.05, Wis. Admin. Code.

Posting of Wage Rates and Hours. A clearly legible copy of the prevailing wage rate, together with the provisions of Sec. 66.0903(10)(a) and (11)(a), Wis. Stats., shall be kept posted in at least one conspicuous and easily accessible place at the project site by the Contractor and such notice shall remain posted during the full time any laborers, workers or mechanics are employed on the contract.

Evidence of Compliance by Contractor. Upon completion of the contract, the Contractor shall file with the Department of Public Works an affidavit stating:

a. That the Contractor has complied fully with the provisions and requirements of Sec. 66.0903(3), Wis. Stats., and Chapter DWD 290, Wis. Admin. Code; the Contractor has received evidence of compliance from each of the agents and subcontractors; and the names and addresses of all of the subcontractors and agents who worked on the contract.

b. That full and accurate records have been kept, which clearly indicate the name and trade or occupation of every laborer, worker or mechanic employed by the Contractor in connection with work on the project. The records shall show the number of hours worked by each employee and the actual wages paid therefore; where these records will be kept and the name, address and telephone number of the person who will be responsible for keeping them. The records shall be retained and made available for a period of at least three (3) years following the completion of the project of public works and shall not be removed without prior notification to the municipality.

Evidence of Compliance by Agent and Subcontractor. Each agent and subcontractor shall file with the Contractor, upon completion of their portion of the work on the contract an affidavit stating that all the provisions of Sec. 66.0903(3), Wis. Stats., have been fully complied with and that full and accurate records have been kept, which clearly indicate the name and trade or occupation of every laborer, worker or mechanic employed by the Contractor in connection with work on the project. The records shall show the number of hours worked by each employee and the actual wages paid therefore; where these records shall be kept and the name, address and telephone number of the person who shall be responsible for keeping them. The records shall be retained and made available for a period of at least three (3) years following the completion of the project of public works and shall not be removed without prior notification to the municipality.

Failure to Comply with the Prevailing Wage Rate. If the Contractor fails to comply with the prevailing wage rate, she/he shall be in default on the contract.

5. **Affirmative Action.** In the performance of the services under this Agreement the Contractor agrees not to discriminate against any employee or applicant because of race, religion, marital status, age, color, sex, disability, national origin or ancestry, income level or source of income, arrest record or conviction record, less than honorable discharge, physical appearance, sexual orientation, political beliefs, or student status. The Contractor further agrees not to discriminate against any subcontractor or person who offers to subcontract on this contract because of race, religion, color, age, disability, sex or national origin.

The Contractor agrees that within thirty (30) days after the effective date of this agreement, the Contractor will provide to the City Affirmative Action Division certain workforce utilization statistics, using a form to be furnished by the City.

If the contract is still in effect, or if the City enters into a new agreement with the Contractor, within one year after the date on which the form was required to be provided, the Contractor will provide updated workforce information using a second form, also to be furnished by the City. The second form will be submitted to the City Affirmative Action Division no later than one year after the date on which the first form was required to be provided.

The Contractor further agrees that, for at least twelve (12) months after the effective date of this contract, it will notify the City Affirmative Action Division of each of its job openings at facilities in Dane County for which applicants not already employees of the Contractor are to be considered. The notice will include a job description, classification, qualifications and application procedures and deadlines. The Contractor agrees to interview and consider candidates referred by the Affirmative Action Division if the candidate meets the minimum qualification standards established by the Contractor, and if the referral is timely. A referral is timely if it is received by the Contractor on or before the date started in the notice.

Articles of Agreement
Article I

The Contractor shall take affirmative action in accordance with the provisions of this contract to insure that applicants are employed, and that employees are treated during employment without regard to race, religion, color, age, marital status, disability, sex or national original and that the

employer shall provide harassment free work environment for the realization of the potential of each employee. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation and selection for training including apprenticeship insofar as it is within the control of the Contractor. The Contractor agrees to post in conspicuous places available to employees and applicants notices to be provided by the City setting out the provisions of the nondiscrimination clauses in this contract.

Article II

The Contractor shall in all solicitations or advertisements for employees placed by or on behalf of the Contractors state that all qualified or qualifiable applicants will be employed without regard to race, religion, color, age, marital status, disability, sex or national origin.

Article III

The Contractor shall send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding a notice to be provided by the City advising the labor union or worker's representative of the Contractor's equal employment opportunity and affirmative action commitments. Such notices shall be posted in conspicuous places available to employees and applicants for employment.

Article V

The Contractor agrees that it will comply with all provisions of the Affirmative Action Ordinance of the City of Madison, including the contract compliance requirements. The Contractor agrees to submit the model affirmative action plan for public works contractors in a form approved by the Director of Affirmative Action.

Article VI

The Contractor will maintain records as required by Section 39.02(9)(f) of the Madison General Ordinances and will provide the City Affirmative Action Division with access to such records and to persons who have relevant and necessary information, as provided in Section 39.02(9)(f). The City agrees to keep all such records confidential, except to the extent that public inspection is required by law.

