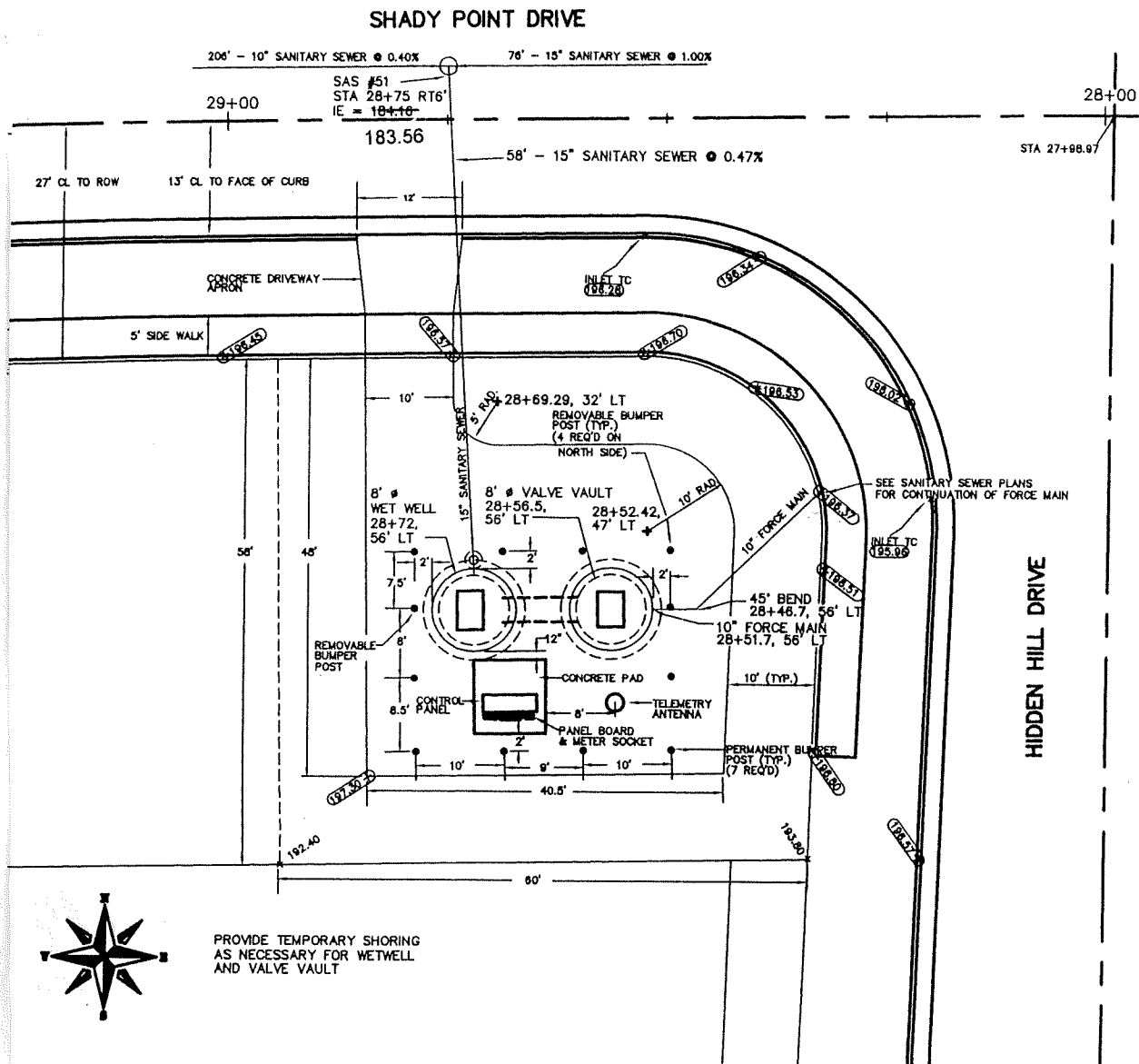
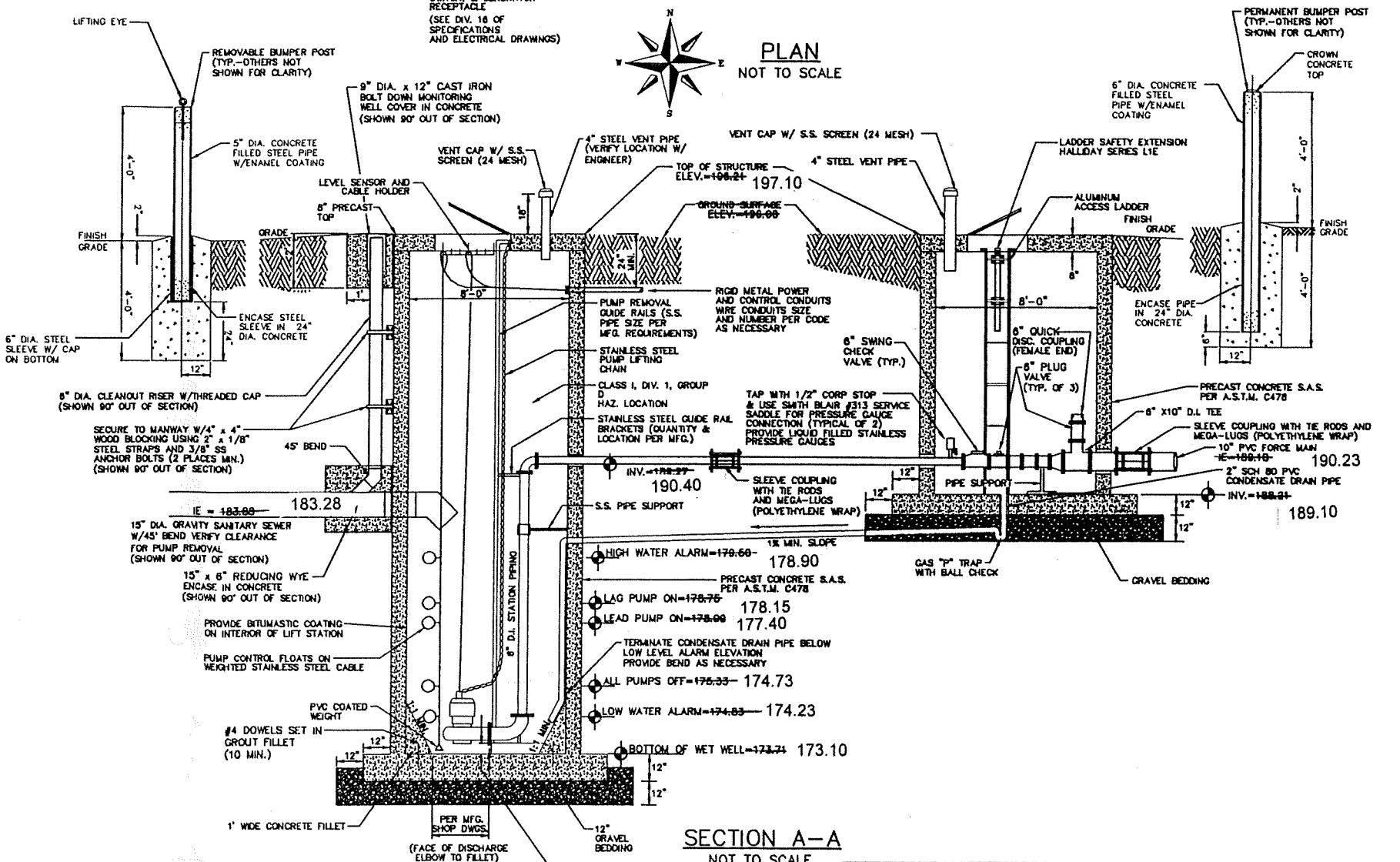
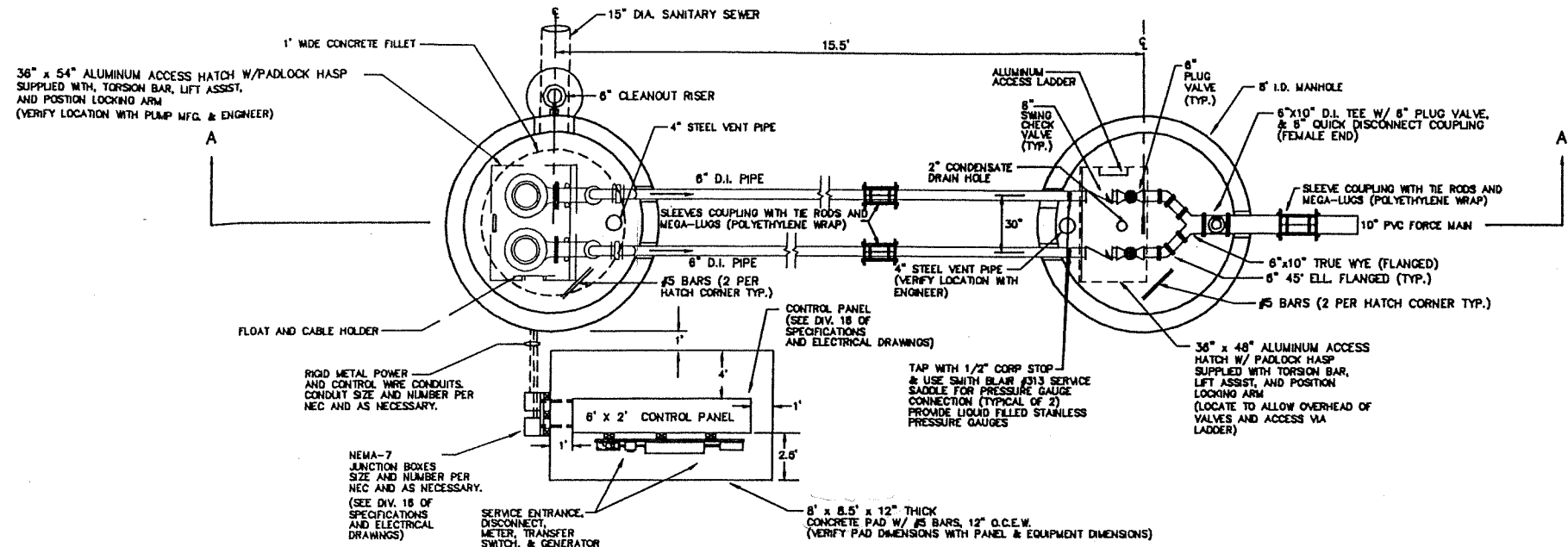


Exhibit A



LIFT STATION SITE PLAN

SCALE: 10' 0 20'



WET WELL AND VALVE VAULT LIFT STATION

REVISIONS		
NO.	DATE	REMARKS
1	7/3/00	8" WW & 10" FM
2	7/11/00	PROJECT NAME
3	7/21/00	LOWER ELEV. & SLOPE
4	9/18/00	ELEV.

SHADY POINT DRIVE LIFT STATION HAWKS LANDING GOLF CLUB ARNOLD & O'SHERIDAN/HAEN REAL ESTATE MADISON, WISCONSIN			
VIERBICHER ASSOCIATES		FILE NO.	
6200 MINERAL POINT ROAD · MADISON WI 53705 · 608-233-5800		JOB NO. 056992578	
DRAWN: SSB	CHECKED: DRP	DATE: 2-00	SCALE: VERT. HORIZ. AS SHOWN
SHEET 2 OF 23		DWG. NO.	

SHADY POINT DRIVE

LIFT STATION DEMOLITION PLAN

REMOVE CONC. APRON & SUBGRADE TO A DEPTH OF 12". PROVIDE 8" OF FILL & 4" OF TOPSOIL, SEED, FERTILIZER & MULCH

EXISTING SAS #1567-007
RIM= 1041.52
IE= 1029.76

EXISTING INLET
1567-018
TC=1041.71
IE=1038.69
7'X7' W/H INLET COVER

EXISTING 12" PVC SANITARY

EX 43"X68" HERCP

RESTORE ALL DISURBED AREAS WITH 4" OF TOPSOIL, SEED & MULCH PER THE "TERRACE RESTORATION" SPECIAL PROVISION

REMOVE AND REPLACE CURB AND GUTTER

CONCRETE COLLAR

INSTALL CONCRETE PLUG

REMOVE AND REPLACE 18" STM PIPE (AS NEEDED)

REMOVE AND REPLACE SIDEWALK

PROPOSED SAS #8

86' 12" SANITARY SEWER @ 0.22%

EXISTING 10" FORCE MAIN

PROPOSED SAS #7

PROPOSED 10" FORCE MAIN

EXISTING INLET
1567-017
TC= 1041.66
IE= 1037.53

EX 18" RCP

EX 15" RCP

HIDDEN HILL DRIVE

INSTALL CONCRETE PLUG (TYP.)

ABANDON SANITARY WITH SLURRY

REMOVE BOLLARDS AND FOUNDATIONS (TYP.) FILL WITH "FILL" OR "SELECT FILL" PER CITY SPECIFICATIONS.

REMOVE ASPHALT PAVEMENT AND BASE TO A DEPTH OF 12". PROVIDE 8" OF FILL AND 4" OF TOPSOIL, SEED, FERTILIZER AND MULCH.

REMOVE CONCRETE SLAB & SUBGRADE TO A DEPTH OF 12". PROVIDE 8" OF FILL & 4" OF TOPSOIL, SEED, FERTILIZER & MULCH.

SALVAGE FLOAT SWITCHES & TREE, CHECK & PLUG VALVES, VALVE VAULT LADDER AND PUMPS FOR OWNER. REMOVE TOP 4' OF VALVE VAULT AND WETWELL STRUCTURES. FRACTURE BASES OF STRUCTURES AND FILL WITH "FILL" OR "SELECT FILL" PER CITY SPECIFICATIONS. PROVIDE 4" OF TOPSOIL, SEED, FERTILIZER AND MULCH OVER FILL.

ABANDON FORCE MAIN WITH SLURRY

SALVAGE ANTENNA AND REMOVE FOUNDATION. FILL WITH "FILL" OR "SELECT FILL" PER CITY SPECIFICATIONS.

ELECTRICAL EQUIPMENT DEMOLITION PLAN

- ① ALLIANT ENERGY DISCONNECTS DIRECT BURY CABLE SWITCH GEAR.
- ② ALLIANT ENERGY REMOVES TRANSFORMER.
- ③ ALLIANT ENERGY REMOVES DIRECT BURY CABLE TO 3' BELOW TRANSFORMER PAD.
- ④ ALLIANT ENERGY REMOVES CONDUCTORS FROM CONDUIT BETWEEN TRANSFORMER AND CONTROL PANEL. CONTRACTOR REMOVES CONDUIT TO 3' BELOW GRADE AT TRANSFORMER AND AT CONTROL PANEL.
- ⑤ CONTRACTOR REMOVES TRANSFORMER CONCRETE PAD.
- ⑥ ALLIANT ENERGY REMOVES METER. CONTRACTOR SALVAGES SERVICE ENTRANCE EQUIPMENT FOR OWNER.
- ⑦ CONTRACTOR SALVAGES CONTROL PANEL FOR OWNER.
- ⑧ CONTRACTOR REMOVES CONDUIT AND/OR CONDUCTORS TO 3' BELOW GRADE AT CONTROL PANEL AND ANTENNA & SALVAGES ANTENNA FOR OWNER.



SHADY POINT DR. LIFT STATION DEMO.
Lower Badger Mill Creek (Mid Town Road) Lift Station,
Force Main & Sanitary Sewer
City of Madison, Wisconsin

REVISIONS		NO.	DATE	REMARKS

SCALE: AS SHOWN
DATE: 7-2009
DRAFTER: TVE/DEHL
CHECKED: DPOP
PROJECT NO.: 013076245.00
SHEET: 8 OF 29
DWG. NO.: 20018

BID OF _____

2009

PROPOSAL, CONTRACT, BOND AND SPECIFICATIONS

FOR

LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER

CONTRACT NO. 6329

IN

MADISON, DANE COUNTY, WISCONSIN

AWARDED BY THE COMMON COUNCIL

MADISON, WISCONSIN ON _____

PLEASE RETURN PLANS AND SPECIFICATIONS TO:

**CITY ENGINEERING DIVISION
1600 EMIL STREET
MADISON, WISCONSIN 53713**

www.cityofmadison.com/business/pw

**LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER
CONTRACT NO. 6329**

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This Proposal, and Agreement have
been prepared by:

**CITY ENGINEERING DIVISION
CITY OF MADISON
MADISON, DANE COUNTY, WISCONSIN**



Robert F. Phillips, Interim City Engineer

RFP:MM:kmr

SECTION A: ADVERTISEMENT FOR BIDS

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

A BEST VALUE CONTRACTING MUNICIPALITY

CONTRACT NO.	PROJECT NAME:
6329	LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER
SBE GOAL	6%

Plans and Specifications are available at 1600 Emil Street, Madison, WI 53713; 608-267-1197 or on our website at www.cityofmadison.com/business/pw/contracts/openforBid.cfm.

PREQUALIFICATIONS

Bidders who have not been prequalified by the City Engineer and Affirmative Action Director for the period of **January 31, 2009 to January 31, 2011** must submit their application on or before 1:00 p.m., **AUGUST 7, 2009**, Room 115, City-County Building, Madison, WI 53703. Postmark is not applicable. Forms are available at the same location or on our website at www.cityofmadison.com/business/pw/forms.cfm.

PRE-BID MEETING

Representatives of the Affirmative Action Department will be present to discuss the Small Business Enterprise requirements on **JULY 31, 2009** at 1:00 PM at 1600 Emil Street, Madison Wisconsin.

OTHER REQUIREMENTS

Sealed bids 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.

Deadline for the Submittal of Bid is **AUGUST 7, 2009** by 1:00 PM, at 1600 Emil Street, Madison, WI 53713.

Bid Opening will be on **AUGUST 14, 2009** at 1:30 PM at 1600 Emil Street, Madison, WI 53713.

REQUEST FOR BIDS FOR PUBLIC WORKS CONSTRUCTION FOR THE CITY OF MADISON, WISCONSIN

A BEST VALUE CONTRACTING MUNICIPALITY

Plans and Specifications for Public Works Projects that are open for bid are available on the City of Madison website at <http://www.cityofmadison.com/business/PW/contracts/openforBid.cfm> or by calling City Engineering at 608-266-4751.

Sealed bids 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.

Bidders must be prequalified with the City Engineer and the Affirmative Action Director. Deadline date for submittal of application is noticed on our website. Forms are available on the web at <http://www.cityofmadison.com/business/pw/forms.cfm> or by contacting City Engineering at 608-266-4620

Publ. WSJ JULY 21 & 24, 2009

SECTION B: INSTRUCTIONS TO BIDDERS

The City of Madison Standard Specifications for Public Works Construction - 2009 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 at www.cityofmadison.com/Business/PW/specs.cfm or by contacting City Engineering Division, Room 115, City-County Building, 210 Martin Luther King Jr. Blvd., Madison, WI 53703.

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 Madison 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 Madison General Ordinances (entitled Affirmative Action) and as required by Section 102.11 of the Standard Specifications.

Section 102.4: Proposals

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 therefore 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. Proposals will be received at the place and until the hour on the date designated in the advertisement. When sent by mail, the sealed proposal marked as indicated above shall be enclosed in an additional envelope. Proposals sent by mail, submitted in person or otherwise delivered must be in the hands of the official conducting the letting by the hour on the date designated in the advertisement. Proposals received after the date designated will be returned to the bidder unopened.

The Bidder shall execute form ERD-7777 (R.9/03), a part of these proposal pages and submit same with the bidder's proposal, if applicable. REFER TO PROPOSAL SECTION.

Section 102.5: Bid Deposit (Proposal Guaranty)

No proposal shall be considered unless either (i) it is accompanied by a bid deposit of the character and amount described in the Advertisement for Bids or (ii) a biennial bid bond in an amount and form acceptable to the City of Madison has been previously submitted.

Bid deposits of unsuccessful bidders shall be returned following the award of the contract by the Common Council. Bid deposit of the successful bidders shall be returned within forty-eight (48) hours following execution of the contract and bond as required.

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

110 Building Demolition

Street, Utility and Site Construction

201 Asphalt Paving

240 Retaining Walls, Precast Modular Units

204 Blasting

244 Retaining Walls, Reinforced concrete

206 Boring/Pipe Jacking

248 Sanitary, Storm Sewer & Water Main Const.

208 Concrete Paving

252 Sewer Lining

212 Con. Sidewalk/Curb & Gutter/Misc. Concrete Work

256 Soil Borings with Public ROW

214 Dredging

260 Street Construction

216 Fencing

264 Street Lighting

220 Grading and Earthwork

268 Traffic Control During Construction

224 Landscaping, Maintenance

272 Traffic Signals

228 Landscaping, Site and Street

276 Traffic Signing and Marking

232 Pavement Sealcoating and Crack Sealing

280 Trucking

236 Petroleum Above/Below Ground Storage Tank Removal/Installation

299 Other _____

Bridge Construction

301 Bridge Construction and/or Repair

Building Construction

401 Carpet Installation

437 Metals

403 Concrete

440 Painting

404 Doors and Windows

445 Plumbing

405 Electrical

450 Pump Repair

410 Elevator

455 Pump Systems

412 Fire Suppression

460 Roofing

413 Furnishings - Furniture and Window Treatments

465 Soil/Groundwater Remediation

415 General Building Construction, Equal or Less than \$250,000

470 Water Supply Elevated Tanks

420 General Building Construction, \$250,000 to \$1,500,000

475 Water Supply Wells

425 General Building Construction, Over \$1,500,000

480 Wood, Plastics & Composites - Structural & Architectural

430 Heating, Ventilating and Air Conditioning (HVAC)

499 Other _____

433 Insulation - Thermal

435 Masonry

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 Other _____

SECTION C: SBE

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.

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.

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 nonresponsible contractor ineligible for award of this contract.

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 Department 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 **Schedule C, SBE Certification Application** to the City of Madison Affirmative Action Department by the time and date established for receipt of bids. A copy of Schedule C is available by contacting the Contract Compliance Officer at the address and telephone indicated in Section 1.2. Submittal of Schedule C 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. 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 Department 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 and engage in negotiation.
- 2.4.1.9 Negotiating directly with SBEs including those which volunteer a bid.
- 2.4.1.10 Utilizing the bid of a qualified and competent SBE when the bid of such a business is deemed reasonable, although not necessarily low.

2.4.2 Reporting SBE Utilization and Good Faith Efforts

The Small Business Enterprise Compliance Report is to be submitted by the bidder in a separate sealed envelope marked: **"ENVELOPE 2 - SBE COMPLIANCE REPORT."** This report is due by the specified bid closing time and date. Bids submitted without a completed SBE Compliance Report as outlined below will be deemed nonresponsive 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 SBE-1; and
- 2.4.2.1.2 **Summary Page**, SBE-2.

- 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 SBE-1;
- 2.4.2.2.2 **Summary Page**, SBE-2; and

2.4.2.2.3 **SBE Contact Report, SBE-3 and SBE-4.** (A separate Contact Report must be completed for each SBE which is not utilized.)

2.5 Appeal Procedure

A bidder which does not achieve the established goal and is deemed nonresponsible 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 Director of Public Works and received within 72 hours of City of Madison's notice. Postmark not applicable.

A bidder which is deemed nonresponsive may not appeal the City's decision to deny eligibility for award of contract.

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. Failure to provide a satisfactory explanation in these variances may result in the City invoking the sanctions contained in Paragraph 5(g) of the Agreement contained within this project manual.

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 City of Madison Affirmative Action Department. The contractor shall submit in writing to the City of Madison Affirmative Action Department a request to change any SBE citing specific reasons which necessitate such a change. The Affirmative Action Department 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 with annual gross receipts of less than \$750,000 when averaged over the past three years period;

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 challenged.

**LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER
CONTRACT NO. 6329**

Small Business Enterprise Compliance Report

Cover Sheet

**This information MUST be submitted in a separate sealed envelope marked
“ENVELOPE NO. 2 - SBE COMPLIANCE REPORT.”**

Prime Bidder Information:

Company: _____

Address: _____

Telephone Number: _____

Contact Person/Title: _____

Prime Bidder Certification:

I, _____, _____ of
Name Title
_____ certify that the information
Company

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

Witness' Signature

Bidder's Signature

Date

LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER
 CONTRACT NO. 6329

Small Business Enterprise Compliance Report

Summary Sheet

This information MUST be submitted in a separate sealed envelope marked
 "ENVELOPE NO. 2 - SBE COMPLIANCE REPORT."

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

Total Percentage of SBE Utilization: _____ %.

**LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER
CONTRACT NO. 6329**

Small Business Enterprise Compliance Report

SBE Contact Report

**This information MUST be submitted in a separate sealed envelope marked
“ENVELOPE NO. 2 - SBE COMPLIANCE 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. 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 Question 5.

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. Provide specific detail for this conclusion including the SBE’s price and the price of the subcontractor you intend to utilize.

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

5. Describe any other good faith efforts:

SECTION D: SPECIAL PROVISIONS

LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER CONTRACT NO. 6329

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" 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

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

ARTICLE 102.12: BEST VALUE CONTRACTING

The Contractor and all Subcontractors shall comply with Madison General Ordinance (MGO) section 33.07(7). The Contractor and all Subcontractors shall participate in a Class A Apprenticeship Program for each separate trade or classification in which it employs craft employees and shall continue to participate in such program or programs for the duration of the project. The Contractor or Subcontractor shall not be required to have an apprentice on this project in order to be in compliance with MGO 33.07(7).

The Contractor shall complete pages E-3 and E-4 entitled, "Best Value Contracting."

This Contract shall be considered a Best Value Contract if the Contractor's bid is equal to or greater than \$48,000 for a single trade contract; or equal to or greater than \$234,000 for a multi-trade contract pursuant to Wis. Stat. sec 66.0903(5).

In addition, this contract shall be exempt from Best Value Contracting requirements if the Contractor provides information prior to the award of contract sufficient such that the City Engineer makes a finding that the contracted work is not considered apprenticeable.

Each Contractor or Subcontractor shall comply individually with MGO 33.07(7).

If the Contractor cannot comply with the requirements of MGO 33.07, the City Engineer shall designate the Contractor's bid non-responsive and this Contract shall not be awarded to the Contractor. The Contractor shall promptly provide the City Engineer with addition information as required by the City Engineer to substantiate the means in which the Contractor intends to comply with MGO 33.07(7).

The Contractor shall insure that each subcontractor used complies with MGO 33.07(7). For each Subcontractor used, the Contractor shall provide all the information required of the General Contractor as indicated above. This information shall be provided prior to beginning work on the Contract. The

Contractor shall not subcontract any portion of this contract to a Subcontractor who cannot comply with the provisions of MGO 33.07(7).

If the Contractor cannot provide the City Engineer sufficient information to substantiate the Contractor's compliance with MGO 33.07(7) within four (4) days of the bid opening as determined by the City Engineer, the City Engineer may designate the bid unresponsive.

If the City Engineer designates the Contractors bid unresponsive, the City Engineer shall notify the Contractor in writing that the Contractor's bid has been designated unresponsive. The City Engineer's decision 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.

SECTION 104 SCOPE OF WORK

This project involves the installation of a new lift station, abandoning a lift station, installing 78 feet of 27-inch gravity sanitary sewer main, 1,215 feet of 12-inch gravity sanitary sewer main, and 1,143 feet of Sanitary Sewer Force Main, and reconstruction of a 22' wide road.

The Contractor shall view the site prior to bidding to become familiar with the existing conditions. It will be the responsibility of the Contractor to work with the utilities located in the right of way to resolve conflicts during the construction process.

SECTION 104.4 INCREASE OR DECREASE QUANTITIES

The Contractor shall note that some bid item quantities may increase or decrease based on what is encountered in the field. If the actual field conditions vary from the plan quantity, no additional compensation shall be given for increasing or decreasing quantities. Any overruns shall be paid for under the appropriate bid item(s) without any penalty or change to the bid price for the associated bid item. The Contractor shall not be reimbursed for any deletions to the contract. No change to the unit bid price will be allowed for changes to the quantities.

SECTION 105.9 SURVEYS, POINTS AND INSTRUCTIONS

The Engineer will provide a one-time staking for the sanitary sewer, force main, wet well, and valve vault. The Contractor shall provide the Engineer a 48-hour notice prior to the time the Contractor needs stakes. Any restaking needed after the initial staking has been completed shall be charged to the Contractor on a time and materials basis.

ARTICLE 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

The General Contractor is responsible for the underground work and coordination with all of the subcontractors, which he or she has contracted with for the work described on the Plan and in the Specifications. The General Contractor is also responsible for coordination with gas, cable and telephone companies insofar as those utilities affect the schedule and methods of construction by the General Contractor.

There is a monument in the center of Mid Town Road immediately south of the proposed lift Station (Approximately STA 10+61). The Contractor will be responsible to contact City of Madison at least 72 hours prior to removal of the monument. Please contact the Construction Engineer, John Fahrney 266-9091. City Surveyors must locate the monument, prior to removal. The Contractor will be responsible to supply the traffic control and protection of the City Surveyors for all the work required to remove and reinstall the monument.

Bid Item 30401 Reset Monument (Each)

Lift Station vaults will not be allowed to be installed while the ground is frozen because of the problems encountered in the past with other Lift Station Installations. Lift Station vaults will not be allowed to be installed from Nov. 18th thru April 15th.

SECTION 107.7 MAINTENANCE OF TRAFFIC

All traffic control shall conform to Part VI of the Federal Highways Administrations "Manual on Uniform Traffic Control Devices" (MUTCD), the State of Wisconsin Standard Facilities Development Manual (including Chapter 16 – Standard Detail Drawings) and the City of Madison Standards for sidewalk and bikeway closures.

A traffic control plan for Phase 1 is provided in the plan set. The Contractor will be responsible for installing and maintaining traffic control in accordance with the Traffic Control Plan and as directed by the City Traffic Engineer. The traffic control plan is a schematic representation of the traffic control. It shall not be considered to scale.

The Contractor shall submit an acceptable, complete Traffic Control Plan for Phase 2 and Phase 3, including all necessary phases and any required sidewalk or bike route closures, to the office of the City Traffic Engineer, at 215 Martin Luther King, Jr. Blvd, Suite 100, Madison, WI 53703, a minimum of five (5) working days, prior to the pre-construction meeting. The Traffic Control Plan shall address all requirements of this section of the Special Provisions. The contractor shall not start work on this project until the Traffic Engineering Division has approved a traffic control plan and traffic control devices have been installed, in accordance with the approved plan. Failure of the Contractor to obtain approval of a Traffic Control Plan, as specified above, may prevent the Contractor from starting work and shall be considered a delay of the project, caused by the Contractor.

Moving traffic control devices, as construction progresses shall be considered incidental. The Contractor

shall also install and maintain modifications or additions to the traffic control, as directed by the City Traffic Engineer, at no cost to the City.

The General Contractor shall be responsible for making daily inspections of the traffic control to ensure that all required signs are in place and all warning lights are functional.

Mid Town Road and Hidden Hill Drive may be closed to through traffic, at the project limits, for the duration of the project. Local and emergency vehicle access shall be maintained at all times. The duration of the closure shall be minimized.

All informational signs ("MID TOWN RD. CLOSED AT HIDDEN HILL DR., DATE TO DATE") shall be installed one week ahead of road closure.

Prior to construction, the Contractor shall provide the Engineer, City and local police department with the name and telephone number of a local person responsible for emergency maintenance of traffic control.

The Contractor may remove parking on Hidden Hill Drive within the project limits as indicated on the Traffic Control Plan. The Contractor shall be responsible for posting and maintaining NO PARKING signs in accordance with City of Madison Police Department's "Guidelines for Temporary No Parking Restrictions for Construction or Special Events".

The work areas shall be backfilled, plated, or protected by traffic control devices during non-working hours. If steel plates are used, the Contractor shall notify the City of Madison Streets Division, 266-4681, one (1) working day prior to placement of the plates.

The Contractor shall provide ADA/Handicap Accessible pedestrian access, where such accommodations are originally available, at all intersections within the construction area at all times.

Access to properties and driveways may only be interrupted, when necessary for the construction of improvements, and only after at least three (3) working days advance notice to the property owners and occupants.

No construction equipment or materials shall be stored in the roadway or street right-of-way that is open to traffic during non-working hours. Construction equipment and materials are not to be stored within the street right-of-way that is outside the project limits as shown on the approved plan.

Contact Yang Tao, Traffic Engineering Division, 266-4815, with any questions concerning these traffic control specifications.

SECTION 107.8 NOTIFICATION WHEN CLOSING STREET

The Contractor shall not remove traffic signs. For removal or replacement of traffic and parking signs, contact the City of Madison Traffic Engineering Field Operations, 1120 Sayle Street, 266-4767, 8:00 a.m. to 4:00 p.m., a minimum of one (1) working day in advance of when any existing signs need to be removed. This service is provided free of charge. If the Contractor removes the signs, the Contractor will be billed for the reinstallation of, and any damage to, the signing equipment.

SECTION 107.10 OPENING OF SECTION OF HIGHWAY TO TRAFFIC

Upon completion of all concrete work, final surface course of pavement, landscaping, topsoil, seed or sod, the City Construction Engineer shall certify that it is complete and shall contact the City of Madison

Traffic Operations Section, 266-4767. The Contractor shall leave all barricades and traffic control in place until such time that the permanent pavement marking and signing has been installed by the City. The City shall notify the Contractor when the final pavement marking and signing is complete and the Contractor shall remove all temporary construction signs and barricades within 24 hours of the notification.

SECTION 108.2 PERMITS AND LICENSING

The City of Madison shall submit a DNR Notice of Intent (NOI) to obtain coverage under the Construction Site General Permit No. WI-S067831-2 for construction site erosion control.

The Contractor shall meet the conditions of the permit by properly installing and maintaining the erosion control measures shown on the plans, specified in these Special Provisions, or as directed by the Construction Engineer or his designees. This work will be paid for under the appropriate contract bid items or, if appropriate items are not included in the contract, they shall be paid for as Extra Work. A copy of the permit is available at the City of Madison, Engineering Division office.

The NOI permit covers trench dewatering to a maximum of 70 gallons/minute from the project provided appropriate control measures are in place. The City's obtaining this permit is not intended to be exhaustive of all permits that may be required to be obtained by the Contractor for construction of this project. It shall be the responsibility of the Contractor to identify and obtain any other permits needed for construction. Type II dewatering is being bid with this project. WDNR reporting requirements for the Type II dewatering shall be the responsibility of the Contractor.

The Contractor is responsible for making the electrical service application, obtaining permits, paying fees, coordinating the work of the electrical utility (Alliant Energy) and providing all equipment and work required to install the electric service to the lift station.

SECTION 109.2 PROSECUTION OF WORK

The Contractor shall begin work on or before **OCTOBER 5, 2009**. The project as a whole shall be completed by June 1, 2010. Due to the late project startup and the long duration to obtain the Lift Station equipment, this project will have interim completion dates deadlines as follows.

PHASE 1 October 5, 2009 - November 18, 2009

This phase of construction will include the underground utility work on Midtown Road from the Lift Station on Mid Town Road up to STA 42+25 on Hidden Hill Drive. This will include the installation of all manhole vaults, manholes, gravity sewer, the force main, the binder course on Mid-Town Road, and the binder course on Hidden Hill. Lift Station vaults will not be allowed to be installed while the ground is frozen because of the problems encountered in the past with other Lift Station Installations. Lift Station vaults will not be allowed to be installed from Nov. 18th thru April 15th. Upon completion of the Hidden Hill and Mid Town Road construction, the road shall be reopened to through traffic. It is anticipated that during this time period, the pumps, controls, internal piping equipment will be installed.

PHASE 2 (Early Spring 2010)

This phase will include field testing the Lift Station with clear water. The contractor will excavate to the force main stub at STA 42+35 on Hidden Hill, attach a flexible 10" diameter hose to the city sanitary manhole SAS 1567-008. Clearwater will be obtained from the hydrant at the west side of Hidden Hill STA 18+91 LT 36' and connecting it to SAS #6 (STA 19+32.62 LT 5').

PHASE 3 (April 15th - June 1st)

This phase will include installing the gravity sewer from SAS #7 to SAS #8, making the final force main connection to the existing force main. Finally, the Shady Point Lift Station will be demolished and final pavement will be installed on Hidden Hill and Midtown Road. There will be temporary force main piping/ bends necessary to allow for the installation of SAS#7. This shall be incidental to the force main installation Bid Item 90071.

Work shall begin only after the start work letter is received. If it is desirable to begin work before the above-mentioned date, the Contractor shall establish a mutually acceptable date with the City Engineer. The Contractor shall limit workdays to 7:00 A.M. to 7:00 P.M.

If the contractor would prefer to do the force main reconnection between the hours of 7:00 pm and 7:00 am, a noise variance would be necessary requiring a public hearing, Board of Public Works and Common Council approval. If the contractor would prefer to do the final force main connection during these hours, upon being awarded the Bid, the contractor shall request a noise variance to Mark Moder (261-9250, mmoder@cityofmadison.com) so that the process to acquire a variance can be initiated.

BID ITEM 20101 -EXCAVATION CUT

Excavation quantities to finished grade are included in Bid Item Excavation Cut. Any other work involving the final grading, placement of fill and placement of topsoil shall be incidental to their respective Bid Items. Please note that it is expected that the majority of material obtained on-site through excavation cut shall be placed as Fill in other areas of the project as specified in Article 201-EXCAVATION CUT and Article 202 - FILL of the Standard Specifications. All materials obtained through excavation cut and placed as Fill or Select Fill shall comply with the specifications in paragraph 202.3(c) - Special Compaction, in the Standard Specifications and shall approved by the City Engineer prior to placement.