Article VII

In the event of the Contractor's or subcontractor's failure to comply with the Equal Employment Opportunity and Affirmative Action Provisions of this contract or Section 39.03 and 39.02 of the Madison General Ordinances, it is agreed that the City at its option may do any or all of the following:

1. Cancel, terminate or suspend this Contract in whole or in part.

2. Declare the Contractor ineligible for further City contracts until the Affirmative Action requirements are met.

3. Recover on behalf of the City from the prime Contractor 0.5 percent of the contract award price for each week that such party fails or refuses to comply, in the nature of liquidated damages, but not to exceed a total of five percent (5%) of the contract price, or five thousand dollars ($5,000), whichever is less. Under public works contracts, if a subcontractor is in noncompliance, the City may recover liquidated damages from the prime Contractor in the manner described above. The preceding sentence shall not be construed to prohibit a prime Contractor from recovering the amount of such damage from the non-complying subcontractor.

Article VIII

The Contractor shall include the above provisions of this contract in every subcontract so that such provisions will be binding upon each subcontractor. The Contractor shall take such action with respect to any subcontractor as necessary to enforce such provisions, including sanctions provided for noncompliance.

Article IX

The Contractor shall allow the maximum feasible opportunity to small business enterprises to compete for any subcontracts entered into pursuant to this contract.

BREESE STEVENS FIELD LIGHTING/SOUND SYSTEM IMPROVEMENTS
CONTRACT NO. 7044

IN WITNESS WHEREOF, the Contractor has hereunto set his/her hand and seal and the City has caused these presents to be sealed with its corporate seal and to be subscribed by its Mayor and City Clerk the day and year first above written.

Countersigned:

Company Name

Witness Date

President Date

Witness Date

Secretary Date

CITY OF MADISON, WISCONSIN

Provisions have been made to pay the liability that will accrue under this contract.

Approved as to form:

Finance Director

City Attorney

Signed this _____ day of _____, 20_____

Witness

Mayor Date

Witness

City Clerk Date

PREVAILING WAGE RATE DETERMINATION
Issued by the State of Wisconsin
Department of Workforce Development
Pursuant to s. 66.0903, Wis. Stats.
Issued On: 01/10/2013
Amended On: 02/18/2013

DETERMINATION NUMBER: 201300080

EXPIRATION DATE: Prime Contracts MUST Be Awarded or Negotiated On Or Before 12/31/2013. If NOT, You MUST Reapply.

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

PROJECT LOCATION: MADISON CITY, DANE COUNTY, WI

CONTRACTING AGENCY: CITY OF MADISON-ENGINEERING

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:	Time and one-half must be paid for all hours worked: - 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. 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. A DOT Premium (discussed below) may supersede this time and one-half requirement.
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, whevenever 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 journeyperson'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

Fringe Benefits Must Be Paid On All Hours Worked

CODE	TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
101	Acoustic Ceiling Tile Installer	30.16	15.31	45.47
102	Boilermaker	31.09	24.52	55.61
103	Bricklayer, Blocklayer or Stonemason Future Increase(s): Add $ .80 on 6/1/2013 Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	32.01	17.35	49.36
104	Cabinet Installer	30.16	15.31	45.47
105	Carpenter	30.16	15.31	45.47
106	Carpet Layer or Soft Floor Coverer	30.16	15.31	45.47
107	Cement Finisher	31.48	13.19	44.67
108	Drywall Taper or Finisher	25.10	14.78	39.88
109	Electrician Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	32.94	18.80	51.74
110	Elevator Constructor	44.94	23.84	68.78
111	Fence Erector	22.50	3.98	26.48
112	Fire Sprinkler Fitter	36.07	18.60	54.67
113	Glazier	37.13	12.32	49.45
114	Heat or Frost Insulator	33.93	23.26	57.19
115	Insulator (Batt or Blown)	27.47	19.16	46.63
116	Ironworker	30.90	19.11	50.01
117	Lather	30.16	15.31	45.47
118	Line Constructor (Electrical)	37.05	16.94	53.99

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
119	Marble Finisher	20.00	0.00	20.00
120	Marble Mason	32.01	16.85	48.86
121	Metal Building Erector	18.05	8.08	26.13
122	Millwright	31.76	15.36	47.12
123	Overhead Door Installer	13.50	0.00	13.50
124	Painter	24.80	14.78	39.58
125	Pavement Marking Operator	30.00	0.00	30.00
126	Piledriver	30.66	15.31	45.97
127	Pipeline Fuser or Welder (Gas or Utility)	30.18	19.29	49.47
129	Plasterer	30.03	16.36	46.39
130	Plumber	36.17	15.37	51.54
132	Refrigeration Mechanic	42.45	16.71	59.16
133	Roofer or Waterproofer	30.40	2.23	32.63
134	Sheet Metal Worker	34.23	20.19	54.42
135	Steamfitter	41.20	16.28	57.48
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.	21.89	11.85	33.74
138	Temperature Control Installer	41.20	16.21	57.41
139	Terrazzo Finisher Future Increase(s): Add $ .80 on 6/1/2013	26.57	16.50	43.07
140	Terrazzo Mechanic	29.51	17.63	47.14
141	Tile Finisher Future Increase(s): Add $ .80/hr on 6/1/2013.	23.77	16.50	40.27
142	Tile Setter Future Increase(s): Add $ .80/hr on 6/1/2013.	29.71	16.50	46.21
143	Tuckpointer, Caulker or Cleaner Future Increase(s): Add $ .80 on 6/1/2013 Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	32.01	17.35	49.36