BID ITEM 20109 – FINISH GRADING

The General Contractor will be required to regrade after all underground construction activities have ended. The final grades, which will be used for a base to install stone base, bituminous pavement, and topsoil, shall be required to be within 0.05' of elevations given on the Plans.

BID ITEM 20217 – CLEAR STONE 3”

DESCRIPTION

Clear Stone shall meet the requirements for Gradation Number One (No. 1) of the Standard Specifications, commonly known as three-inch clear stone. The clear stone shall be utilized in **BID ITEM 21014 - CONSTRUCTION ENTRANCE** and as part of the construction of **BID ITEM 21013 - CLEAR STONE BERM.**

METHOD OF MEASUREMENT

Clear Stone shall be measured by the ton in place.

BASIS OF PAYMENT

Clear Stone shall be paid at the contract price for work as described and measured above including all work, materials, labor, and incidentals.

BID ITEM 21004 – EROSION MATTING CLASS I TYPE B

Work under this bid item shall be in accord with the City of Madison Standard Specifications for Public Works Construction. This item shall be used on the graded flow channels and the steep sideslopes as directed by the Construction Engineer. Where erosion matting is used, mulch shall not be used as part of the seeding.

BID ITEM 21013 – CLEAR STONE BERM FOR EROSION CONTROL

Work under this item shall include installation of an erosion control berm as directed in the field for erosion control. This item shall include the following:

1. Typical berm height of three (3) feet
2. Depth of berm from front to back will vary with height but will typically include 1:1 slopes and a two (2) foot flat top. So for standard height the depth will be eight (8) feet;
3. Width as determined in the field;
4. Consist of three (3) inches clear stone **paid under BID ITEM 20217**;

Payment shall be on as each berm is constructed, and includes all necessary maintenance (as directed by the Construction Engineer) and removal of the berm. Payment for the required stone shall be per ton and paid under **BID ITEM 20217**.

BID ITEM 21014 - CONSTRUCTION ENTRANCE

Work under this bid item shall be in accord with the City of Madison Standard Specifications for Public Works Construction. The Construction Engineer shall locate construction Entrances and the Contractor based on site needs.

BID ITEM 90001 - HACKBERRY

This work shall be completed in accordance with the requirements of Article 209 of the City of Madison standard specifications for public works construction, except as stated herein.

Trees shall Hackberry, C. Occidentalis, 2 ½ inch caliper, and 12 to 15 feet height (Type 1 according to American Standard for Nursery Stock (ANSI Z60.1-current edition). Trees shall be planted between Nov. 2, 2009 and Nov. 13th, 2009. Tree pits shall be backfilled using backfill material as specified in section 209.5. Backfill material shall be incidental to this bid item.

BID ITEM 90002 - MULTI STEM SERVICE BERRY TREES

This work shall be completed in accordance with the requirements of Article 209 of the City of Madison standard specifications for public works construction, except as stated herein.

Trees shall be Multi Stem Service Berry Trees Amelanchier x Grandiflora ‘Autumn Brilliance’, 3 ½ inch caliper, 6 to 8 feet height (Type 1 according to American Standard for Nursery Stock (ANSI Z60.1-current edition). Trees shall be planted between Nov. 2, 2009 and Nov. 13th, 2009. Tree pits shall be backfilled using backfill material as specified in section 209.5. Backfill material shall be incidental to this bid item.

ARTICLE 501 – SEWERS AND SEWER STRUCTURES

SANITARY SEWER GENERAL

Sanitary sewer pipe work shall include installing new PVC SDR 35, SDR 26, AWWA C900 (force main) at the sizes and locations that are specified on the plan set and in accordance with the Standard Specifications. Both pipe types, SDR-35 and SDR-26, shall be paid for under the same bid item for each pipe size.

All new sanitary sewer access structures shall include the Neenah R-1550-0054 with the new City of Madison casting detail (see S.D.D. 5.7.16 of the City of Madison Standard Specifications for Public Works Construction 2009 ed.). All new sewer main connections may be factory cored and shall be included in the structure. All sewer main and/or laterals not slated for replacement that are damaged during the installation of a structure shall be replaced by the Contractor and shall be considered incidental to the project. All benches and flowlines shall have a smooth trowel finish.

It is advised that the Contractor visit the site prior to bidding to determine the type of trench protection that will be necessary for the sanitary sewer main installation

BID ITEM 50390 – SEWER ELECTRONIC MARKERS

With regard to the City of Madison Standard Specifications for Public Works Construction 2008 Edition Section 503.3(c), each sanitary lateral shall have a minimum of two (2) electronic markers with the City providing the Contractor with the required number of electronic markers. For sanitary laterals, which only include the installation of a wye, A marker ball shall be installed directly above the wye connection to the main.

BID ITEM 50801 – UTILITY LINE OPENING (ULO)

The work under this item shall be completed in accordance with Article 508 of the Standard Specifications for Public Works Construction. It is the discretion of the contractor to locate utilities by either a trench excavation or by a pothole technique. However, the contractor shall not be compensated more than once for multiple utilities located within a maximum distance of ten (10) feet long.

BID ITEM 90070– ABANDON LIFT STATION

DESCRIPTION

Work under this bid item shall be the in place abandonment of the Shady Point Lift Station after the proposed gravity sewer to the Lower Badger Mill Creek (Mid-Town Road) Lift Station, Force Main and Sanitary Sewer has been constructed, tested, accepted and is fully functional. The contractor shall arrange disconnection of electrical service to the Lift Station by the local utility company (Alliant Energy). The Contractor shall perform and coordinate equipment removal with MMSD including the removal of sewage pumps, motors and controls. All Equipment shall be delivered in good condition by the Contractor to the Nine Springs Wastewater Treatment Plant at 1610 Moorland Road in the City of Madison. The contractor shall provide two full work days for MMSD to salvage other equipment once the station is out of service. The contact from MMSD regarding salvaging equipment is Contact Dan McAdams at MMSD at 222-1201 Ext 248.

All piping into and out of the wet well and dry well shall be plugged with concrete prior to filling the wells with sand. The wet wells shall be pumped out and flushed clean prior to plugging all piping and filling with sand. Pumping the lift station dry and disposing of the wastes shall be done in accordance

with Chapter NR113 of the Wisconsin Administrative Code. The floors of the station shall be broken through such that they will drain dry. Roofs and access hatches shall be removed from the structure. If the access hatches can be salvaged and are determined by the Construction Engineer to be in good condition, they shall be delivered to the field yard @ 1602 Emil Street. The walls of the structure shall be removed to 4 foot below the existing ground. All concrete pavement, asphalt, concrete structures, bollards, and other removed unsuitable or excess fill material shall be hauled off site as property of the Contractor. The Lift Station site shall be brought up to grade with suitable fill material and 4" of Topsoil, seed, fertilizer and mulch.

The newly installed gravity sanitary sewer that has been tested and approved shall not be exposed during the lift station demolition process.

METHOD OF MEASUREMENT

ABANDON LIFT STATION shall be measured by the Lump Sum.

BASIS OF PAYMENT

ABANDON LIFT STATION shall be measured as described above and shall be paid for at the contract price which shall be full compensation for all work, materials labor and incidentals required to complete the work set forth in the description.

BID ITEM 90071- SANITARY SEWER FORCE MAIN - 10" PVC

DESCRIPTION

This work shall consist of excavating required trenches, furnishing and laying therein PVC force main, including all necessary fittings, bedding, backfill, labor, tools supplies, materials and any and all items necessary to complete work in accordance with the Plans and Articles 501, 502, & 503 of the City Specifications.

Materials

Force main pipe to be PVC, AWWA C900, Class 150 (DR-18) as specified in Article 503.2(c) of the City Specifications. Fittings shall be ductile iron mechanical joints as specified in Article 503.2(c) of the City Specifications. For the directional drill portion of the project, the fittings shall be C900/RJ Restrained Joint PVC Pipe with CertainTeed's Certa-Lok restrained joints or approved equal. Buttresses shall be high early strength concrete. Solid concrete blocks may be used when approved by the City Construction Representative.

Construction Methods

Construction methods shall conform to the Plans and Article 503.3 of the City Specifications.

Open Cut

It is intended for the portion of force main from STA 10+60 to the Force Main tie in at STA 42+55 (Intersection of Hidden Hill Drive & Shady Point Drive) will be installed by open trench methods of construction.

All fittings shall be buttressed. In addition to concrete buttresses, all mechanical joint fittings are to be restrained by retainer glands (Megalug) or tie rods. This includes but is not limited to tees, crosses,

bends, valves, sleeves, and reducers. One joint upstream and one joint downstream of all fittings shall be restrained by retainer glands (Megalug) or tie rods.

Direction Drill

It is intended for the portion of the forcemain under wetlands at STA 10+60 using directional drill method. This is being contemplated to prevent disturbance of the wetlands. The unit price for 6" Sanitary Sewer Forcemain shall include the pavement rehabilitation necessary for required pits for the directional drill operations.

The material for forcemain used during the directional drill operation shall be C900/RJ Restrained Joint PVC Pipe with CertainTeed's Certa-Lok restrained joints or approved equal.

Connection to Existing Force Main: Contractor shall be responsible for dewatering existing force main prior to making connection between new and existing force main. The Force Main Connection shall be done between 9:30 A.M. and 12:00 P.M. Contractor shall be responsible for coordination and cost of sewage hauling and disposal. Contractor shall notify City 48-hours prior to shutting down lift station and dewatering force main.

If the contractor would prefer to do the force main reconnection between the hours of 7:00 pm and 7:00 am, a noise variance would be necessary requiring a public hearing, Board of Public Works and Common Council approval. If the contractor would prefer to do the final force main connection during these hours, upon being awarded the Bid, the contractor shall request a noise variance to Mark Moder (261-9250, mmoder@cityofmadison.com) so that the process to acquire a variance can be initiated.

Sanitary Sewer/ Force Main Trench Cross-Section Detail/Plan

Contractor shall submit a cross section detail of the sanitary sewer/force main trench for stations 15+75 to 19+07 on Mid Town Road. Detail shall adequately show and describe Contractor's proposed method for excavation, installation and compaction of sanitary sewer and force main stepped trench.

Tracer Wire

Contractor shall install 12 gauge Tracer Wire and tracer wire access boxes in accordance with section 503.2 of the Standard Specifications. Tracer Wire shall be paid for und BID ITEM 50371 Tracer Wire and Box.

Pressure Testing

The force main shall be installed and tested prior to making the final connection. Pressure testing shall be done in conformance with 501.3(c) of the City of Madison Standard Specifications for Public Works Construction- 2009 edition.

There will be temporary force main piping/ bends necessary to allow for the installation of SAS#7. This shall be incidental to the force main installation.

METHOD OF MEASUREMENT

SANITARY SEWER FORCE MAIN – 10" PVC shall be measured by the linear foot.

BASIS OF PAYMENT

SANITARY SEWER FORCE MAIN – 10” PVC will be measured and paid at the contract unit price per lineal foot. This price shall be full compensation for all excavation, bedding, native backfill, compacting, buttresses, restraint, testing, connection to existing force main and furnishing all materials, fittings, tools, equipment, labor, and any and all items necessary to complete the work in accordance with the Contract Documents.

BID ITEM 90072-- SANITARY SEWER LIFT STATION

DESCRIPTION

This work shall include, but not necessarily be limited to, site clearing and grubbing, excavation for the lift station structures (wet well and valve vault) and lift station piping, construction of the lift station, electrical service equipment and installation, lift station site grading, crushed stone, 3.25” asphaltic pavement for driveway & Lift Station area as specified on plan, 6” base course, concrete slabs, connection to force main and to sanitary sewer, restoration of the site, and furnishing all labor, tools, supplies, materials, equipment and any and all items necessary to provide a complete and properly operating lift station in accordance with the Plans and all related sections of the Specifications (including, but not limited to Section 11306 – Submersible Lift Station, and Division 16 of these Specifications and Plans). Undercut shall be paid for separately under Bid Item 20101- Excavation Cut. Topsoil and Seed shall be paid for separately under Bid Item 20221- Topsoil 4” and Bid Item 20701 – Sun Terrace Seeding.

Prior to ordering the lift station equipment, six copies of shop drawings and product information shall be submitted to the Engineer for review and approval. Refer to Section 11306 for more details.

The Contractor is responsible for making the electrical service application, obtaining permits, paying fees, coordinating the work of the electrical utility (Alliant Energy) and providing all equipment and work required to install the electric service to the lift station. The Alliant Energy project contract person is Denise Gevelinger (845-1129). The division of work required for the electrical service installation per Denise Gevelinger of Alliant Energy includes, but is not necessarily limited to, the following:

- Contractor installs transformer pad and primary (from pole to transformer) conduit sweeps under transformer pad
- Alliant furnishes and installs transformer
- Alliant furnishes and installs primary conductors from overhead line to transformer pad conduit sweeps
- Contractor provides conduits from transformer pad to CT (current transformers) cabinet
- Alliant furnishes and installs conductors from transformer pad to CT cabinet
- Contractor furnishes and installs CT cabinet and meter socket
- Alliant furnishes and installs CTs and meter

Refer to the most current edition of the “Electric Service Rules” publication from Alliant Energy to confirm the scope of work that will and will not be provided by the Utility. All work not provided by Alliant Energy which is required to provide electrical service to the lift station shall be provided by the Contractor.

METHOD OF MEASUREMENT

SANITARY SEWER LIFT STATION, as described above, shall be measured by the Lump Sum for all work complete and accepted.

BASIS OF PAYMENT

SANITARY SEWER LIFT STATION, as provided above, shall be paid for at the contract price which shall be full compensation for all site clearing and grubbing, excavation for the lift station structures (valve vault and wet well) and lift station piping, construction of the lift station including but not limited to pumps, piping, valves, controls, all fees and costs required to provide electrical service to the lift station site, electrical service equipment, lift station site grading, 3.25" asphaltic pavement for driveway & Lift Station area as specified on plan, 6" base course, concrete slabs, connection to force main and to sanitary sewer, restoration of the site, and furnishing all labor, tools, supplies, materials, equipment and any and all items necessary to provide a complete and properly operating lift station and to complete the work in accordance with the Specifications and Plans. The cost of furnishing and installing the Sanitary Sewer Lift Station shall be included in the "Sanitary Sewer Lift Station" lump sum bid item.

BID ITEM 90073- SALVAGED TOPSOIL

DESCRIPTION

Work under this bid item include stripping topsoil on the Lift Station Site and stockpiling it west of the excavation area on the lift station site. Alternatively, the owners, Guy and Laura Dreger, may request that the topsoil be stockpiled on their property just west of the Lift Station site. It shall be up to the Construction Engineer as what qualifies as Topsoil that is acceptable for stockpiling and what is unacceptable and will require being moved offsite by the contractor. Just west of the stockpiled topsoil, erosion measures shall be installed and shall be paid for under their separate bid items.

METHOD OF MEASUREMENT

SALVAGED TOPSOIL shall be measured by the Square Yard.

BASIS OF PAYMENT

SALVAGED TOPSOIL shall be measured as described above and shall be paid for at the contract price which shall be full compensation for all work, materials labor and incidentals required to complete the work set forth in the description.

BID ITEM 90170 - PAVEMENT MARKING EPOXY, 4-INCH,DOUBLE YELLOW

All aspects of Wisconsin Department of Transportation 2008 standard specifications, Part 6 Section 646 shall apply except as noted, including description, materials, construction, and payment. Payment will be per linear foot of two 4" solid yellow lines constructed. Construction should also be done in accordance with City of Madison standard detail drawing 6.37.

Pavement markings shall be installed immediately following Phase 1 of construction before Mid Town Road is open for traffic, and shall be maintained until end of the project.

SECTION 11306 – SANITARY SEWER LIFT STATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. The plans indicate the work to be performed. In the event of any discrepancies between the plans and these specifications, the decision of the Engineer shall be decisive thereon. The figured dimensions on the plans are to be taken as correct, but the Contractor is required to carefully check all dimensions of structures before beginning work thereon. Should any errors be found, the Engineer's attention shall be called to the same, and the corrections shall be made. All notes on the plans shall be carefully observed by the Contractor.

1.2 SUMMARY OF WORK INCLUDED

- A. This work shall consist of furnishing and installing a duplex pump sanitary sewer lift station, complete with necessary excavation, dewatering, concrete wet well and separate concrete valve vault, submersible sewage solids handling pumps, pump lift rail system, internal piping, valves, control panel, electrical controls, connection to electric service, connection to sanitary sewer and force main, backfill, start-up services, operation and maintenance manuals, and cleanup to provide a complete, operable system, all as shown on the plans and specified herein.
- B. Related Articles & Sections: The following articles from the City of Madison Standard Specifications for Public Works Construction and other sections of these Specifications contain requirements that relate to this Section:
 - 1. Article 502 - Trenching, Excavation, Bedding, and Backfill.
 - 2. Article 503 - Sanitary Sewer Pipes and Laterals
 - 3. Article 507 – Sewer Structures
 - 4. Division 16 – Electrical Systems
- C. Electric service to the site will be paid directly by the Owner to the Utility Company. Coordination with the Utility Company and location of the meter pedestal shall be the responsibility of the Contractor.

1.3 QUALITY ASSURANCE

- A. It is the intent of these specifications to procure a quality product by an established manufacturer of the latest design. All pumping equipment furnished under this Section shall be of a design and manufacture that has been used in similar applications and it shall be demonstrated to the satisfaction of the Owner that the quality is equal to equipment made by manufacturers specifically named herein.

- B. Unit responsibility. Pump(s), complete with motor, base elbow, and removal system shall be furnished by the pump manufacturer to ensure compatibility and integrity of the individual components, and provide the specified warranty for all components. The pull-up submersible solids-handling pump(s) and motor(s) specified in this section shall be furnished by and be the product of one manufacturer.
- C. Pumps are to be engineered and manufactured under a written Quality Assurance program. The Quality Assurance program is to be in effect for at least ten years, to include a written record of periodic internal and external audits to confirm compliance with such program. Pump(s) are to be engineered and manufactured under the certification of ISO-9001:2000.
- D. All materials shall be designed to withstand stresses encountered in operation, fabrication, and erection. All equipment shall be of corrosion resistant materials or shall be suitably protected by the supplier with corrosion resistant industrial coatings approved by the Engineer.
- E. It is the intent of this Contract that the Contractor furnish all material and equipment to construct, erect, and install the complete lift station including electrical service ready to operate as specified.
- F. All permits and bonds to operate on streets and highways and arrangements for electrical service shall be the responsibility of this Contractor and any such costs shall be included in the lump sum Contract Price.

1.4 CODES, STANDARDS AND REFERENCES

- A. The lift station shall meet all requirements of Chapter NR 110.14, Wisconsin Administrative Code.
- B. The lift station and associated appurtenances shall meet the requirements of the following standards as referenced in the text of these specifications:
 - 1. American National Std. Institute (ANSI) / American Water Works Assoc. (AWWA)
 - a. ANSI B16.1 – Cast iron pipe flanges and flanged fittings.
 - b. ANSI/AWWA C115/A21.15 – Cast/ductile iron pipe with threaded flanges.
 - c. ANSI 253.1 – Safety Color Code for Marking Physical Hazards.
 - d. ANSI B40.1 – Gages, Pressure and Vacuum.
 - e. AWWA C508 – Single Swing Check Valves.
 - 2. American Society for Testing and Materials (ASTM)
 - a. ASTM A48 – Gray Iron Castings.
 - b. ASTM A126 – Valves, Flanges, and Pipe Fittings.

- c. ASTM A307 – Carbon Steel Bolts and Studs.
 - d. ASTM A36 – Structural Steel.
3. Institute of Electrical and Electronics Engineers (IEEE)
- a. IEEE Std 100 – Standard Dictionary of Electrical Terms.
 - b. IEEE Std 112 – Test Procedure for Polyphase Induction Motors.
 - c. IEEE Std 242 – Protection of Industrial and Control Power Systems.
4. National Electric Code (NEC) / National Electrical Manufacturers Assoc. (NEMA)
- a. NEC – National Electrical Code.
 - b. NEMA Std MG1 – Motors and Generators.
5. Miscellaneous References
- a. Ten-State Standards – Recommended Standards for Sewage Works.
 - b. Hydraulic Institute – Standards for Centrifugal, Rotary, and Reciprocating Pumps.
 - c. City of Madison Standard Specifications for Public Works Construction, 2007 Edition, hereafter referred to as the "City Standard Specifications."

1.5 WARRANTY

- A. Pump and removal rail system manufacturer shall warrant units being supplied against defects of workmanship and material for a period of five (5) years under normal use, operation, and service starting at the date of installation acceptance by the Owner and as issued by Engineer. The warranty shall be in printed form and shall be provided with shop drawing submittal and operation and maintenance manuals.
- B. All other equipment manufacturers shall warranty for a period of one year from the date station is placed into operation or eighteen months from date of shipment, whichever occurs first, that the station and all equipment therein shall be free from defects in design, materials and workmanship. In the event a component fails to perform as specified by Engineer, or as represented by the manufacture, or is proven defective during the guarantee period, the manufacturer will replace, repair, or satisfactorily modify the component without cost of parts, shipment, or labor to the Owner. Normal use items, such as grease, light bulbs, mechanical seals, packing and belts are excluded.
- C. The Contractor shall warranty, in writing, all work and equipment items of the pump station for a period of one year (except 5 years for pumps and removal rail system) from the date of final acceptance by the Owner and as issued by the Engineer.

1.6 SUBMITTALS

- A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections. At least three (3) copies of all submittals are required.
1. A complete shop drawing submittal for the lift station pumps shall be furnished for review. The submittal shall include, as a minimum, the following:
 - a. Names of manufacturer, supplier, local source of service, and supply for parts and replacement.
 - b. Complete product information for pumps:
 - i. Factory certified performance curve indicating that each pump is capable of providing desired flow rate at required operating head.
 - ii. Efficiency at operating point
 - iii. Brake horsepower
 - iv. Parts list and spare parts stocking recommendations
 - v. Mounting and guide system
 - vi. Access equipment
 - vii. Complete assembly and installation drawings
 - viii. Certificate of shop tests for defects
 - ix. Warranties
 - c. Detailed operation and maintenance, troubleshooting and lubrication instructions for each component of the equipment including repair, adjustments and assembly.
 2. A complete shop drawing submittal for lift station control and electrical systems shall be furnished for review. The submittal shall include, as a minimum, the following items listed below. See Division 16 specification sections for additional requirements.
 - a. A detailed component list including manufacturer, supplier, local source of service, supply of parts and catalog numbers.
 - b. Product data on components with sufficient detail to evaluate compliance with these specifications.
 - c. A custom wiring diagram for this specific application to facility and insure accurate field connections to the control panel by electrical installation personnel.
 - d. A description of operation for the control system.
 - e. An enclosure dimension print secured to the inside of the enclosure.

3. A complete shop drawing submittal for the structure and appurtenances shall be furnished for review. The submittal shall include, as a minimum, the following:
 - a. Names of manufacturers, supplier.
 - b. Complete information.
 - i. Structural dimensional drawing with design criteria
 - ii. Hatches and ladders
 - iii. Pipe, fittings and valves product information
 - iv. Paint systems
4. Preliminary Operation and Maintenance Manuals shall be submitted prior to shipment of the equipment. After review by Engineer, final approved copies of the Operation and Maintenance Manuals shall be delivered to Engineer not later than 30 days prior to placing the equipment in operation. Three copies of the preliminary and final manuals are required.

PART 2 - PRODUCTS

2.1 LIFT STATION WET WELL AND VALVE VAULT

- A. Lift Station Wet Well & Valve Vault Structures shall be of the dimensions as indicated on the plans, and shall be a precast reinforced concrete structure (ASTM C-478 & C-858, 4000 psi strength) with watertight joints as specified in Article 507 of the City Standard Specifications. Wet well interior surface shall be bituminous coated.
- B. The structure shall have holes provided for the gravity sewer and force main connections at the elevations indicated on the plans.
 1. Flexible seals shall be provided for gravity sewer inlet connections, as manufactured by Kor-N-Seal or equal. Rubber components per ASTM C-923, stainless steel banding.
 2. Piping connections, other than gravity sewer piping, shall be sealed with compression-type fittings, as manufactured by Link-Seal or equal.
- C. Aluminum Access Hatches shall be, sized as shown on the plans, as manufactured by USEMCO, BILCO, ITTFLYGT or approved equal. The aluminum frame shall be of 0.25" thick extruded aluminum having a continuous concrete anchor as a part of the one piece extrusion and exterior bituminous coating. Frames shall drain into the structure below through a coupling and pipe cast into the concrete cover. The access covers shall be of 0.25" aluminum diamond plate reinforced with aluminum stiffeners as required and shall be built to withstand a live load of 300 pounds per square foot. The cover shall have stainless steel or heavy forged brass hinges and be equipped with lift assist compressor springs, recessed lifting handles, and a padlock lock post or lock with removable "T" handle. The cover

shall open to 90 degrees and lock automatically in that position by a positive locking arm with release handle and stainless steel hardware.

1. Provide hardware as recommended by pump manufacturer for attaching guide rails to wet well cover. Door shall not conflict with pump removal using guide rails.
2. Provide wet well access hatch with 0.040 aluminum warning sign with baked enamel finish suitable for outdoor use. Sign shall be 10 inches by 14 inches minimum size with minimum 1-inch high black letters on yellow background, Sign shall read:

**CAUTION – DANGEROUS/HAZARDOUS GASES
LEVEL 2 CONFINED SPACE
DO NOT ENTER WITH OUT PROPER EQUIPMENT
AND SUPERVISION**

D. Valve Vault Access Ladder

1. Fabricate ladder of aluminum (ASTM B 221, alloy 6063-T6) to dimensions shown on the Plans. Comply with all applicable OSHA standards (Standard 1917.118 – Fixed Ladders, etc.), ANSI A14.3 and all other local, state and federal regulations.
2. Siderails: Continuous, 1/2-by-2-1/2-inch aluminum flat bars, with eased edges, spaced 18 inches apart.
3. Bar Rungs: 3/4-inch minimum diameter aluminum bars, spaced 12 inches o.c. Fit rungs in centerline of side rails; plug-weld and grind smooth on outer rail faces. Each rung must support a load of at least 250 lbs. applied in the middle of the rung.
4. Support each ladder at top and bottom and not more than 60 inches o.c. with welded or bolted aluminum brackets. Size brackets to support design loads specified in OSHA Standard 1917.118 and ANSI A14.3. The support brackets shall be a length such that minimum distance between the rung center line and the nearest permanent object behind the rung is 7 inches.
5. Provide corrugated, knurled, or dimpled rungs or provide non-slip surfaces on top of each rung by coating with abrasive material metallicly bonded to rung.
 - a. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - i. Mebac; IKG Borden.
 - ii. SLIP-NOT; W. S. Molnar Company.
6. Safety Post
 - a. Furnish & install below hatch cover, LadderUP safety post Model LU-4 as manufactured by The Bilco Company or approved equal. Device shall be aluminum with mill finish. It shall be designed with telescoping tubular section that locks automatically when fully extended. Upward and downward movement shall be controlled by a stainless steel spring balancing mechanism. Unit shall be

completely assembled with fasteners for securing to the ladder rungs in accordance with the manufacturer's instructions.

2.2 SUBMERSIBLE PUMPS

A. GENERAL/ OPERATING REQUIREMENTS

1. Each pump shall be a sealed, submersible, explosion-proof, non-clog, solids handling, centrifugal sewage pump. Each pump shall produce a minimum of 650 GPM at 159 feet TDH (total dynamic head) with 65% minimum efficiency and an operating speed of 1780 RPM. The pumps shall be provided with a 60 HP motor, suitable for 480 volt; 3 phase, 60 hertz electrical service. Motor shall be non-overloading over the entire operating range of the pump without employing the service factor. Each pump unit shall be approved for Class I, Division I, Group C and D Hazardous locations as defined by the National Electric Code (NEC). Acceptable manufactures include Fairbanks Morse, Hydromatic, ITT Flygt or approved equal. The estimated system curve at which the pumps must operate against is shown below:

Q (gpm)	TDH (ft)
0	133.5
550	151.7
600	155.0
650*	159.0
700	162.2
750	166.2

* Desired operating flow rate.

2. The pumps shall meet the requirements of NR 110.14, Wisconsin Administrative code. All pumps openings and passages shall be large enough to permit passage of a 3-inch diameter sphere and any trash or stringing materials without clogging the pump.

B. CONSTRUCTION

1. The pump volute, motor and seal housing, and sliding brackets shall be high quality gray cast iron, ASTM A-48, Class 30 or 35B. The pump discharge shall be fitted with a 4-inch standard ANSI 125 lb. flange, faced and drilled.
2. All external mating parts shall be machined and Buna-N, Nitrile or Viton Rubber O-ring sealed on a beveled edge.
3. All fasteners exposed to the pumped liquids shall be 300 series stainless steel.
4. All metal surfaces other than stainless steel, in contact with sewage shall be protected by an enamel or acrylic coating resistant to sewage.

C. IMPELLER

1. Impeller shall be ASTM A-48, Class 30 or 35B gray cast iron, of the two-vane enclosed non-clogging design and be of a radial flow design with well-rounded leading vanes and then tapered toward the trailing edge for a circular flow pattern to prevent the accumulation of solids and stringy material. It shall be capable of passing a 3-inch diameter solid. The impeller shall be threaded or keyed to the shaft. A 300 series stainless steel washer and impeller bolt shall be used to fasten the impeller to the shaft. The arrangement shall be such that the impeller cannot be loosened from torque in either forward or reverse rotation. Wiper vanes on the back impeller shroud are not allowed.
2. Impeller shall not require a coating to meet performance requirements. Efficiency and performance data submitted shall be based on performance with an uncoated impeller.
3. The impeller may be factory trimmed to meet the specific required performance conditions. Impeller shall be statically and dynamically balanced at the factory. The tolerance values shall be as listed in the table below according to the International Standard Organization grade 6.3 for rotors in rigid frames. The tolerance is to be split equally between the two balance planes, which are the two impeller shrouds.

BALANCE TOLERANCES	
RPM	TOLERANCE
1750	.02 in. - oz./lb. of impeller weight
1150	.026 in. - oz./lb. of impeller weight

D. CASING

1. The casing shall be of the end suction volute type having sufficient strength and thickness to withstand all stress and strain from service at full operating pressure and load. The volute shall have an integral tapered suction inlet area to direct flow to the impeller eye. The casing shall be of the centerline flanged discharge type. Volute discharge shall be minimum 4" diameter as measured on the inside diameter of the discharge flange opening. The design shall be such that the pumps will be automatically connected to the discharge piping when lowered into position with the guide rails. The casing shall be accurately machined and bored for register fits with the suction and casing covers.
2. Wear Rings
 - a. Wear rings shall be provided on both the impeller and fronthead so that clearances can be maintained throughout the life of the rings and minimize recirculation.
 - b. Impeller wear rings shall be of the axial- or face-type.
 - c. Fronthead wear rings shall be of the axial- or face-type.

- d. Wear rings shall be attached to the impeller and fronthead using an interference fit and Loctite.
- e. Wear rings shall be stainless steel, with the impeller wear ring approximately 50 Brinell softer than the fronthead wear ring.
- f. Wear ring clearance adjustment shall be attained through impeller adjustment shims.
- g. The wear rings shall be easily replaceable in the field.

E. COOLING SYSTEM

- 1. Motors shall have cooling characteristics which allow continuous operation in fully or partially submerged conditions without the motor reaching a temperature that would cause overheating, or premature insulation failure or any other damage. The cooling system shall provide for continuous pump operation in liquid or ambient temperatures of up to 104°F. (40°C.). Operational restrictions at temperatures below 104°F are not acceptable. Fans, blowers or auxiliary cooling systems that are mounted external to the pump motor are not acceptable.

F. GUIDE BRACKET and DISCHARGE CONNECTION FLANGE

- 1. A sliding bracket assembly shall be a part of the pumping unit constructed so that when lowered to the discharge base/elbow, the knifing action of the vertical seal provides a self-cleaning, non-clogging, non-sparking UL listed explosion-proof assembly. The discharge connection flange may utilize a replaceable rubber seat or metal-to-metal seat.
- 2. The volute casing shall have a cast iron machined discharge flange to automatically and firmly connect with the cast iron base elbow discharge connection, which when bolted to the floor of the wet well and discharge line, will receive the pump discharge connecting flange without the need of adjustment, fasteners, clamps or similar devices.
- 3. Installation of pump unit to the discharge connection shall be the result of a simple linear downward motion the pump unit guided by not less than two stainless steel guide bars.
- 4. No other motion of the pump unit, such as tilting or rotating, shall be required. No portion of the pump unit shall bear directly on the floor of the wet well. There shall be no more than one 90° bend allowed between the volute discharge flange and discharge piping.
- 5. Discharge elbow connection shall be a 4" diameter at the pump flange and 4" diameter at the piping connection.

G. MOTOR

- 1. Pump motor shall be of explosion-proof construction, F.M. approved and U.L. listed for operation in a Class I, Division 1, Group C and D environment.

2. The electrical power cable entry water seal design shall be such that precludes specific torque requirements to insure a watertight and submersible seal. Cable leads are to enter at the top of the motor, and are to allow the cable-to-motor connection to be accomplished in the field without soldering. All power and control lead wires are to be double sealed as it enters the motor in such a manner that cable-wicking will not occur. The sealing system shall consist of a rubber grommet followed by epoxy that is high in adhesive qualities and has a low coefficient of expansion, or shall consist of dual cylindrical elastomer grommets, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter. Where the sealing system consists of a rubber grommet followed by epoxy, each cable wire is to have a small section of insulation removed to establish a window area of bare wire and each wire is to be untwisted and surrounded by epoxy potting material. A cable strain relief mechanism shall be an integral part of this sealing system. Cable sealing system shall be capable of withstanding an external pressure test of 1200 PSI as well as a cable assembly pull test as required by Underwriters Laboratories. Singular grommet or other similar sealing systems are not acceptable.
3. If a cord cap assembly is used, it shall be sealed with a Buna N Rubber O-ring where it is bolted to the connection box assembly. The connection box assembly shall be sealed with a Buna N Rubber O-ring where bolted to the motor housing.
4. The motor stator, rotor and bearings shall be mounted in a sealed, submersible, oil or air filled, NEMA B design (3-phase) or NEMA L design (1-phase), type housing. The stator windings shall have Class F insulation (155 degree C.). The motor shall have a minimum 1.15 service factor and capable of sustaining 10 starts per hour. The pump and motor shall be specifically designed so that they may be operated partially dry or completely submerged in the liquid being pumped under continuous duty.
5. Motors shall be equipped with thermal switches. The thermal switches (one on single phase, three on three phase) shall be a low resistance, bi-metal disc that is temperature sensitive. The switches shall be mounted directly in the stator and sized to open at 120-130 degree C. and automatically reset at 30-35 degree C. differential. The switch shall be connected in series with the motor starter coil so that the pump ceases operation when an over-temperature condition is sensed. The starter shall be equipped with 3 leg overload relay with heaters sized for the pump's full load amps. The pump shall cease operation when the overload is tripped. The overload shall be manually reset.

G. BEARINGS & SHAFT

1. An upper radial bearing and a lower thrust bearing shall be required in the motor. These bearings shall be heavy-duty single row or double row ball bearings which are permanently lubricated with a B-10 bearing life of 40,000 hours.
2. The pump/motor shaft shall be machined from solid 416 stainless steel and be a design which is of large diameter with minimum overhang to reduce

shaft deflection and prolong bearing life.

H. SEALS

1. The rotor and stator in the motor housing shall be separated and protected from the pumped liquid by an air or oil-filled seal housing incorporating two tungsten-carbide mechanical seals mounted in tandem. Seals shall be tungsten-carbide only, no exceptions. The lower seal shall be replaceable without disassembly of the seal chamber and without the use of special tools.
2. The seal housing shall be equipped with a moisture sensing probe installed between the seals, or a float switch installed in the air filled motor. The sensing of moisture in the seal chamber, or motor, shall be automatic, continuous, and not require the pump be stopped or removed from the wet well.

I. ELECTRICAL POWER CABLE

1. Pump motor cable installed shall be suitable for submersible pump applications and this shall be indicated by a code or legend permanently embossed on the cable. Cable size shall conform to NEC and ICEA standards and shall be adequate size to allow motor voltage conversion without replacing the cable. Cables shall be water-resistant 600V, 60 degree C. minimum, UL and CSA approved and sized for amp draw of motor, NEC rated "SO" or "STO" or better.
2. Cable shall be of sufficient length to provide continuous run from in-place pump to point of cable connection. Provide minimum 40 feet of cable for each pump or more as necessary. Manufacturer shall supply continuous cable to pump control panel.

J. FACTORY TESTING

1. The pump manufacturer shall perform the following inspections and tests on each pump before shipment from factory.
 - a. Impeller, motor rating and electrical connections shall first be checked for compliance to the customer's purchase order.
 - b. A motor and cable insulation test for moisture content or insulation defects.
 - c. Prior to submergence, the pump shall be run dry to establish correct rotation and mechanical integrity.
 - d. Discharge piping shall be attached; the pump submerged under 6 feet minimum of water and amp readings shall be taken in each leg to check for an imbalanced stator winding. If there is a significant difference in readings, the stator windings shall be checked with a bridge to determine if an unbalanced resistance exists. If so, the stator shall be replaced. The pump shall run a minimum of 30 minutes submerged.