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
144	Underwater Diver (Except on Great Lakes)	34.16	15.31	49.47
146	Well Driller or Pump Installer Future Increase(s): Add $.20/hr on 06/01/2013.	25.32	15.45	40.77
147	Siding Installer	37.20	17.01	54.21
150	Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	28.24	15.10	43.34
151	Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY	29.64	14.64	44.28
152	Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	25.94	13.57	39.51
153	Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	24.08	12.96	37.04
154	Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	24.00	11.57	35.57

TRUCK DRIVERS

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
201	Single Axle or Two Axle	31.89	17.98	49.87
203	Three or More Axle	18.00	11.45	29.45
204	Articulated, Euclid, Dumptor, Off Road Material Hauler Future Increase(s): Add $1/hr on 6/2/2013.	32.39	18.46	50.85
205	Pavement Marking Vehicle	20.85	11.02	31.87
207	Truck Mechanic	18.00	11.45	29.45

LABORERS

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
301	General Laborer Future Increase(s): Add $.75/hr. on 06/03/2013 Premium Increase(s): Add $1.00/hr for certified welder; Add $.25/hr for mason tender	24.19	13.90	38.09
302	Asbestos Abatement Worker	18.00	0.00	18.00
303	Landscaper	15.00	3.90	18.90
310	Gas or Utility Pipeline Laborer (Other Than Sewer and Water)	20.94	12.65	33.59

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
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.	18.31	12.67	30.98
314	Railroad Track Laborer	23.41	6.91	30.32
315	Final Construction Clean-Up Worker	24.69	12.90	37.59

HEAVY EQUIPMENT OPERATORS
SITE PREPARATION, UTILITY OR LANDSCAPING WORK ONLY

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
501	Air Track, Rotary or Percussion Drilling Machine &/or Hammers, Blaster; Asphalt Milling Machine; Boring Machine (Directional, Horizontal or Vertical); Backhoe (Track Type) Having a Mfgr's Rated Capacity of 130,000 Lbs. or Over; Backhoe (Track Type) Having a Mfgr's Rated Capacity of Under 130,000 Lbs., Backhoe (Mini, 15,000 Lbs. & Under); Bulldozer or Endloader (Over 40 hp); Compactor (Self-Propelled 85 Ft Total Drum Width & Over, or Tractor Mounted, Towed & Light Equipment); Concrete Batch Plant, Batch Hopper; Concrete Breaker (Large, Auto, Vibratory/Sonic, Manual or Remote); Crane, Shovel, Dragline, Clamshells; Forklift (Machinery Moving or Steel Erection, 25 Ft & Over); Gradall (Cruz-Aire Type); Grader or Motor Patrol; Master Mechanic; Mechanic or Welder; Robotic Tool Carrier (With or Without Attachments); Scraper (Self Propelled or Tractor Drawn) 5 cu yds or More Capacity; Tractor or Truck Mounted Hydraulic Backhoe; Tractor or Truck Mounted Hydraulic Crane (10 Tons or Under); Tractor (Scraper, Dozer, Pusher, Loader); Trencher (Wheel Type or Chain Type Having Over 8 Inch Bucket). Future Increase(s): Add $1/hr on 6/2/2013.	32.39	18.46	50.85
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). Future Increase(s): Add $1/hr on 6/2/2013.	32.39	18.46	50.85
503	Air Compressor (&/or 400 CFM or Over); Augers (Vertical & Horizontal); Compactor (Self-Propelled 84 Ft Total Drum Width & Under, or Tractor Mounted, Towed & Light Equipment); Crusher, Screening or Wash Plant; Farm or Industrial Type Tractor; Forklift; Generator (&/or 150 KW or Over); Greaser; High Pressure Utility Locating Machine (Daylighting Machine); Mulcher; Oiler; Post Hole Digger or Driver; Pump (3 Inch or Over) or Well Points; Refrigeration Plant or Freeze Machine; Rock, Stone Breaker; Skid Steer Loader (With or Without Attachments); Vibratory Hammer or Extractor, Power Pack. Future Increase(s): Add $1/hr on 6/2/2013.	30.32	18.46	48.78

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
504	Work Performed on the Great Lakes Including Diver; Wet Tender or Hydraulic Dredge Engineer.	37.45	19.45	56.90
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. Future Increase(s): Add $2.19/hr on 01/01/2013; Add $2.00/hr on 01/01/2014. Premium Increase(s): Add $.50/hr for Friction Crane, Lattice Boom or Crane Certification (CCO).	38.80	20.17	58.97
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. Future Increase(s): Add $2.08/hr on 01/01/2013; Add $2.00/hr on 01/01/2014.	34.50	20.04	54.54
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. Future Increase(s): Add $1.88/hr on 01/01/2013; Add $2.00/hr on 01/01/2014.	28.70	19.86	48.56

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

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
508	Boring Machine (Directional); Crane, Tower Crane, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons, Self-Erecting Tower Crane With a Lifting Capacity of Over 4,000 Lbs., Crane With Boom Dollies; Crane, Tower Crane, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 176 Ft or Over; Master Mechanic. Future Increase(s): Add $1/hr on 6/2/2013. Premium Increase(s): Add $.50/hr for >200 Ton / Add $1/hr at 300 Ton / Add $1.50 at 400 Ton / Add $2/hr at 500 Ton & Over.	35.12	18.46	53.58