- e. After operational test No. iv, the insulation test (No. ii) is to be performed again.
2. A certified test report stating the foregoing has been completed shall be supplied with each pump at the time of shipment.
 3. The pump cable end will then be fitted with a shrink fit rubber boot to protect it prior to electrical installation.
 4. A hydrostatic test shall also be performed on the pump. The hydrostatic test shall require that the volute and impeller be removed and a fixture installed to hold the spring and lower mechanical seal in place. A double plate, gasket and through-bolt shall be installed on the pump. A discharge mating flange, gasket and pressure fitting shall be installed. The inlet port, volute and discharge nozzle shall then be pressurized with water to 150 percent of the maximum pump shut off pressure. This hydrostatic pressure shall be maintained for at least 5 minutes and the housing checked for leaks and/or loss of pressure.
 5. A non-witnessed Hydraulic Institute performance test shall be performed. This shall include the following:
 - a. The pump shall be tested at the design point as well as at least 4 other points to develop a curve. Data shall be collected to plot the head capacity curve as well as a KW input and amperage curve.
 - b. In making these tests, no minus tolerance or margin shall be allowed with respect to capacity, total head or efficiency at the specified design condition. Pump shall be held within a tolerance of 10% of rated capacity or at rated capacity with a tolerance of 5% of rated head. The pump shall be tested at shutoff, but not be plotted, and only used as a reference point when plotting the performance curve.
 - c. Complete records shall be kept of all information relevant to the test, as well as the manufacturer's serial number, type and size of pump, as well as any impeller modifications made to meet the design conditions.
 - d. A written test report shall be prepared, signed and dated by the test engineer incorporating 3 curves (head-capacity, KW input, and amperage) along with the pump serial number, test number, date, speed, volts, phase, impeller diameter, and certification number. This report shall then be submitted to the Engineer.

2.3 PUMP REMOVAL SYSTEM

- A. A pump removal system shall be provided to permit installation and removal of the pumps without the need for personnel to enter the wet well. A cast iron discharge elbow located on the floor of the wet well shall receive each pump when lowered into the operating position. Stainless steel lifting chain or cable is

not required.

- B. Each unit shall be furnished with complete stainless steel guide bars for pump installation and removal. Guide system shall include the following:
1. A ductile iron or stainless steel upper guide bracket: The upper guide bracket shall align and support the two guide rails at the top of the wet-well. It shall bolt directly to the hatch frame and incorporate an expandable rubber grommet for secure rail installation.
 2. Stainless steel intermediate guide brackets.
 3. Lower guide bar holders shall be an integral part of the discharge elbow.
 4. Guide bars shall be 316 stainless steel pipe of a diameter and wall thickness as recommended by the pump manufacturer.
 5. Guide system shall be constructed of non-sparking materials.
 6. All connecting hardware (i.e. bolts, lifting chain, etc.) shall be stainless steel.
 7. Guide bars shall extend from access hatch to the discharge elbow
 8. The discharge elbow designed to mount directly to the sump floor shall be supplied for each pump. It shall have a standard 125-pound flange faced and drilled on the outlet side, with a machined mating inlet connection. The design shall be such that the pump to discharge connection is made without the need for any nuts or bolts. The base elbow shall also anchor and align the two, guide rails.
 9. Lifting chain or cable: Not required.

2.4 CABLE HOLDER BRACKET

- A. An electrical cable holding bracket shall be provided with Kellum-type cord grip strain relief devices that supports and holds the pump cables and level control cables. Continuous cables are to run from pump(s) and level controls to the control panel. No splices shall be made in the wiring. The bracket shall be fabricated from stainless steel. The bracket shall be attached to the access frame with 300 series stainless steel fasteners. A dielectric spacer should be installed when bolting to an aluminum access frame.

2.5 PIPING

- A. **Buried ductile iron pipe** shall be Class 53, conforming to the latest revision of AWWA Standard C151 (ANSI A21.51), cement mortar, seal coated lined per AWWA Standard C104 (ANSI A21.4) with external bituminous coating, and push-on joints or mechanical joints with rubber gaskets conforming to the latest revision of AWWA Standard C111 (ANSI A21.11).
- B. **Exposed ductile iron pipe** shall be Class 53, conforming to the latest revision of AWWA Standard C115 (ANSI A21.15), cement mortar, seal coated, lined per

AWWA Standard C104 (ANSI A21.4) with an exterior shop prime coating. Flanges shall be ANSI B16.1-Class 125# rated at 250 psi maximum pressure with full-face rubber gaskets, or Flange-Tyte gaskets as manufactured by U.S. Pipe, conforming to the latest revision of AWWA Standard C111 (ANSI A21.11). Flange bolts shall be stainless steel with hex head and stainless steel hex nuts for the rated working pressures of the pipes and fittings.

- C. All fittings shall be cast or ductile iron meeting the requirements of the latest revision of AWWA Standard C110 (ANSI A21.10) or C153 (ANSI A21.53) for compact fittings, with conductive Class 250 mechanical joints with rubber gaskets for buried fittings and ANSI B16.1-Class 125# flanged joints with minimum 1/8" thick full face rubber gaskets for exposed fittings. Rubber gaskets shall conform to the latest revision of AWWA Standard C111 (ANSI A21.11). Flange bolts shall be stainless steel with hex head and stainless steel hex nuts for the rated working pressures of the pipes and fittings. Buried fittings shall have an external bituminous coating, while exposed fittings shall receive an external shop prime coating. All fittings shall be cement mortar seal coated lined per AWWA Standard C104 (ANSI A21.4). All fittings shall be manufactured in the United States of American only.
- D. All pipe openings through precast concrete sections shall be sealed with compression seals such as "Thunderline Link-Seals" by PSI or equal. All clamps, bolts, etc. shall be stainless steel and the bolt heads shall be placed on the inside of sewer access structures. Gravity sewer pipe openings may be sealed by flexible connectors.
- E. Pump guide rail piping shall be 316 stainless steel pipe with diameter and thickness per pump manufacturer.
- F. Pipe sleeve couplings shall be steel or cast iron, Rockwell 411/413, Dresser 38, or approved equal.
- G. Pipe supports not supplied by lift station manufacturer shall be stainless steel adjustable pipe saddle supports as manufactured by Cooper B-Line or approved equal. All hardware shall be stainless steel.
- H. Pipe flange adapters shall include ductile iron ASTM A536 flange with ANSI/AWWA A21.10/C110 (125#/Class 150) flange bolt circle, Buna gasket and 304 stainless steel anchor studs, bolts and nuts. Flange adaptors shall be EBAA Iron's MEGAFLANGE Series 2100 or Smith Blair's Model 912 (with anchor studs or tie rods).

2.6 VALVES

- A. Check Valves.
 - 1. Check valves shall be flanged cast iron (ASTM A126-B) body conforming to latest revision of AWWA Standard C508. Valve manufacture shall confirm proper operation of the valve specifically for the hydraulic conditions that the valve will operate under at this lift station. The valve shall provide non-slam closing characteristics.
 - 2. Working pressures of the check valves shall be 175 psig for diameters 2-12 inches, and 150 psig for diameters 16-24 inches.

3. Provide Swing-Flex Series 500, ASTM A536 Grade 65-45-12, Class B ductile iron body and cover, molded Buna-N (NBR) ASTM D2000-BG disc, flanges per ANSI B16.1, Class 125, interior and exterior coated with fusion bonded epoxy, manual operator, mechanical disc position indicator and backflow actuator as manufactured by Val-Matic Valve and Manufacturing Corp.

B. Eccentric Plug Valves.

1. Eccentric plug valves shall be furnished for buried or submerged service, 175 psi working pressure with mechanical joint ends where buried and with flanged ends where exposed, cast iron body (ASTM A126, Class B), corrosion resistant bearings, nickel or stainless steel seat, NBR packing, resilient faced (CR or NDB) plug (cast iron ASTM A126 Class B) for drip-tight shutoff, opening to the left (counterclockwise) with a by-directional worm gear actuator operating against a shut-off pressure of from 0 to 75 psi for 12 inch diameter and smaller and 150 psi for 14 inch diameter and larger. The exterior of the valve shall be coated with a universal alkyd primer.
 - a. Eccentric plug valves shall be Series 100 as manufactured by DeZurik; Cam-centric Series 5800R (flanged) or Series 5900R (mechanical joint) as manufactured by Val-Matic Valve & Mfg. Corporation, or approved equal.
2. Provide gear actuators with 2" operating nuts with wrench handles for plug valves in the valve vault. Size gear operators such that maximum handwheel rim pull required does not exceed 80 ft.-lbs. at a maximum pressure drop across the valve of 75 psi. Enclose gearing in a semi-steel housing and suitable for running in a lubricant with seals provided on shafts to prevent entry of dirt and water into the actuator. Support actuator shaft and quadrant on permanently lubricated bronze bearings. Indicate valve position and provide an adjustable stop to set closing torque for actuator. Provide 2" square operating nut, extension stem, valve box and cover for buried valves.

2.7 PRESSURE GAUGE ASSEMBLIES

1. Pressure gauges shall be industrial severe service grade with round 304 stainless steel, glycerin filled, 100 mm diameter case. Gauges shall have phosphor bronze copper alloy Bourdon tubes, brass sector and pinion movement, 1/4" NPT bottom mounted male threaded connections, poly carbonate window, and shall have an ASME Grade A accuracy of 2 1/2% (+/- 1% of range across middle half of scale). Pressure gauge scale range shall be from 0 to 100 psi. Pressure gauges shall be model X32507P as manufactured by Marsh Instruments or equal.
2. Pressure gauges shall be installed with diaphragm seals. Diaphragm seals shall be constructed of 316 stainless steel cases rated up to 2,500 psi with 1/4" NPT upper gauge connection, 1/2" NPT lower process connection, fluorocarbon diaphragm and glycerin fill. The seal shall be constructed such that the removal of the process side housing without losing the instrument side fill fluid is possible. Diaphragm seals shall be model 12000222442G as manufactured by Marsh/BelloFram or equal.

3. Pressure gauge assemblies shall be complete with pressure gauge, diaphragm seal, brass fittings and brass shutoff valves.

2.8 BUMPER POSTS

- A. Provide bumper posts as shown on Plans to protect lift station.
- B. Removable steel bumper posts shall have a nominal outside diameter of 5.563" and approximate wall thickness of 0.258". Steel bumper post sleeves shall have an inside diameter of 6.065".
- C. Lifting eye and anchor shall be a minimum of 5/8" diameter stainless steel capable of withstanding a 900-lb. load in tension. Lifting eye shall have a minimum clear opening size of 1-1/2" to allow for connection with lifting hook.
- D. Paint bumper posts with approved painting system. Engineer shall approve paint color prior to painting.

2.9 PAINTING

- A. All exposed metal piping, exposed fittings, all valves and the bumper posts shall be painted. However, do not paint stainless steel surfaces, code-required labels, or equipment name, identification, performance rating, or nomenclature plates.
- B. Painting of all exposed piping, valves and fittings shall be completed prior to start-up and performance testing of the lift station.
- C. Submit product data for paint system. Product data shall include, but not be limited to, manufacturer's information on products intended use, application procedures, and material properties.
- D. Paint System: The following system is based on Tnemec brand products. Contractor may use alternate brands only if approved by the Engineer.
 1. Shop Surface Preparation: Abrasive Blast clean in accordance with SSPC-SP10 Near-White Blast Cleaning standards. Apply primer before any rust bloom appears.
 2. Shop Prime Coat: Apply one even coat of Tnemec Series N69-Color at 3.0 to 5.0 mils DFT.
 3. Field Touch-up: Spot blast in accordance with SSPC-SP10 Near-White Blast Cleaning standards. Apply one coat of Tnemec Series N69-Color at 3.0 to 5.0 mils DFT.
 4. Intermediate Coat: Apply one even coat of Tnemec Series N69-Color at 4.0 to 6.0 mils DFT.
 5. Finish Coat: Apply one even coat of Tnemec Series N69-Color at 4.0 to 6.0 mils DFT.

PART 3 - EXECUTION

3.1 EXCAVATION

Excavation shall proceed with all precautions necessary to protect existing structures, utilities, roads, pavement, etc. The water table in the excavated pit and trench shall be kept below the level of excavation at all times to preclude "quick" conditions and to minimize caving and undermining. Sheet piling or other methods shall be used if required to control the width of the excavation and to protect streets, utilities, structures, etc. The bottom of the excavation shall be firm and free of water while the basin is being constructed and during backfill operations. The Contractor shall haul away and dispose of all excess excavated material.

3.2 BACKFILL

Backfill shall be carefully placed so as not to disturb structures or utilities. It shall be consolidated by jetting, mechanical compaction or other suitable methods to obtain a minimum of 95% of standard proctor density. Fill under sewer inlet and discharge force mains shall be thoroughly compacted to prevent settlement of pipes. In general, each lift shall not exceed 12". Backfill shall conform to the requirements of Section 502.1 (e) of the City of Madison Standard Specifications for Public Works Construction.

3.3 INSTALLATION CERTIFICATION AND START-UP

- A. Prior to acceptance, all station components shall be inspected for quality and tested for proper function and freedom from defects. Any deficiencies or irregularities shall be corrected. Automatic level controls shall be set to levels indicated on the plans.
- B. Certification: A qualified representative of the manufacturer of each item of equipment shall visit the job site and inspect, check, adjust if necessary and approve the equipment installation. The representative shall notify the Engineer in writing as to the correctness of the installation.

A qualified representative of the check valve manufacturer shall verify proper settings specifically for the hydraulic conditions that the valve will operate under at this lift station.

- C. Start-up: A qualified and properly equipped representative of the equipment manufacturer shall supervise the start-up, make all necessary adjustments, perform initial programming, and run preliminary tests.
- D. Performance Tests: After installation certification, the equipment shall be given a running test in the presence of the Engineer as described below. The Contractor shall furnish and install all gauges, meters and accessories required for this test and shall run each pump as directed by the Engineer.
 - 1. Each pump will be subjected to an operational test before acceptance as follows:
 - a. Preparation: The unit under test shall be properly installed in the wet well, firmly upon its discharge connection after determination (a) proper service voltage is being supplied, and (b) proper

rotation of the impeller.

- b. Operate each pump through a minimum of two pump cycles. Pump output shall be verified by timing of well level change. Contractor shall record readings on discharge pressure gauges, record MEG readings on each pump motor and amp readings in each leg for each pump to check for motor imbalance and excessive amp draw by the motor during pump testing. Automatic level control and pump alternation function shall be verified.
2. Telemetry system operation shall be verified.
3. Alarm system operation shall be verified.
4. The transfer switch and emergency generator receptacle shall be tested by disconnecting the utility power source at the main breaker, and running the station by the portable generator.
5. Contractor shall demonstrate proper installation of the Pump Removal System in the presence of the Engineer. Each pump shall be lifted completely out of the wet well and reinstalled utilizing the Pump Removal System shown on the Plans and specified herein. Contractor shall provide all equipment required to remove and reinstall the pumps.
6. Any leakage from piping, pumps, valves or any other equipment will not be accepted. The Contractor shall locate and repair any defects causing the leakage at his own expense.
7. The Contractor shall be responsible to repair defects and/or failure of equipment to meet the requirements of these specifications completely at his own expense.

3.4 GUARANTEE

- A. The equipment manufacturers shall guarantee for a period of one year from the date station is placed into operation or eighteen months from date of shipment, whichever occurs first, that the station and all equipment therein shall be free from defects in design, materials and workmanship. In the event a component fails to perform as specified by Engineer, or as represented by the manufacture, or is proven defective during the guarantee period, the manufacturer will replace, repair, or satisfactorily modify the component without cost of parts, shipment, or labor to the Owner. Normal use items, such as grease, light bulbs, mechanical seals, packing and belts are excluded. Pumps shall be warranted for a period of 5 years, as stated in Part 2 of this specification section.

3.5 BASIS OF PAYMENT

- A. **Lift Station** will be paid for on a lump sum basis at the contract price. Price shall be payment in full for all excavation, dewatering, bedding, back filling, compaction, testing, startup, and furnishing all materials, fittings, tools, equipment, labor and incidentals necessary to complete the work in accordance with the Contract Documents. Electrical connection to utility and all valves and piping within the station shall be included in the lump sum price.

END OF SECTION 11306

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DIVISION 16. ELECTRICAL

Midtown Road Pumping Station, City of Madison



The following Specification Sections are included in this Division:

- 1601. Scope
- 1602. General Electrical Requirements
- 1603. Basic Materials and Methods
- 1606. Lighting Fixtures
- 1607. Electrical Service System
- 1608. Motor Controls
- 1612. Controls and Instrumentation
- 1615. Owner Furnished/Installed Equipment
- 1625. Drawings

1601. SCOPE

All work included in this division shall be coordinated with, and complementary to, all the requirements and conditions set forth in other divisions and sections of the specifications and associated drawings, wherever applicable to the electrical work. All applicable requirements of the General Conditions and Division 1 (if attached) shall apply to work under this Division.

Contractor is reminded to familiarize him/herself with all sections of the Contract Document including the General Conditions Section, the work of other trades, and the local conditions and rules prior to submitting his/her bid.

Reference Standards

Publications listed below refer to the latest editions of the following:

ANSI	American National Standards Institute
IEEE	Institute of Electrical and Electronics Engineers
NBS	National Bureau of Standards
NEC	National Electrical Code
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
U.L.	Underwriters Laboratories
IBEW	International Brotherhood of Electrical Workers
ETL	Electrical Testing Laboratories
FM	Factory Mutual
OSHA	Occupational Health and Safety Administration
DILHR	(Wisconsin) Department of Industry Labor and Human Relations
DNR	(Wisconsin) Department of Natural Resources

1602. GENERAL ELECTRICAL REQUIREMENTS

1602.1 Scope

The intent of drawings and specifications is to obtain a complete system; tested, adjusted and ready for operation. Work performed under this contract shall include all labor, materials, and equipment necessary to complete it. An exception is Owner installed equipment.

Incidental work or items that may not be shown or specified but are necessary for proper installation and operation shall be included. Work which the Owner will provide will be clearly shown and/or specified. All other work shall be provided by the Contractor.

Contractor shall check, verify, and coordinate his work with drawings and specifications prepared for other trades. All modifications, relocation or adjustments necessary to complete work or to avoid interference with other trades shall be included and is considered a routine part of this Contractor's work.

Included in this contract are electrical connections to equipment provided by others. Contractor shall refer to final shop drawings for equipment being furnished by others for exact location of electrical outlets and the various connections required.

Information given herein and on drawings is as exact as could be secured but is not guaranteed. Exact dimensions must be field verified (do not scale drawings for exact dimensions).

Where an "approved equal" clause is provided, it is intended that the equal material or equipment be approved in writing by the Engineer at least 5 days prior to the time of bidding. Any item not submitted 10 days prior to the bid will not be considered an "approved equal".

1602.2 Electrical Service

Utility connection requirements shall be determined. All costs to the Owner for the electrical service shall be included in the lump sum bid as described in Section 1607 of these specifications. All costs for temporary service, temporary routing of piping or any other requirements of a temporary nature associated with the electrical service shall be included.

1602.2.1 Temporary Wiring

Temporary wiring where installed shall meet all codes pertaining to temporary electrical wiring (NEC-Article 305). Changes shall be made without delay, if concerns of safety are expressed by the Engineer or the Local Electrical Inspector. This last requirement regarding the Engineer or Inspector does not alleviate the Contractor from bearing full responsibility for the safety and integrity of any temporary electrical wiring he installs.

1602.2.2 Use of Permanent Power

It is the intent that in the latter stages of construction, the permanent electrical services may be used at the discretion of the Engineer. The following requirements shall govern the use of the permanent services:

- a) Only permanently connected and protected circuits and outlets shall be available.
- b) Temporary wiring shall not be connected to permanent distribution equipment without approval of the Engineer.
- c) Under the above conditions, the use of permanent service equipment shall in no way affect the Contract conditions of the guarantee.
- d) The new electrical service may not be used to provide temporary building heat for the use of the Contractors.

It shall be the Contractor's responsibility to police this situation and protect his equipment. The Contractor assumes full responsibility for replacement of any of his equipment damaged during this period.

1602.3 Requirements of Regulatory Agencies

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.

1602.5 Approvals and Shop Drawings

The Contractor shall submit to the Engineer for approval shop drawings consisting of all products and materials required for this job.

The Contractor shall submit to the engineer for approval shop drawings consisting of outline and general arrangement drawings, data sheets, and wiring diagrams, for each of the following:

- Lighting and Distribution Panelboards
- Motor Starters and Related Items
- Control Panel and Instrumentation
- Conduit Routing
- Site Conduit for Main Service
- Main Service Equipment
- Telemetry Equipment

All shop drawings shall include proper identification by name and/or place of use. For materials and products, shop drawing shall show or detail compliance with specification.

Shop drawings shall be submitted showing electrical equipment layouts drawn to scale, including equipment, raceways, accessories and clearance for maintenance.

Shop drawings which are not complete will be returned without approval. The Engineer may request additional information to determine if what is proposed meets the specified criteria. The Contractor is responsible for providing the additional information to the Engineer in a timely fashion. Contractor takes full responsibility for equipment which is installed without approval. The Owner has every right to request replacement of equipment which does not meet the specifications. The Owner will bear no costs for replacement of such equipment.

Detailed conduit layouts shall be submitted for approval prior to starting any installation, showing both exposed, concealed and underground conduit locations. It is the intent that this will simplify installation and record drawings. Coordination of layout with other trades is essential.

1602.6 **Permits, Certificates, and Inspection**

The costs of required construction permits shall be included and paid for under this Contract. A photo-copy of the Construction Permit shall be delivered to the Owner.

A copy of the certificates approving the installation by the Local Electrical Inspector shall be delivered to the Owner.

The Electrical Contractor shall obtain and pay for all installation inspections.

1602.7 **Record Drawings**

Record Drawings "As-built" are required for the following:

- ◆ Utility Service Panelboard
- ◆ Station Control Panel
- ◆ Equipment layout showing conduit and wire interconnections
- ◆ Conduit layout of all affected areas including wires in each conduit and use
- ◆ "As Built" Control Schematics for all equipment and systems

Conduit and equipment layout is acceptable on marked up neatly modified CAD drawings. Equipment interior layouts and schematics should be photocopies of the original manufacturer's drawings showing actual wiring (generic wiring diagrams are not acceptable). Control system drawings and interconnections should be CAD. If done on CAD, copies of CAD drawings on CDs shall be forwarded to the Owner (proper CAD settings and adjustments shall also be forwarded to insure proper compatibility). The Owner demands a high degree of accuracy and neatness. Drawings not done in this manner will be returned marked "Not Approved".

1602.8 **Operating and Maintenance Manuals**

Included in a manual shall be instructions for all equipment supplied as a part of this project. Information should be provided for all components of the equipment, whether manufactured by the supplier or not. Detailed technical information should be provided including schematics to the component level. Technical information shall include but not be limited to instruction manuals for the Power System Panel, Motor Starters, the Station Control Panel, and all other equipment provided as part of this project. This information shall include technical manuals for subsystems provided as part of a package. At the Owner or Engineer's request additional information shall be provided.

The manual shall include the following and shall have an index of contents and tabs for each piece of equipment or system:

- * Manufacturer's operating and maintenance instructions and parts lists of all items of equipment. Where manufacture's data includes several types of models, the applicable type or model shall be designated.
- * Wiring diagrams for all systems.
- * Additional information, diagrams, or explanations as designated under the respective equipment or systems specification.

A schedule of all required preventive maintenance of equipment shall be included in the manual.

In addition to the paper copies required above, electronic copies of the O&M manuals are required in Adobe Acrobat pdf format. Four CD-ROM copies shall be provided. Files shall be provided with proper indexing to match table of contents in paper copy. A single review copy shall be submitted for review. Once approved, submit all four copies to OWNER.

The Contractor shall instruct the owner's representative in the operation and maintenance of all equipment. The instruction shall include a complete operating cycle on all apparatus.

1602.9 **Building / Site Access**

The Contractor shall arrange for the necessary openings in the building or site to allow for admittance of all apparatus.

When the installation requires openings and access through existing construction and the openings have not been provided by the General Contractor, the Electrical Contractor shall provide the necessary openings and repair at his cost.

1602.10 **Coordination**

The Contractor is reminded to coordinate his work with other trades. Where conflicts exist the Owner's Engineer shall have the final say.

Provide wiring for all motors and all electrically powered or electrically controlled equipment.

All starters, disconnects, relays, wire, conduit, pushbuttons, pilot lights and other devices required for the power and control of motors or electrical equipment shall be furnished by the Contractor, except as specifically noted elsewhere in these specifications.

Where starters or other devices are furnished by others, they shall be connected and wired by the Electrical Contractor.

The Electrical Contractor's drawings and specifications show number and horsepower rating of all motors furnished by others, together with their actuating devices. Should any change in size, horsepower rating or means of control be made to any motor or other electrical equipment after the contracts are awarded, the Contractor responsible for the change shall immediately notify the Electrical Contractor. Any additional costs due to these changes shall be the responsibility of the Contractor initiating the change.

All equipment and wiring shall be selected and installed for conditions in which it will be required to perform; e.g., general purpose, weatherproof, raintight, explosion proof, dust tight, or any other special type as required.

All motors shall be furnished by others for starting in accordance with local utility requirements and shall be compatible with starters as specified here or under the various trades' sections of these specifications.

The Contractor shall provide power wiring and control wiring, and connect all equipment complete and ready to operate.

The Contractor shall connect and wire all apparatus according to approved wiring diagrams furnished by the various trades.

In general, motors 1/2 HP and larger shall be NEMA rated 480 volts, three phase, 60 Hertz. Motors 1/3 HP and below shall be 120 volt, single phase, 60 Hertz, except as noted.

1602.11 **Testing**

The Electrical Contractor shall notify the Engineer and any inspectors required to observe the test when the test is ready to be performed.

All equipment required for testing, including meters, power sources and control panels shall be provided by the Contractor.

After the test has been approved, or portions thereof, the Contractor shall certify in writing the time, date, name and title of the person approving the test. This shall also include the description and what portion of the system has been approved. The person approving the test shall sign the certification.

A complete record shall be maintained of all testing that has been approved and shall be made available at the job site to all authorities concerned.

Upon completion of the work, all records and certifications approving testing requirements shall be submitted to the Engineer before final payment is made.

Defective work or material shall be replaced or repaired as necessary and the inspection and test repeated. Repairs shall be made with new materials. Tests for the various items of equipment shall be as specified in their respective specification sections.

1602.13 **Housekeeping and Cleanup**

Periodically, as work progresses and/or as directed by the Engineer, the Contractor shall remove waste materials from the building and leave his work area broom-clean. Upon completion of work, remove all tools, fencing, scaffolding, broken and waste materials, etc., from the site.

After project / installation has been completed, the Electrical Contractor shall clean all systems.

All control panels, switchboards, motor starters and disconnect switch enclosures, junction boxes and pullboxes shall be cleaned of debris, and wires neatly arranged prior to installation of covers.

Where louvers are provided in switchgear or transformer enclosures, louvers shall be vacuumed free of all dust and dirt.

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.

Equipment shall be thoroughly cleaned of all stains, dirt and dust. All temporary labels not used for instruction or operation shall be removed.

1602.14 **Guarantees**

Guarantee for one year, after acceptance by the Owner, all equipment, materials and workmanship to be free from defect.

Repair, replace or alter systems or parts of systems found defective at no extra cost to the Owner.

In any case where fulfilling the requirements of any guarantee, the Contractor disturbs any work guaranteed under another contract, he shall restore such disturbed work to a condition satisfactory to the Engineer and guarantee such restored work to the same extent as it was guaranteed under such other contract.

1603. BASIC MATERIALS AND METHODS

1603.1 Scope

This section of work includes the basic materials and methods required to install, connect, test and complete the electrical work in a finished manner.

1603.2 Materials

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.

Materials and equipment of the types for which there are National Board of Fire Underwriters' Laboratories (U.L.) listing and label service shall be so labeled and shall be used by the Contractor.

All materials used for the electrical installation shall be new and unused, except as otherwise indicated, and shall be uniform in type and manufacture for the entire electrical installation.

All materials shall be suitable for the conditions and duties imposed upon them in service and shall be the latest standard catalog products of reputable manufacturers.

For purposes of this project, the entire wetwell will be considered a Class I Division 1 area. The area will also be considered corrosive. All equipment installed in these areas shall meet the installation criteria for use in that type of environment.

1603.4 Painting

All painting of electrical equipment will be done by the Contractor unless equipment is specified to be furnished with factory applied finished coats.

All electrical equipment (*motor starters, station control centers, switchgear, dry type transformers etc.*) shall be factory finished with one coat dried enamel. Color shall be manufacturer's standard gray or as specified under the pertinent equipment division.

If the factory finish on any equipment furnished by the Contractor is damaged in shipment or during construction, the equipment shall be refinished by the Contractor to the satisfaction of the Engineer

1603.5 **Cutting and Patching**

Beams or columns shall not be pierced. If any openings are required through walls or floors where no sleeve has been provided, the hole for the sleeve shall be drilled to avoid all unnecessary damage and structural weakening.

Conduits or cables penetrating smoke or fire barriers must not destroy the barrier's integrity.

All cutting and patching required for complete installation of Electrical systems shall be by the Contractor unless specifically noted elsewhere. All new or existing equipment cut or damaged shall be patched and repaired to its original condition.

Coordinate the location of sleeves, openings, chases, furred spaces, etc., Provide during the progress of construction all sleeves, hangers and inserts that are to be built into the structure.

Provide sleeves for conduits and cables passing through masonry, concrete or other similar construction. Sleeves shall be of rigid conduit and shall extend completely through the construction.

Sleeves for conduit four inch and smaller shall be at least two sizes larger than the conduit passing through. Sleeves for conduit larger than four inches shall be at least one size larger than conduit passing through. Sleeves in floors shall extend 1/2 inch above the finished floor.

Grout openings between sleeves and concrete or masonry walls and floors with sand-cement mortar consisting of one part Portland cement and three parts sand, by volume. Add sufficient water to make a stiff, placeable mortar.

Pack annular space between sleeves and conduits with fiberglass. Where penetrations occur through fire rated walls or floors, fill space with fire-resistive insulation.

Where alterations disturb lawns, paving, walks, etc., the surfaces shall be repaired, refinished and left in the condition existing prior to commencement of work.

1603.6 **Equipment Access**

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 required to provide maintenance access shall be accomplished by the Contractor at no additional cost.

Equipment shall be installed with ample space allowed for removal, repair or repairs 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.

The Engineer shall reserve the right to make minor position changes of the outlets before the work has been installed. Verify door swings before installing room lighting switch boxes, and install boxes on the latch side of door unless noted otherwise.

1603.7 **Equipment Supports**

Provide all supporting steel not indicated on the structural drawings as required for the installation of equipment and materials, including angles, channels, beams, hangers, etc. In the wetwell area supports shall be 316 stainless steel.

1603.8 **Equipment Anchors**

All electrical equipment mounted on or attached to concrete shall be firmly and adequately anchored to the concrete by stainless steel anchors. Anchors shall be installed as per manufacturer's recommendations. All associated hardware shall be stainless steel.

1603.9 **Identification**

The intent of this section to provide a system of identification for the Contractor to follow for equipment, wiring, and conduit. Proper identification is a must and will aid the Owner's Staff in future maintenance and troubleshooting. All identification and marking shall comply with the NEC, NFPA-70E, all requirements of OSHA and DILHR, and all other state and local requirements which may apply.

1603.9.1 **Equipment Identification**

After painting is completed, identify all equipment as indicated on the plans or as indicated under specific equipment divisions of the specification. Locate identification as conspicuously as possible except where such would detract from the finished area.

Engraved plastic nameplates shall be securely attached to junction box covers of the following:

Electrical Distribution System
Control System Terminal Boxes

Engraved plastic nameplates shall be securely attached to and include, but not necessarily be limited to the following:

Main Incoming Power Switchboard and Station control Center
Lighting Panels and Control Panels
Motor Starters, Disconnects, and Circuit Breakers
Each separately mounted circuit breaker or disconnect switch
Each device in or on Station Control Center, Switchboards or Control Panels
Each separately mounted control device, i.e. pushbutton stations

The nameplates shall be 1/2-inch high lettering, except where space is limited, letters may be 1/8-inch high as needed to give a neat appearance.

Face of nameplate is to be white and letters black, except emergency power equipment nameplates are to have red face with white letters.

Secure nameplates with 4-40 panhead stainless steel screws. Nameplates shall be installed in a neat and workmanlike manner to the satisfaction of the Engineer.

Nameplates shall identify the equipment or load controlled and/or the function and shall be the same as indicated on the contract documents. Voltages are to be shown on panelboard nameplates.

Submit identification to the Engineer for approval. The Engineer reserves the right to modify identifications prior to shop drawing approval.

1603.9.2 Wire Identification

Conductors in pull boxes, cabinets and panelboards shall be grouped as to circuits and arranged in a neat and workmanlike manner with crosses kept to a minimum. 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.

Wiring for each piece of equipment in a control panel or motor control center shall be neatly installed, grouped by equipment, and wire wrapped with Panduit Spiral Wrap or equal from where it leaves the raceway system until it enters plastic wiring ducts or terminates at the motor starter bucket. The intent is to protect the wire, allow quick and easy wire and system identification, and keep the appearance neat and organized.

Identify each conductor of all systems at each panel, pull box, and at each outlet with permanently attached computerized adhesive tags. Use Brady IDXPRT Labeling Printer with Self-Laminating Vinyl, PermaSleeve Heat-Shrink Polyolefin or approved equal. NO permanent hand written labels will be allowed.

Identification shall include: circuit number, phase, control circuit number or other appropriate number or letter that will expedite future tracing and troubleshooting. Identification shall match wire schedules and shop drawings.

In addition to the above requirements the wire and/or cables shall meet the following color code:

System Voltage ---	480/277 V	208/120 V
Phase A	Brown	Black
Phase B	Orange	Red
Phase C	Yellow	Blue
Neutral (if used)	Gray	White with phase tracer
Ground	Green	Green

Foreign Voltage Wiring within panels shall be YELLOW.

AC control wiring shall be RED.

DC control wiring shall be BLUE.

All intrinsically safe wiring shall be identified with permanently affixed labels with the wording "INTRINSIC SAFETY WIRING" and by using **light blue** wire. Where practical insulation color should follow this color code. Where not practical (i.e. larger wire sizes) wire should be marked with the appropriate colored tape.

1603.10 **Raceway Systems**

1603.10.1 **Rigid Steel Conduit**

Rigid steel conduit: Heavy wall seamless tubing with hot dipped galvanized coating. All rigid conduit including elbows, bends and couplings shall be in strict accordance with ANSI Specifications. Each length of conduit and all parts of the conduit system, regardless of type, shall bear a label indicating compliance with the requirements of the U.L., Inc. or other approved listing agency.

Rigid steel conduit shall be used for all raceways in this contract except where flexible connections are required or where PVC coated rigid steel conduit is specified. The minimum size of rigid steel conduit shall be 3/4 inch.

1603.10.2 **Liquid Tight Flexible Metal Conduit**

All flexible conduit used on this project shall be liquid tight flexible metal conduit.

Liquid tight flexible metal conduit: Electro-galvanized single strip steel with PVC coating, as manufactured by Anaconda type UA or LA, U.L. listed.

Liquid tight flexible conduit shall be used for final connections not over three (3) feet in long to:

- a) Equipment in wet or dry locations with sliding bases or flexible positioning;
- b) Equipment in wet or dry locations with vibration isolation mounting;
- c) Equipment in wet or dry locations housing ferromagnetic cores or with integral moving components capable of generating noise or vibrations, including transformers and motors;
- d) All pumps and associated equipment.

The minimum size of flexible conduit shall be 1/2 inch.

1603.10.3 PVC Coated Rigid Steel Conduit

PVC coated epoxy lined rigid steel conduit and fittings shall be Robroy or approved equal. Only PVC-coated rigid steel conduit will be allowed for use in Class I, Division 1 or 2 areas or areas with corrosive atmospheres. Areas with corrosive atmospheres will be so marked on the drawings.

All underground and outdoor conduits on this project shall be PVC coated rigid steel unless otherwise approved by the Engineer

Minimum size conduit for PVC coated rigid steel conduit shall be 3/4 inch.

1603.10.4 Conduit Fittings

All fittings where rigid steel conduit is used shall be galvanized steel or malleable iron. Aluminum fittings will not be allowed. Fittings for areas where PVC coated rigid steel is used shall be PVC coated rigid steel with an epoxy liner.

Conduit terminations shall be provided with double gasketed sealing lock nuts and grounding bushings or be terminated by the means of a threaded hub which has smooth rounded integral bushing to protect conductors. This includes, but is not limited to all conduits terminated at equipment such as junction boxes and motor control centers.

Set screw or indenture type fittings are not acceptable.

Conduit couplings and terminals shall be threaded. Set screw, split or gland type couplings are NOT acceptable for rigid conduit.

Conduit expansion fittings shall be as follows: Install O-Z Gedney type "EX" or "AX", Appleton, or equal, conduit expansion fittings, complete in all conduit runs which cross a structural expansion joint.