CODE	Fringe Benefits Must Be Paid On All Hours Worked 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). Future Increase(s): Add $1/hr on 6/2/2013. Premium Increase(s): Add $.25/hr for all >45 Ton lifting capacity cranes.	34.12	18.46	52.58
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).	32.42	17.97	50.39
511	Air, Track, Rotary or Percussion Drilling Machine &/or Hammers, Blaster; Bulldozer or Endloader (Over 40 hp); Compactor (Self-Propelled 85 Ft Total Drum Width & Over, or Tractor Mounted, Towed & Light Equipment); Concrete Pump (46 Meter & Under), Concrete Conveyor (Rotec or Bidwell Type); Crane (Carry Deck, Mini) or Truck Mounted Hydraulic Crane (10 Tons or Under); Environmental Burner; Gantrys (Under 20,000 Lbs.); Grader or Motor Patrol; High Pressure Utility Locating Machine (Daylighting Machine); Manhoist; Material or Stack Hoist; Mechanic or Welder; Railroad Track Rail Leveling Machine, Tie Placer, Extractor, Tamper, Stone Leveler or Rehabilitation Equipment; Roller (Over 5 Ton); Scraper (Self Propelled or Tractor Drawn) 5 cu yd or More Capacity; Screed (Milling Machine); Sideboom; Straddle Carrier or Travel Lift; Tining or Curing Machine; Tractor (Scraper, Dozer, Pusher, Loader); Tractor or Truck Mounted Hydraulic Backhoe; Tractor or Truck Mounted Hydraulic Crane (10 Tons or Under); Trencher (Wheel Type or Chain Type Having Over 8-Inch Bucket). Future Increase(s): Add $1/hr on 6/2/2013.	32.39	18.46	50.85
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; 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. Future Increase(s): Add $1/hr on 6/2/2013.	30.32	18.46	48.78

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
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; Robotic Tool Carrier (With or Without Attachments); Rock, Stone Breaker; Skid Steer Loader (With or Without Attachments); Vibratory Hammer or Extractor, Power Pack. Future Increase(s): Add $1/hr on 6/2/2013.	29.69	18.46	48.15
514	Gas or Utility Pipeline, Except Sewer & Water (Primary Equipment). Future Increase(s): Add $2/hr on 1/1/2013.	34.89	20.59	55.48
515	Gas or Utility Pipeline, Except Sewer & Water (Secondary Equipment). Future Increase(s): Add $1.60/hr on 06/01/2013; Add $1.60/hr on 06/01/2014; Add $1.65/hr on 06/01/2015.	31.32	17.95	49.27
516	Fiber Optic Cable Equipment Future Increase(s): Add $1.75/hr on 02/01/2013; Add $1.75/hr on 02/01/2014	26.69	16.65	43.34

SEWER, WATER OR TUNNEL CONSTRUCTION

Includes those projects that primarily involve public sewer or water distribution, transmission or collection systems and related tunnel work (excluding buildings).

SKILLED TRADES

Fringe Benefits Must Be Paid On All Hours Worked

CODE	TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
103	Bricklayer, Blocklayer or Stonemason Future Increase(s): 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.	35.80	16.87	52.67
105	Carpenter Future Increase(s): Add $.75/hr on 6/3/2013. Add $1.25/hr on 6/2/2014. Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	32.93	19.81	52.74
107	Cement Finisher Future Increase(s): 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.	32.09	16.13	48.22
109	Electrician Future Increase(s): 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.	32.20	21.71	53.91
111	Fence Erector	22.50	3.98	26.48
116	Ironworker	30.90	19.11	50.01
118	Line Constructor (Electrical)	37.05	16.94	53.99
125	Pavement Marking Operator	28.10	15.00	43.10
126	Piledriver	30.66	15.31	45.97
130	Plumber	36.97	17.66	54.63

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
135	Steamfitter	41.20	16.28	57.48
137	Teledata Technician or Installer	21.26	11.75	33.01
143	Tuckpointer, Caulker or Cleaner	32.01	16.85	48.86
144	Underwater Diver (Except on Great Lakes)	37.45	19.45	56.90
146	Well Driller or Pump Installer	21.00	2.23	23.23
150	Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	28.24	15.10	43.34
151	Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY	29.64	14.64	44.28
152	Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	25.94	13.57	39.51
153	Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	24.08	12.96	37.04
154	Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	21.75	11.90	33.65

TRUCK DRIVERS

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
201	Single Axle or Two Axle	25.87	13.00	38.87
203	Three or More Axle	17.54	13.85	31.39
204	Articulated, Euclid, Dumptor, Off Road Material Hauler	31.89	17.98	49.87
205	Pavement Marking Vehicle	20.85	11.02	31.87
207	Truck Mechanic	17.00	0.00	17.00

LABORERS

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
301	General Laborer Future Increase(s): Add $.80/hr. on 06/03/2013 Premium Increase(s): Add $.20 for blaster, bracer, manhole builder, caulker, bottomman and power tool; Add $.55 for pipelayer; Add $1.00 for tunnel work 0-15 lbs. compressed air; Add $2.00 for over 15-30 lbs. compressed air; Add $3.00 for over 30 lbs. compressed air.	25.53	13.89	39.42
303	Landscaper	26.92	12.51	39.43

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
304	Flagperson or Traffic Control Person	17.33	15.53	32.86
311	Fiber Optic Laborer (Outside, Other Than Concrete Encased)	17.81	12.22	30.03
314	Railroad Track Laborer	23.41	6.91	30.32

HEAVY EQUIPMENT OPERATORS
SEWER, WATER OR TUNNEL WORK

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
521	Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of 130,000 Lbs. or Over; Caisson Rig; Crane, Tower Crane, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 176 Ft or Over; Crane, Tower Crane, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons, Self-Erecting Tower Crane With a Lifting Capacity Of Over 4,000 Lbs., Crane With Boom Dollies; Master Mechanic; Pile Driver. Future Increase(s): Add $1/hr on 6/2/2013. Premium Increase(s): Add $.50/hr for >200 Ton / Add $1/hr at 300 Ton / Add $1.50 at 400 Ton / Add $2/hr at 500 Ton & Over.	35.12	18.46	53.58
522	Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of Under 130,000 Lbs., Backhoe (Mini, 15,000 Lbs. & Under); Boring Machine (Directional); Concrete Bump Cutter, Grinder, Planing or Grooving Machine; Concrete Laser/Screed; Concrete Paver (Slipform); Concrete Pump (Over 46 Meter), Concrete Conveyor (Rotec or Bidwell Type); Concrete Spreader & Distributor; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 175 Ft or Under; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under, Self-Erecting Tower Crane With a Lifting Capacity of 4,000 Lbs. & Under; Dredge (NOT Performing Work on the Great Lakes); Milling Machine; Skid Rig; Telehandler; Traveling Crane (Bridge Type). Future Increase(s): Add $1/hr on 6/2/2013.	32.92	18.46	51.38
523	Air Track, Rotary or Percussion Drilling Machine &/or Hammers, Blaster; Boring Machine (Horizontal or Vertical); Bulldozer or Endloader (Over 40 hp); Crane (Carry Deck, Mini) or Truck Mounted Hydraulic Crane (10 Tons or Under); Concrete Pump (46 Meter & Under), Concrete Conveyor (Rotec or Bidwell Type); Concrete Slipform Placer Curb & Gutter Machine; Gradall (Cruz-Aire Type); Grader or Motor Patrol; Hydro-Blaster (10,000 PSI or Over); Manhoist; Material or Stack Hoist; Mechanic or Welder; Roller (Over 5 Ton); Scraper (Self Propelled or Tractor Drawn) 5 cu yd or More Capacity; Screed (Milling Machine); Sideboom; Straddle Carrier or Travel Lift; Tractor (Scraper, Dozer, Pusher, Loader); Tractor or Truck Mounted Hydraulic Backhoe; Tractor or Truck Mounted Hydraulic Crane (10 Tons or Under); Trencher (Wheel Type or Chain Type Having Over 8-Inch Bucket). Future Increase(s): Add $1/hr on 6/2/2013.	32.39	18.46	50.85

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
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.	31.89	18.11	50.00
525	Air Compressor (&/or 400 CFM or Over); Air, Electric or Hydraulic Jacking System; Augers (Vertical & Horizontal); Compactor (Self-Propelled 84 Ft Total Drum Width & Under, or Tractor Mounted, Towed & Light Equipment); Crusher, Screening or Wash Plant; Farm or Industrial Type Tractor; Fireman (Asphalt Plant NOT Performing Work on the Great Lakes); Generator (&/or 150 KW or Over); Heaters (Mechanical); High Pressure Utility Locating Machine (Daylighting Machine); Loading Machine (Conveyor); Post Hole Digger or Driver; Refrigeration Plant or Freeze Machine; Rock, Stone Breaker; Skid Steer Loader (With or Without Attachments); Vibratory Hammer or Extractor, Power Pack. Future Increase(s): Add $1/hr on 6/2/2013.	29.69	18.46	48.15
526	Boiler (Temporary Heat); Forklift; Greaser; Oiler.	30.44	19.10	49.54
527	Work Performed on the Great Lakes Including Diver; Wet Tender or Hydraulic Dredge Engineer.	37.45	19.45	56.90
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.	37.45	19.45	56.90
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.	27.75	19.15	46.90
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.	27.75	19.15	46.90

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

Fringe Benefits Must Be Paid On All Hours Worked

CODE	TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
103	Bricklayer, Blocklayer or Stonemason	35.58	19.20	54.78
105	Carpenter	30.16	15.31	45.47
107	Cement Finisher Future Increase(s): 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.	32.09	16.13	48.22
109	Electrician Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year’s Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	32.94	18.80	51.74
111	Fence Erector	28.00	4.50	32.50
116	Ironworker	30.90	19.11	50.01
118	Line Constructor (Electrical)	31.29	15.34	46.63
124	Painter	26.65	13.10	39.75
125	Pavement Marking Operator	29.22	16.71	45.93
126	Piledriver	30.66	15.31	45.97
133	Roofer or Waterproofer	30.40	2.23	32.63
137	Teledata Technician or Installer	21.26	11.75	33.01
143	Tuckpointer, Caulker or Cleaner	32.01	16.85	48.86
144	Underwater Diver (Except on Great Lakes)	37.45	19.45	56.90
150	Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	29.64	17.00	46.64
151	Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY	35.50	15.09	50.59