Install O-Z/Gedney type "DX", Appleton, or equal, conduit expansion-deflection fittings in all conduit runs where movement perpendicular to axis of conduit may be encountered.

Vertical conduit runs 1-1/4 inch and larger passing through floors shall be supported at each floor with conduit riser grips.

Conduit and boxes attached to building surfaces which may be damp shall be spaced out 1/4 inch to avoid rust and/or corrosion using fittings approved for the use.

Conduit seals shall be provided where conduits pass from the interior to exterior of the building, in moist areas in accordance with the NEC, where conduits enter a room which at any time is a low or high temperature room, and where conduits enter a room which at any time is subject to internal air pressures above or below normal.

All conduits entering or passing through areas which are "hazardous areas" as defined by the NEC and/or NFPA are to be sealed using Appleton Series EYF seal fittings and Apelco sealing compound or equal, following manufacturer's recommended installation methods.

All conduits located in hazardous areas are to be installed in accordance with Article 500 of the NEC.

Conductors in vertical raceways shall be supported using O-Z/Gedney type "S" or equal cable supports as required by the NEC.

Conduit bodies shall be Appleton Form 35 malleable iron, threaded type complete with steel cover and neoprene gasket or approved equal.

Liquid-tight flexible metal conduit connectors shall be the insulation type Appleton Catalog #STB- or approved equal.

All conduit unions to be three-piece concrete tight Appleton Catalog #EC or approved equal conduit unions.

Grounding bushings shall be threaded with insulated throat and solderless lugs, Appleton Catalog #GIB or approved equal.

Cable strain relief fitting shall be used at termination of flexible cords or cables to junction boxes by the use of a Hubbell/Kellems cord connector, stainless steel, Catalog #SHC-1030-SS or approved equal.

1603.10.5 Conduit Installation

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.

Run exposed conduit grouped and parallel or perpendicular to construction. Do not route exposed conduits over high temperature equipment, or in contact with such equipment. Provide standoffs from all walls, floors or ceilings for all conduits.

No conduit shall be installed in structural slabs without permission from the Engineer.

Ream conduit smooth at ends, rigidly attach to structural parts of the building and securely fasten to all outlet boxes, panel cabinets, junction boxes, pull boxes, splicing chambers, safety switches and all other components of the raceway system. All conduits shall be made up water-tight.

Independently support or attach the raceway system to structural parts of construction in accordance with good industry practice. Conduits through roofs shall be equipped with weatherproof pitch pockets provided by the Contractor. Contractor shall insure that penetrations and conduits are sealed properly and do not leak.

Conduits shall be securely fastened to building structure at intervals not exceeding eight feet or closer if required, with one hole stainless steel conduit hangers, Minerallac Catalog #1-S or equal. Where hangers are required, 3/8 inch stainless steel hardware shall support B-line Type-22 (or Type B-42 load permitting) galvanized channel. Rigid conduits shall then be anchored to channel by rigid conduit pipe clamps, B-line Part No. B2009 or approved equal.

ALL hardware for supporting conduits shall be stainless steel. **For construction purposes on this project, the entire wetwell will be considered a corrosive area.**

Field bends shall be carefully made so as to prevent conduit damage or reduction in the internal area. The inner radius shall be not less than six times the nominal diameter of the conduit with carefully matching bends on parallel runs so as to present a neat appearance. The number of crossovers shall be kept to a minimum. The total bends in power conduit between boxes shall not exceed three quarter bends or 270 degrees between pull boxes.

Except where noted, conduits shall be run exposed, parallel with building construction. Conduits for equipment on exterior of buildings shall be run concealed whenever possible.

Where conduits run concealed in slabs and bend up to come out of the slab, conduit base at floor level shall be protected by sloping floor away from conduit so that water will drain away from base of conduit. Coordination of this is the responsibility of the Contractor. Where this is not possible, another means of conduit protection approved by the Engineer shall be employed. PVC-coated rigid steel conduit shall be installed in strict accordance with the manufacturer's recommendations. PVC-coated rigid steel conduit shall be touched up with the touch-up coating available from the manufacturer. All 90 degree bends shall be manufactured elbows. The Electrical Contractor may bend PVC-coated rigid on site; however, his bending equipment shall be sized for the exterior PVC coating. The Electrical Contractor shall use large hole dyes for threading the conduit to allow for the PVC coating. Grounding bushings with proper grounding is required for all PVC-coated rigid steel conduit.

1603.10.6 Underground Raceway Systems

Conduits shall be PVC coated rigid steel conduit as specified in section 1603.

Conduits shall be direct buried with a minimum of six (6) inches of pea gravel surrounding the conduits, on the top, sides, and bottom. Base shall be compacted to the Engineer's satisfaction prior to setting conduits in trench. Cover pea gravel with a minimum of one (1) foot select sand and fill remainder to grade with top soil.

Install top of duct lines a minimum of 24 inches below finish grade and pitched for drainage (where possible). Install base and intermediate spacer at every coupling point of each conduit for a two-inch separation horizontally and vertically. **Notify engineer 24 hours in advance prior to backfill of any underground electrical work.**

1603.11 **Junction Boxes**

Provide all boxes which may be required to comply with code. Boxes shall be of NEMA type in accordance with area designation noted on drawings. All boxes shall be labeled with permanent labels (see identification in section 1603.9). Junction boxes are normally not shown on drawings, but shall be supplied where specifically shown and as necessary.

Junction or pull boxes and covers: Code gauge 316 Stainless Steel, covers secured by stainless steel machine screws. Boxes shall be large enough so that code required minimum cable bending radii can be rolled and constructed.

Provide 1/4 inch standoff for pull boxes and junction box and cabinets. In general all junction or pull boxes and covers below 100 cubic inches shall be cast metal. All junction boxes above 100 cubic inches shall be continuous hinge clamp cover NEMA 4X, 316 Stainless Steel.

Junction boxes shall be provided to meet the requirements of the area they are intended to be used in. Boxes installed in hazardous or corrosive areas as indicated on the drawings shall be PVC coated cast boxes or 316 stainless steel. Boxes installed in damp, wet or outdoor areas shall be NEMA 4X, 316 Stainless Steel or as specified in drawings.

Double gasketed sealing locknuts with grounding bushings shall be used on all conduit entries into junction boxes which do not have integral threaded hubs. Boxes with threaded hubs shall have smooth rounded integral bushings to protect conductors.

1603.12 **Wire and Cable**

All wire and/or cable for permanent installation shall be new copper, delivered to project in unopened cartons or reels. No wire smaller than AWG#12 shall be used except for control wiring or unless specifically noted. All wire shall be stranded; no solid wire shall be used. Minimum insulation rating shall be 600 volts.

All motor control wiring shall be AWG#14 stranded or as noted.

Control wiring for supervisory and control equipment will typically be as noted. Wiring shall be AWG#14 stranded between panels and field devices for discrete signals and two conductor signal wire AWG#18 with shield and overall jacket (see section 1603.12.2) for analog signals and communication signals. Special cables will be as noted.

Motor and branch circuit wiring, sizes AWG#14 and smaller shall be THWN or higher temperature rating insulation; AWG#12 and larger sizes shall be XHHW-2; All wire shall be stranded and wire of sizes AWG#10 and over shall be Class B stranded. Colors shall be as specified in section 1603.9.2. Where color coded wire in larger size is not available, one wrap of one-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.

15 and 20 amp branch circuit wiring in excess of 75 feet shall be minimum AWG#10. Circuits 150 feet or over must be sized for maximum two percent voltage drop.

Minimum field control wire size shall be AWG#14 unless otherwise noted or approved by Engineer. Control wiring in panels shall be AWG#16 TFFN stranded.

1603.12.1 Wire and Cable Installation

All wire on this project shall be installed in raceways, unless specifically noted otherwise.

No wire or cable shall be installed in any conduit until building is enclosed, watertight and dry. Before installing conductors in conduit all debris and water shall be removed. All conduits shall be swabbed out prior to installing conductors.

Conductors shall be installed in conduit system in such a manner that conductor insulation is not damaged and conductors are not overstressed in pulling. No splices are permitted except in junction or outlet boxes.

The Contractor shall observe code limitation on the number and size of wires in an outlet box. He shall either lay out his work so that the wires do not exceed the particular box limitation, or provide larger boxes, approved for additional capacity.

Conductor splices AWG#10 and smaller shall be made with insulated spring type connectors such as Scotchlock, Ideal, or equal. Splices for AWG#8 and larger shall be made with split bolt type connector and taped to full 600 volt insulation with Scotch #88+, or equal tape.

Panel feeder conductors shall be identified with colored tape at panel lugs. The same phase color relation shall be maintained throughout the system.

Install cable supports on all risers per code requirements.

All wires and cables shall be color coded and identified as per section 1603.9.2 using Brady IDXPRT Labeling Printer with Self-Laminating Vinyl, PermaSleeve Heat-Shrink Polyolefin or approved equal. NO permanent hand written labels will be allowed.

Conductors in pull boxes, cabinets, and panelboards shall be grouped as to circuits and arranged in a neat and organized manner. All conductors of a feeder or a branch circuit shall be grouped, bound together with nylon ties and identified. Wiring in motor control centers and control panels shall be protected by spiral (Panduit Spiral Wrap) wrapping wires in groups from the conduit system to plastic wireways or to the final terminations inside the motor control center or control panel.

A separate neutral conductor for each lighting panel circuit is required.
NEUTRALS FOR SEPARATE CIRCUITS ARE NOT TO BE COMBINED.

Ground conductors are required in all conduits and shall be bonded to raceways at every junction box or pull point. Raceways shall be grounded at each end with the use of grounding bushings where not attached to metallic enclosures.

A maximum of six non-grounded conductors may run together for feeds to motors. Motor power conductors may run together for two motors which are 3 HP or less provided; motors are deemed noncritical, or motors are critical but not backups of each other. Power conductors for motors over 3 HP and critical loads without backups shall run in separate conduits. The conduit

schedule, if provided, shall override the above provisions. Conduit fill shall meet the requirements of the National Electrical Code.

1603.12.2 Instrumentation and Signal Wire (2/C - 2 conductor, 3/C - 3 conductor)

2/C signal wire where used shall be single twisted pair shielded AWG#18 stranded copper wire with .021" nylon insulation thickness and an overall jacket thickness of .045" PVC. Wire shall have 7 strand minimum. Shield to be bare tinned copper wire with an aluminum polyester shield tape. A nylon rip cord under the jacket shall simplify stripping. PVC jacket shall be flame retardant and meet or exceed IEEE 383, 70,000 BTU Flame Test. Wire shall be Alpha Wire Corporation Catalog No. 5616B1801 or approved equal.

3/C signal wire where used shall meet the same requirements above except it will be a single twisted triple shielded wire and be Alpha Wire Corporation Catalog No. 5646B1801 or equal.

Install and terminate signal wire per manufacturer's and Engineer's recommendations and as necessary for a correct and working installation. Typically the signal wire shield will be grounded at only one end. Ground only at the control panel end or as directed by the Engineer. Signal wires shall be sealed to the prevent migration of moisture into the cable and to prevent unintentional grounding of the shield at the open end. Electrical Contractor shall seal signal wires by means of a 1 inch piece of clear heat shrink tubing installed over PVC jacket and individual wires, and heat shrunk to a water-tight fit.

1603.13 Grounding

A complete grounding system shall be installed in accordance with Article 250 of the NEC code entitled "Grounding" and as shown on the drawing and specified herein.

Ground rods shall be 5/8" x 10' copper clad (minimum size) or as shown on drawings.

Ground fittings shall be O-Z/Gedney Type BF, OF, LF, HG or equal.

The ground conductors shall be either green insulated or bare copper conductors. Bare conductors may be concrete encased. Bolted ground connectors shall not be used underground or in concrete encased areas unless specified. Underground or encased ground points shall in general be cadwelded.

The system is intended to protect the personnel and equipment from possible abnormal voltage conditions. It shall connect the motor frames, heating and ventilating units and ducts, all metallic conduit, lighting panelboards, all switchgear and transformer enclosures, junction boxes and related items, and all current conducting equipment and materials to an adequate and effective ground.

The grounding system shall be connected to three approved copper-clad ground rods driven into permanently moist soil.

Care shall be exercised to ensure a good electrical continuity of the conduit system including connection between the conduit and metallic enclosures of the main service panel, lighting panel, and the like, installing ground jumpers where necessary to accomplish this. All flexible conduit connections to electrical equipment shall have a separate ground wire connection in addition to the flexible conduit shell connection.

All raceways shall have a green ground conductor adequately sized per table 250-195 of the National Electrical Code. Ground conductors shall be installed in raceways for lighting, control, receptacles, power circuits, and other electrical equipment. The minimum size for grounding conductors is AWG#12.

1603.14 **Wiring Devices**

Furnish wiring devices from listing below. Wiring devices shall be as provided by Hubbel or approved equal. Hubbel numbers are indicated.

Switches: 20Amp, HBL 1221I, HBL 1222I, HBL 1223I, HBL 1224I.

Receptacles: NEMA 5-20 specification grade (minimum)

 Duplex grounded receptacle; 125 V, 20 A, 5362I

 Ground Fault receptacle; 125V, 20A, GF-5362I

 Isolated Ground; 125V, 20A, IG-5362

Outdoor Outlets: Hubbell GF-5362I, receptacle with ground fault protection.

Surface outlets shall have plates to match Appleton, or equal, cast boxes. In corrosive areas, cast metal shall be PVC coated with a polyurethane interior lining similar to junction boxes.

All Class 1, Division 1 or 2 devices shall be Appleton, or approved equal.

All other switching devices shall be products listed and classified by U.L. suitable for the environmental conditions and purpose specified, as manufactured by Square D or approved equal.

All products shall be installed per manufacturer's instructions.

1603.15 **Outlet Boxes**

Cast metal outlet boxes shall be provided for all outlets and of a size adequate for the number of wires and splices. All boxes shall be securely mounted in an approved fashion and set true with the floor surface. Cast metal boxes shall be provided with integral hubs similar to junction boxes (see section 1603.11).

Boxes shall be of a depth to accommodate wires and splices and shall be equipped with both fixture hanging studs and tapped fixture ears. Boxes shall be installed so they will support the weight of the fixture.

For weatherproof switches, devices, and exterior devices use Appleton or approved equal cast boxes with proper cover and gasket.

Boxes in corrosive areas shall be PVC coated with a polyurethane interior lining.

All exposed wall and ceiling outlet boxes and small junction boxes shall be Appleton, or equal cast type FD with approved covers.

Receptacle cover plates shall be Appleton Catalog #FSK-1DR, FSK-WGF1 or FSK-WRD

Switch cover plates shall be Appleton Catalog #FSK-1TS, FSK-WT2 or equal.

1603.16 **Location of Outlets and Equipment**

It must be understood that electrical drawings and details are diagrammatic. They are not intended to be shop drawings. It is expected that it may be necessary to move conduit, outlets and/or equipment in some cases to get a coordinated installation and such changes are considered a part of the contract obligation without cost to the Owner. No outlets or equipment door swings, counters, equipment, etc. shall be located where their usefulness and/or operation will be affected by the work of other Contractors.

1606. LIGHTING

1606.1 **Scope**

All lighting fixtures and appurtenances are to be provided complete and installed with the necessary accessories for a proper and working installation.

Provide and install all lamps for all fixtures of size and type as recommended by the fixture manufacturer and as scheduled.

Fixture types are indicated on the drawings and as specified in this division.

Installed fixtures shall be the approved equal of those listed in the fixture schedule.

1606.8 **Alignment**

Align luminaries and clean diffusers prior to final acceptance.

Surface mounted fixtures on walls, ceilings or in control panels shall be anchored so they cannot be rotated and no light leakage appears. No plastic or composition type anchors shall be used.

1606.9 **Installation**

Fixtures shall be installed only after structure is enclosed and weathertight. Drawings are diagrammatic and coordination of installation with other trades will be required. The Contractor may need to make minor changes in the location of fixtures and these are considered a part of the contract.

All diffusers or lenses shall be glass, non-yellowing acrylic, or polycarbonate and be free of cracks or chips. All reflectors shall be clean and free of dents or scratches at time of final inspection.

1606.11 **Fixture Schedule**

<u>Type</u>	<u>Fixture Description</u>	<u>Lamp Description</u>
B	V-51 Enclosed and Gasketed Incandescent Fixtures with Guard Suitable for Use in Wet Locations 3/4" hubs as needed	General Electrical Watt Miser A-Line Lamps Life Hour 750 135 Watts, A-21
C	A-51 Incandescent Explosion-Proof Light Fixture with GUARD 15° short bracket 150-300 Watt, A-23 Appleton Catalog #ASB1575G	General Electrical Watt Miser A-Line Lamps Life Hour 750 135 Watts, A-21 Catalog #150A/135 WM

SPECIAL REQUIREMENT--This fixture shall be PVC coated under the same requirements as PVC-coated urethane-lined rigid steel conduit.

1607. ELECTRICAL SERVICE SYSTEM

1607.1 Scope

This section of work includes the basic requirements for the Electrical Service System. The Contractor is responsible for the complete coordination and installation of the electrical system.

1607.2 Service Characteristic

The utility company is Alliant Energy

The utility service shall be underground type, minimizing the visual impact of the area.

The secondary service will be 200 amp, 480/277 volt, 4 wire, 3-phase system with manual transfer switch and generator receptacle.

Service will be located in an area where a generator receptacle will be easily accessible to a vehicle-drawn portable generator. **Service location shall be approved by Engineer prior to installation.**

Service drawings shall be followed as close as possible. Minor modifications or adjustments may be necessary to complete the underground service and shall be included in the bid.

The meter sockets shall be weatherproof and comply with utility standards. Meter sockets shall be mounted by the Contractor with interconnecting conduits as required. Coordinate type and installation with the Utility.

All work not provided by the Utility, yet necessary for a complete service system will be supplied by the Contractor.

Service shall be constructed to fulfill all national, local, and utility code requirements.

Fuses shall be installed in disconnects (2) with three spares provided. Fuse type will be Bussman LPS-RK-200SP. No exceptions.

All substitutions (equals) of service equipment must be approved by Engineer.

A complete grounding system shall be installed in accordance with Article 250 of NEC entitled "Grounding" and as shown on the drawings or as specified under Section 1603.13 Grounding.

1607.3 Definitions

Utility - Alliant Energy

Service--as defined in the NEC, Article 100

Primary Voltage--Above 600 volts

Second Voltage--600 volts and below

1607.4 Sequencing, Scheduling

Provide electrical service system.

Coordinate the installation of the electrical service to the pumping station with the Engineer and the Utility. All Utility costs shall be included in the lump sum bid.

Obtain all permits, inspections, and affidavits to comply with the NEC, the requirements of the Local Inspector, and the Utility requirements.