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
152	Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	25.94	13.57	39.51
153	Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	24.08	12.96	37.04
154	Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	21.75	11.90	33.65

TRUCK DRIVERS

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
201	Single Axle or Two Axle	33.22	18.90	52.12
203	Three or More Axle Future Increase(s): 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.	23.31	17.13	40.44
204	Articulated, Euclid, Dumptor, Off Road Material Hauler Future Increase(s): 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 night work premium. See DOT's website for details about the applicability of this night work premium at: http://roadwaystandards.dot.wi.gov/hcci/labor-wages-eeo/index.shtm.	27.77	19.90	47.67
205	Pavement Marking Vehicle	23.84	14.94	38.78
206	Shadow or Pilot Vehicle	33.22	18.90	52.12
207	Truck Mechanic	22.50	16.19	38.69

LABORERS

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
301	General Laborer Future Increase(s): Add $1.70/hr on 6/1/2013; Add $1.60/hr on 6/1/2014. Premium Increase(s): Add $.10/hr for topman, air tool operator, vibrator or tamper operator (mechanical hand operated), chain saw operator and demolition burning torch laborer; Add $.15/hr for bituminous worker (raker and luteman), formsetter (curb, sidewalk and pavement) and strike off man; Add $.20/hr for blaster and powderman; Add $.25/hr for bottomman; Add $.35/hr for line and grade specialist; Add $.45/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).	28.35	13.90	42.25
302	Asbestos Abatement Worker	18.00	0.00	18.00
303	Landscaper Future Increase(s): Add $1.70/hr on 6/1/13; Add $1.60/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).	28.35	13.90	42.25
304	Flagperson or Traffic Control Person Future Increase(s): 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.	24.70	13.90	38.60
311	Fiber Optic Laborer (Outside, Other Than Concrete Encased)	17.81	12.22	30.03
314	Railroad Track Laborer	23.41	6.91	30.32

HEAVY EQUIPMENT OPERATORS
AIRPORT PAVEMENT OR STATE HIGHWAY CONSTRUCTION

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
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 6/1/13; 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 night work premium. See DOT's website for details about the applicability of this night work premium at: http://roadwaystandards.dot.wi.gov/hcci/labor-wages-eeo/index.shtm.	35.22	19.90	55.12
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 6/1/13; 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 night work premium. See DOT's website for details about the applicability of this night work premium at: http://roadwaystandards.dot.wi.gov/hcci/labor-wages-eeo/index.shtm.	34.72	19.90	54.62

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
533	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 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); 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. Future Increase(s): 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 night work premium. See DOT's website for details about the applicability of this night work premium at: http://roadwaystandards.dot.wi.gov/hcci/labor-wages-eeo/index.shtm.	34.22	19.90	54.12
534	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 Sawer (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. Future Increase(s): Add $2/hr on 6/1/13; Add $1.75/hr on 6/1/14. Premium Increase(s):	33.96	19.90	53.86

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
	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 night work premium. See DOT's website for details about the applicability of this night work premium at: http://roadwaystandards.dot.wi.gov/hcci/labor-wages-eeo/index.shtm.			
535	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. Future Increase(s): 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 night work premium. See DOT's website for details about the applicability of this night work premium at: http://roadwaystandards.dot.wi.gov/hcci/labor-wages-eeo/index.shtm.	33.67	19.90	53.57
536	Fiber Optic Cable Equipment.	25.74	15.85	41.59
537	Work Performed on the Great Lakes Including Diver; Wet Tender or Hydraulic Dredge Engineer.	37.45	19.45	56.90
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.	37.45	19.45	56.90
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.	27.75	19.15	46.90
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.	27.75	19.15	46.90

LOCAL STREET OR MISCELLANEOUS PAVING CONSTRUCTION

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	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
103	Bricklayer, Blocklayer or Stonemason	33.00	15.00	48.00
105	Carpenter	30.16	15.31	45.47
107	Cement Finisher	31.48	15.68	47.16
109	Electrician Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	32.94	18.80	51.74
111	Fence Erector	22.50	3.98	26.48
116	Ironworker	30.90	19.11	50.01
118	Line Constructor (Electrical)	37.05	16.94	53.99
124	Painter	24.80	14.78	39.58
125	Pavement Marking Operator	28.10	15.00	43.10
126	Piledriver	30.66	15.31	45.97
133	Roofer or Waterproofer	30.40	2.23	32.63
137	Teledata Technician or Installer	21.26	11.75	33.01
143	Tuckpointer, Caulker or Cleaner	32.01	16.85	48.86
144	Underwater Diver (Except on Great Lakes)	37.45	19.45	56.90
150	Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	29.64	14.55	44.19
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.	30.60	14.64	45.24
152	Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	25.94	13.57	39.51
153	Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	24.08	12.96	37.04
154	Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	21.75	11.90	33.65

TRUCK DRIVERS

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
201	Single Axle or Two Axle	25.87	13.00	38.87
203	Three or More Axle	17.00	0.00	17.00
204	Articulated, Euclid, Dumptor, Off Road Material Hauler Future Increase(s): Add $1/hr on 6/2/2013.	32.39	18.46	50.85
205	Pavement Marking Vehicle	20.85	11.02	31.87
206	Shadow or Pilot Vehicle	25.87	13.00	38.87
207	Truck Mechanic	17.00	0.00	17.00

LABORERS

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
301	General Laborer	27.20	13.37	40.57
303	Landscaper	18.25	1.11	19.36
304	Flagperson or Traffic Control Person	17.33	15.53	32.86
311	Fiber Optic Laborer (Outside, Other Than Concrete Encased)	17.81	12.22	30.03
314	Railroad Track Laborer	23.41	6.91	30.32

HEAVY EQUIPMENT OPERATORS
CONCRETE PAVEMENT OR BRIDGE WORK

Fringe Benefits Must Be Paid On All Hours Worked

CODE	TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
541	Crane, Tower Crane, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons, Self-Erecting Tower Crane With a Lifting Capacity Of Over 4,000 Lbs., Crane With Boom Dollies; Crane, Tower Crane, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 176 Ft or Over; Master Mechanic. Future Increase(s): Add $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 night work premium. See DOT's website for details about the applicability of this night work premium at: http://roadwaystandards.dot.wi.gov/hcci/labor-wages-eeo/index.shtm.	35.22	19.90	55.12
542	Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of 130,000 Lbs. or Over; Caisson Rig; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under, Self-Erecting Tower Crane With a Lifting Capacity of 4,000 Lbs. & Under; Crane, Tower Crane Portable Tower, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 175 Ft or Under; Dredge (NOT Performing Work on the Great Lakes); Licensed Boat Pilot (NOT Performing Work on the Great Lakes); Pile Driver. Future Increase(s): Add $2/hr on 6/1/13; 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 night work premium. See DOT's website for details about the applicability of this night work premium at: http://roadwaystandards.dot.wi.gov/hcci/labor-wages-eeo/index.shtm.	34.72	19.90	54.62

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
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. Future Increase(s): 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 night work premium. See DOT's website for details about the applicability of this night work premium at: http://roadwaystandards.dot.wi.gov/hcci/labor-wages-eeo/index.shtm.	34.22	19.90	54.12
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 Sawer (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 6/1/13; 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 night work premium. See DOT's website for details about the applicability of this night work premium at: http://roadwaystandards.dot.wi.gov/hcci/labor-wages-eeo/index.shtm.	33.96	19.90	53.86

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
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.	29.82	17.98	47.80
546	Fiber Optic Cable Equipment.	25.74	15.85	41.59
547	Work Performed on the Great Lakes Including Diver; Wet Tender or Hydraulic Dredge Engineer.	37.45	19.45	56.90
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.	37.45	19.45	56.90
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.	27.75	19.15	46.90
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.	27.75	19.15	46.90

HEAVY EQUIPMENT OPERATORS
ASPHALT PAVEMENT OR OTHER WORK

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
551	Crane, Tower Crane, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons, Self Erecting Tower Crane With a Lifting Capacity of Over 4,000 Lbs., Crane With Boom Dollies; Crane, Tower Crane, Pedestal Tower or Derrick, With Boom, Leads and/or Jib Lengths Measuring 176 Ft or Over; Master Mechanic.	34.62	17.98	52.60
552	Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of 130,000 Lbs. or Over; Caisson Rig; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under, Self-Erecting Tower Crane With a Lifting Capacity Of 4,000 Lbs. & Under; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 175 Ft or Under; Dredge (NOT Performing Work on the Great Lakes); Licensed Boat Pilot (NOT Performing Work on the Great Lakes); Pile Driver. Future Increase(s): Add $1/hr on 6/2/2013.	32.92	18.46	51.38

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
553	Air, Track, Rotary or Percussion Drilling Machine &/or Hammers, Blaster; Asphalt Heater, Planer & Scarifier; Asphalt Milling Machine; Asphalt Screed; Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of Under 130,000 Lbs., Backhoe (Mini, 15,000 Lbs. & Under); Bituminous (Asphalt) Plant & Paver, Screed; Boring Machine (Directional, Horizontal or Vertical); Bulldozer or Endloader; Concrete Breaker (Large, Auto, Vibratory/Sonic, Manual or Remote); Concrete Conveyor System; Concrete Laser/Screed; Concrete Slipform Placer Curb & Gutter Machine; Crane (Carry Deck, Mini) or Truck Mounted Hydraulic Crane (10 Tons or Under); Crane With a Lifting Capacity of 25 Tons or Under; Forestry Equipment, Timbco, Tree Shear, Tub Grinder, Processor; Gradall (Cruz-Aire Type); Grader or Motor Patrol; Hydro-Blaster (10,000 PSI or Over); Loading Machine (Conveyor); Manhoist; Material or Stack Hoist; Mechanic or Welder; Milling Machine; Post Hole Digger or Driver; Railroad Track Rail Leveling Machine, Tie Placer, Extractor, Tamper, Stone Leveler or Rehabilitation Equipment; Roller (Over 5 Ton); Scraper (Self Propelled or Tractor Drawn) 5 cu yds or More Capacity; Shoulder Widener; Sideboom; Skid Rig; Stabilizing or Concrete Mixer (Self-Propelled or 14S or Over); Tractor (Scraper, Dozer, Pusher, Loader); Tractor or Truck Mounted Hydraulic Backhoe; Trencher (Wheel Type or Chain Type); Tube Finisher; Tugger (NOT Performing Work on the Great Lakes); Winches & A-Frames. Future Increase(s): Add $1/hr on 6/2/2013.	32.39	18.46	50.85
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 Sawer (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 6/1/13; Add $1.75/hr on 6/1/14.	33.67	19.55	53.22
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 6/1/13; Add $1.75/hr on 6/1/14.	33.67	19.55	53.22
556	Fiber Optic Cable Equipment.	25.74	15.85	41.59

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

Fringe Benefits Must Be Paid On All Hours Worked

CODE	TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
101	Acoustic Ceiling Tile Installer	19.50	11.10	30.60
102	Boilermaker	31.09	24.52	55.61
103	Bricklayer, Blocklayer or Stonemason	23.00	0.00	23.00
104	Cabinet Installer	16.25	3.22	19.47
105	Carpenter	30.16	1.36	31.52
106	Carpet Layer or Soft Floor Coverer	23.95	6.48	30.43
107	Cement Finisher	22.46	2.71	25.17
108	Drywall Taper or Finisher	15.50	0.00	15.50
109	Electrician	17.00	13.64	30.64
110	Elevator Constructor	44.94	23.84	68.78
111	Fence Erector	18.52	5.93	24.45
112	Fire Sprinkler Fitter	36.07	18.60	54.67
113	Glazier	37.13	12.32	49.45
114	Heat or Frost Insulator	35.00	0.00	35.00
115	Insulator (Batt or Blown)	18.50	13.98	32.48
116	Ironworker	30.90	19.11	50.01
117	Lather	30.16	1.36	31.52
119	Marble Finisher	16.50	2.38	18.88
120	Marble Mason	23.00	0.00	23.00
121	Metal Building Erector	16.52	1.82	18.34
123	Overhead Door Installer	17.00	0.00	17.00
124	Painter	23.00	11.27	34.27
125	Pavement Marking Operator	28.10	15.00	43.10

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
129	Plasterer	20.00	0.00	20.00
130	Plumber	38.90	0.00	38.90
132	Refrigeration Mechanic	33.00	1.79	34.79
133	Roofer or Waterproofer	17.50	3.73	21.23
134	Sheet Metal Worker	21.03	3.40	24.43
135	Steamfitter	41.20	16.28	57.48
137	Teledata Technician or Installer	19.23	1.46	20.69
138	Temperature Control Installer	21.00	0.00	21.00
139	Terrazzo Finisher	26.57	16.00	42.57
140	Terrazzo Mechanic	30.01	17.13	47.14
141	Tile Finisher	20.60	4.88	25.48
142	Tile Setter	19.00	0.00	19.00
143	Tuckpointer, Caulker or Cleaner	32.50	2.84	35.34
146	Well Driller or Pump Installer	19.00	7.30	26.30
147	Siding Installer	19.07	0.00	19.07

TRUCK DRIVERS

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
201	Single Axle or Two Axle	28.05	4.18	32.23
203	Three or More Axle	20.00	4.37	24.37
205	Pavement Marking Vehicle	20.85	11.02	31.87
207	Truck Mechanic	19.00	1.85	20.85

LABORERS

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
301	General Laborer	19.80	7.22	27.02
302	Asbestos Abatement Worker	18.00	6.24	24.24
303	Landscaper	13.15	6.51	19.66

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
311	Fiber Optic Laborer (Outside, Other Than Concrete Encased)	17.81	12.22	30.03
315	Final Construction Clean-Up Worker	15.00	0.00	15.00

HEAVY EQUIPMENT OPERATORS
RESIDENTIAL OR AGRICULTURAL CONSTRUCTION

CODE	Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
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, TImbco, 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.	31.89	18.20	50.09
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.	28.70	4.91	33.61

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

SECTION I: PAYMENT AND PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____ as principal, and _____ Company of _____as surety, are held and firmly bound unto the City of Madison, Wisconsin, in the sum of _____($_____) Dollars, lawful money of the United States, for the payment of which sum to the City of Madison, we hereby bind ourselves and our respective executors and administrators firmly by these presents.

The condition of this Bond is such that if the above bounden shall on his/her part fully and faithfully perform all of the terms of the Contract entered into between him/herself and the City of Madison for the construction of:

BREESE STEVENS FIELD LIGHTING/SOUND SYSTEM IMPROVEMENTS
CONTRACT NO. 7044

in Madison, Wisconsin, and shall pay all claims for labor performed and material furnished in the prosecution of said work, and save the City harmless from all claims for damages because of negligence in the prosecution of said work, and shall save harmless the said City from all claims for compensation (under Chapter 102, Wisconsin Statutes) of employees and employees of subcontractor, then this Bond is to be void, otherwise of full force, virtue and effect.

Signed and sealed this _____day of _____

Countersigned:

_____
Company Name (Principal)

_____ _____
Witness President Seal

_____
Secretary

Approved as to form:

_____
Surety Seal
☐ Salary Employee ☐ Commission

_____ By _____
City Attorney Attorney-in-Fact

This certifies that I have been duly licensed as an agent for the above company in Wisconsin under License No. _____ for the year 20_____, and appointed as attorney-in-fact with authority to execute this payment and performance bond which power of attorney has not been revoked.

_____ _____
Date Agent

SECTION J: PREVAILING WAGE RATES