1607.5 Underground Electrical Service

Service conduits shall be PVC coated rigid steel as specified in section 1603.10.3

Conduits shall be direct buried with a minimum of six (6) inches of pea gravel surrounding the conduits, on the top, sides, and bottom. Base shall be compacted to the Engineer's satisfaction prior to setting conduits in trench. Cover pea gravel with a minimum of one (1) foot select sand and fill remainder to grade with topsoil.

Install top of duct lines a minimum of 30 inches below finish grade and pitched for drainage (where possible).

Notify engineer 24 hours in advance prior to backfilling of any underground electrical work.

1608. Motor Controls

1608.1 Scope

In general, the Contractor will be responsible for all power, motor, and motor control connections on this project. Unless otherwise noted or accepted, the equipment specified in this section shall be furnished by the Contractor.

All motors will be provided by others, except as noted, ready for connections. The Electrical Contractor shall be responsible for electrical connections for power and control circuit wiring, proper phase relationships, and correct motor rotation.

1608.2 Description

Provide motor circuit wiring for each motor from the source of supply to the terminal box on the motor including all required intermediate connections at devices such as motor starters, disconnect switches, etc.

Provide motor starters as specified for all motors, unless shown or specified that starters or control equipment will be furnished by others.

Provide control wiring including temperature control wiring for operation, control, and supervision of all motorized equipment including wiring between motor starters and control devices as specified and as shown on the electrical drawings.

All motor control wiring shall be installed in accordance with control wiring diagrams furnished by the trades involved and as approved by the Engineer. The Contractor is responsible for all motor control wiring unless otherwise shown on the drawings or stated herein.

1608.3 **Motor Control Equipment**

1608.3.1 Motor Starters

Provide NEMA rated magnetic motor starters for all single and three phase motors less than 10 HP, except single-phase motors scheduled to be provided with manual starters or specified otherwise.

All starters shall be equipped with overload protection in each phase consisting of thermally actuated heaters and temperature compensated overload relays. Starters shall be as manufactured by, Allen Bradley, Square D or approved equal.

Manual starters shall have thermally actuated heaters where required.

Manual starters shall be equipped with pilot light.

Heaters shall be selected on the basis of nameplate horsepower and service factor. If power factor correction capacitors are provided, overload protection shall be compensated for the lower motor running current due to improved power factor.

Starters for lift station pumps must be reduced voltage starters. The starters shall be solid-state type as manufactured by Allen Bradley, Type SMC-Flex Smart Motor Controllers, Cat. No. 150-F, complete with Pump Control option and EtherNet communications module. Allen Bradley line side protective module accessory shall also be provided and installed. Coordinate and provide properly sized starters consistent with the actual pump motors installed. The Engineer must approve any substitution.

Solid State Starters shall have phase loss protection, shorted SCR protection, and adjustable solid-state overload protection.

The Solid State Starters shall be installed in an adequately sized enclosure and powered from a thermal magnetic input circuit breaker in the control panel (see panel layout drawing) to provide a complete motor control unit for each pump.

Contactors and/or starters shall be equipped with the auxiliary devices as required.

1608.3.2 Disconnect Devices

Provide disconnect device for all motors in accordance with applicable codes and as specified and shown on plans.

Padlocking facilities shall be provided to positively lock the disconnects, either the on or off position with from one to three padlocks whether the door is opened or closed.

1608.3.3 Enclosures

Enclosures in indoor locations shall be NEMA type 12.

Enclosures in outdoor locations shall be NEMA 12, 3R with drain screw removed from bottom.

Enclosures in hazardous locations shall be U.L. listed for the particular, class, division, and group requirements of the space and contents.

Starters and disconnect devices for motors shall be installed in common enclosures, combination type, with all accessories such as pilot lights, H O-A switches, mounted in the enclosure front unless specified or shown otherwise.

All control devices shall be as specified in Section 1612.9

1612. Controls and Instrumentation

1612.1 Scope

This section of work includes the basic requirements for Control and Instrumentation. Coordinate system installation with the Owner and other Contractors as required and specified herein and elsewhere in the specification and on the drawings. Applicable parts of this section shall also apply to equipment provided under section 1608.

1612.2 Description

Furnish and install the equipment as specified herein. In addition coordinate control system work with the Engineer and other Contractors as specified and as necessary to provide a fully working system.

Provide the control equipment as specified under division 1608 - Motor Controls. Provide and install the Station Control Panel and coordinate startup and checkout of system with the Engineer. Provide and install everything necessary to obtain a complete and working installation of the Station Control Panel. Provide all motor control appurtenances such as pushbutton stations; selector switches, etc. (see Division 1608). Wire to all other package control systems provided by others.

These specifications state the results desired and equipment to be used.

1612.3 **Electrical Equipment**

All wiring shall be color coded (see wiring identification section) and numbered at each termination and include individual terminal strips for all external connections. Wiring shall be flame retardant type. In general, control wiring (within panels) shall be sixteen gauge-stranded minimum. Integrated circuits, solid state modules, or other open type wiring shall be separately enclosed with removable panel sections or covers for ease of inspection or service. Ribbon type cable shall be securely clamped ahead of terminal connections to prevent strain on printed circuit board connections.

All cable terminations not on standard screw type or clamp type terminals shall be enclosed or protected from accidental contact or mechanical abuse.

All visual indicating lamps shall be push-to-test indicating type, clearly visible under normal day time indoors, LED type as manufactured by LEDtronics, and size and color approved by the Engineer.

The Contractor shall furnish comprehensive schematic and wiring diagrams of equipment he supplies. In addition, separate drawings are to be furnished showing all circuits and equipment located at each point in the system. The diagrams shall show all exterior motors and control devices, schematic wiring of the equipment, and all connections to be made to exterior motors or devices. Terminal connections in the equipment shall be numbered to correspond to the diagrams for use in making exterior connections. Wiring diagrams shall be coordinated so that terminal numbering, circuit designation, and equipment drawings must be submitted and approved by the Engineer before installation, but such approval will not waive any specification requirements unless so specifically stated. Final approval will be made after checking the equipment when operated in the field.

All wires entering the enclosures shall be terminated at labeled terminal connections.

The Station Control Center shall be completely assembled and tested at the Panel Builder's shop prior to shipment. The Owner will program the Allen-Bradley controller and check out equipment at the Panel Builder's location. The Owner requests available access at times throughout the project for periodic inspection of the panels and this programming and checkout task. Owner will coordinate and cooperate with the Panel Builder's shop schedule and facility constraints. However, the Owner fully expects the Panel Builder to cooperate in allowing inspection, programming, and checkout periods.

The Contractor is reminded that wet wells and various areas as noted on the Plans may be classed as Class 1, Division 1 or 2, Group C & D, Hazardous Areas. All devices in these areas shall be intrinsically safe or rated for use in the classified area.

1612.4 **Float Switches**

Float switches when specified herein, shown in the plans, or required to complete an operating system shall be Consolidated Model 9G or equal with the following minimum requirements:

- a) The float switches shall consist of a 316-type stainless steel housing 5-1/2 inches in diameter with a stainless steel mounting clamp and a flexible three-conductor cable with a synthetic rubber jacket. Inside the float housing will be a normally open or normally closed (as required) mercury switch potted in epoxy. The electrical load for the switch contacts will be 230 volts DC/AC into an inductive load. Float switch shall include a three-conductor 14 AWG cable with 105 strands per conductor made for heavy flexing service and underwater use. Cable length shall be fifty feet minimum. Connect via watertight cable connector to a cast junction box at grade floor elevation in the pumping station wetwell side. A green grounding wire will connect internally to the float housing.
- b) Weight and buoyancy shall be such that contaminants will not result in the float switch changing operating level more than one inch.
- c) Contractor is reminded that various locations require intrinsically safe equipment. Intrinsically safe interface units shall be provided with each float located in hazardous areas.
- d) Five (5) inch diameter floats will not be accepted on this project.
- e) Mount float switch as required and at elevation specified by Owner. Coil spare cable in wet well and attach to mounting with plastic tie wraps.

1612.5 **Intrinsically Safe Interfaces**

Intrinsically safe interfaces shall be provided for all contact closure devices in hazardous areas (wetwells) i.e. float switches. Intrinsically safe interfaces shall operate from 120 VAC and outputs shall be interfaced to field devices and panel equipment as required. Intrinsically safe interfaces shall be as manufactured by Telemecanique NY2A21 (1 channel) or Type NY2B31 (2 channel) or approved equal.

1612.6 **Relays**

120 VAC relays supplied on this job shall be Allen Bradley type 700-HB33A1 or equal with sockets for mounting in a snap-in track. Sockets shall be easily removable from snap-in track by removing wire terminations only.

1612.7 **Power Monitor**

Power monitoring relay shall provide continuous three-phase protection for motors and critical electrical equipment. Power monitoring relay shall be as manufactured by Square D, Class 8430, Type MPDV29 - 480 volt or approved equal.

1612.8 **Elapsed Time Meter**

Elapsed time meter shall feature steel case, completely sealed for server environments, non resettable and capable of maximum reading 99999.9 hours. Elapsed time meter shall be as manufactured by Redington Catalog Number 720-0004 or approved equal.

1612.9 Control Devices

Control switches and push buttons shall be Square D type K, or approved equal.

Push buttons shall be as follows and shall be Square D Model KR1U or approved equal:

Start--Black, normally open, momentary close
Stop--Red, normally closed, momentary open
Emergency Stop--Mushroom headed, red, normally closed, maintained open

Selector switches shall be Square D Model KS11B (2 position), KS43B (3 position), or approved equal.

Indicating lights shall be push-to-test type 120 VAC Square D Model KT-38 with plastic Fresnel lens cap, or approved equal. Lamps shall be LED type. Lens caps and lamp color shall be matching.

1612.10 Station Control Center *(Details specified herein apply to all Control Panels)*

1612.10.1 Scope

The Station Control Center (SCC) is intended to provide control and monitoring of all critical pumping station features; Wetwell Level Control for Pumping Operation, Radio Telemetry to Owner's Main Facility, etc. The SCC shall also control and/or monitor the Pumping Station's systems providing control and alarming functions.

Also see the applicable electrical drawings section 1625

The Owner demands a high degree of accuracy and neatness in the design, construction and implementation of the control panels specified herein. Owner will inspect the panels at various times throughout the construction to insure proper quality and appearance.

1612.10.3 Enclosure Construction

The Station Control Center shall be a gasketed NEMA type 4 cabinet with all equipment factory wired, assembled, and tested.

Panel Enclosure shall be as manufactured by Hoffmann catalog number A-74H72JULP with Interior Panel, catalog number A-72P72 or approved equal.

Enclosure shall be insulated with .75-inch high quality flexible, closed-cell polyethylene thermal insulation. Insulation must have a flame spread rating of 25 or less and a smoke development rating of 50 or less as tested by ASTM E-84 method. Insulation shall be applied to enclosure's interior before installing sub-panel. Sheet insulation must be installed with 100% coverage of approved contact adhesive. In all cases, both surfaces to be joined must be coated with adhesive and joined after the appropriate tacking time.

Panel shall match layout drawings and schematics provided with the specification as closely as is practically possible.

The panel shall be constructed such that all switches and meters are easily accessible and in no case mounted over six feet six inches above the floor.

1612.10.4 Installed Equipment

The equipment to be installed in the control panel and utilized for this control system shall include, but not be limited to, the following pieces of hardware (no substitutions);

Supplied and Installed by Panel Builder:

Allen-Bradley, 1769-L35E, CompactLogix Programmable Controller with the appropriate auxiliary cards and devices as necessary.

Square D, Class 8430, Type MPDV29 480 volt.

Telemecanique Intrinsic Barriers, NY2B31

Square-D Disconnect Switch 2510 KG1A

Allen-Bradley Relays 700HB33A1

1612.10.6 Panel Appurtenances

◆ 1612.10.6.1 Terminals and Connections

Terminal blocks shall be 600-volt screw terminal type and include mounting strips, solid jumpers (as needed), marker strips, and end clamps. Terminals shall be Allen-Bradley type 1492-F1, track mountable. Mounting track shall be Allen-Bradley type 1492-N1.

Terminal blocks shall be mounted near the bottom of the enclosure and all wiring to and from field devices shall terminate there. Twenty (20) percent spare terminal blocks shall be provided and installed in the panel.

Terminal blocks shall be separated to allow for wireway and wire bends as necessary. The arrangement shall afford maximum accessibility of terminals for ease in wiring, testing, and visibility for recognizing wire and terminal numbers.

Terminal blocks shall be grouped via I/O type, power, special, and intrinsically safe wiring. Intrinsically safe wiring shall be separated from all other wiring and be light blue in color and marked "Intrinsic Safety Wiring". Other groupings not listed shall also be grouped as applicable.

Each terminal block point shall be identified on a marker strip with permanent, non-smear black ink. Identifying numbers shall be as shown on the shop drawings.

Terminal block points shall be arranged in numerical order as according to the shop drawings. Numbering shall match programmable I/O points, or loop numbers where possible. Use other standard wiring conventions where this is not possible. Wire numbering shall match terminal numbering.

◆ 1612.10.6.5 Brady Tags and Labeling

Equipment and wiring identification shall conform to section 1603.9.2 except as herein modified. Wire identification shall be Brady IDXPRT Labeling Printer with Self-Laminating Vinyl, PermaSleeve Heat-Shrink Polyolefin or approved equal. Panel devices shall all be labeled with engraved gravoply laminated nameplates with white letters on a black background. Include device ID number as well as a descriptive name. Enter lettering on each line. Use minimum 3 mm high characters. Mount labels with stainless steel machine screws.

Identify conductors with the wire numbering tags specified above at all termination points and devices. Identification shall match wire schedules and shop drawings.

In addition to the above requirements the wire and/or cables shall meet the following color code:

AC Power to panel & devices	Black
Neutral Wires	White or Gray with tracer
Foreign Voltage Wiring	Yellow
Ground Wiring	Green
AC Control Wiring	Red
DC Control Wiring	Blue

All intrinsically safe wiring shall be identified with permanently affixed labels with the wording "INTRINSIC SAFETY WIRING" and by using **light blue** wire. Where practical insulation color should follow this color code. Where not practical (i.e. larger wire sizes) wire should be marked with the appropriate colored tape.

◆ 1612.10.6.6 Plastic Wireway and Spiral Wrap

White plastic wireways and spiral wrap shall be used throughout the panel to facilitate neat and easy routing of wires. Use plastic spiral wiring wraps outside of wiring ducts. Securely fasten the bundles to the steel structure with stainless steel machine screw cable tie or wire mounts (not adhesive backed) at intervals not exceeding 12 inches. Bundles shall contain a maximum of 30 wires.

Use Panduit, or equal wiring ducts with covers sized for a minimum of 30 % spare capacity and also a minimum size of 1.5 inches by 3 inches.

◆ 1612.10.6.7 Panel Wiring and Construction

Conductors in control panels shall be grouped as to circuits and arranged in a neat and workmanlike manner with crosses kept to a minimum. All conductors of a similar type shall be grouped, bound together with nylon ties and identified. Wiring for each piece of equipment in a control panel shall be neatly installed, grouped by equipment, and wire wrapped with Panduit Spiral Wrap or equal from where it leaves the raceway system until it enters plastic wiring ducts or terminates at the terminal strip. The intent is to protect the wire, allow quick and easy wire and system identification, and keep the appearance neat and organized.

Use flexible stranded copper wiring. Run in continuous lengths to terminals. Do not splice wires.

For analog signal wiring, use uniformly twisted shielded pairs as specified in section 1603. Wiring shall not be smaller than #18 AWG with a minimum of six twists per foot. Separate analog wiring from power wiring. Provide continuous foil or metalized plastic shields with 100% coverage. Include a drain wire in continuous contact with the shield.

Use 16 AWG or larger for control signal wiring. Wiring shall be TFFN / THWN.

Use 12 AWG or larger for power wiring. Wiring shall be XHHW-2 with 600-volt insulation.

Segregate signal wiring from control power wiring, group functionally, and arrange neatly to facilitate tracing of circuits.

Wires will typically be connected directly to pressure type terminal connections. Where this is not possible, crimp-on type spade lug connectors shall be used.

A grounding terminal bus shall be installed in the bottom of the panels. All lugs and components required for connections to the ground bus shall be provided. Ground panels to Pumping Station system ground bus.

1612.10.7 Allen-Bradley Equipment

The Allen-Bradley programmable controller shall be a CompactLogix with the following cards and features:

Quantity	Item
1	120 VAC powered Power Supply - Catalog No. 1769-PA4
1	CompactLogix Processor - Catalog No. 1769-L35E
1	End Cap - Catalog No. 1769-ECR
2	16 Input, 120VAC Input Cards - Catalog No. 1769-IA16
2	8 Output, Relay Output Module - Catalog No. 1769-OW8

1612.11 System Functional Description

Level sensing will be accomplished by means of five floatballs. Normally operation will be accomplished by three of these.

All control of the pump operations shall be through the PLC. The float switch will signal the PLC on rising or falling levels in the wetwell.

1. Upon a rising level, the lead float switch will tell the PLC to start the lead pump. (Time delays in the PLC will prohibit pumps from starting or stopping due to momentary wetwell fluctuation.)
2. Once the lead pump has pumped the level down below the off float, the pump will stop.
3. If lead pump fails, the lag pump will start after a short delay and an alarm will be generated.
4. If one pump cannot pump the station down and the level fills to the lag pump float switch, the lag pump will also start. Both pumps will stop when the off level is reached.
5. If, for any reason, the level should reach the high level float switch, an alarm will be generated and sent via the radio telemetry unit to the Madison Metropolitan Sewerage District operators console for dispatching of maintenance personnel.
6. If the off float switch fails to stop a pump's pumping operation, the low water cut off float switch will stop the pump and alarm once the level falls below it.
7. Lead pump shall be selected via a 1-2/ ALT /2-1 switch on the front of the panel. In "ALT", the lead pump will automatically alternate.
8. In the event of power failure, the power monitor will generate an alarm. Upon reenergization, an adjustable delay will prevent the pumps from starting immediately. Typical delay time is 30-60 seconds.

1612.12 Owner's Telemetry System

Contractor shall reserve space on the Station Control Center back panel for Owner to attach his radio telemetry equipment to. See drawings.

The Owner will install the radio telemetry equipment: antenna, radio, and connections thereto.

A 15 Amp circuit breaker shall be provided for connection of power to the telemetry equipment.

1612.13 Telemetry Antenna System

Contractor shall construct telemetry antenna tower per drawing 1625-19.

1.25-inch PVC conduit shall be provided for an underground raceway between the antenna base and the Electrical Enclosure. This is intended as means to route the antenna cable into the Electrical Enclosure from the antenna tower.

Antenna Tower is to be grounded with three, 10-foot ground rods equally spaced. Top of ground rods shall be buried 20 inch below finished grade.

Join and connect ground rods with 6-gauge solid copper wire.

All terminations to ground rods must be CADWELD exothermically connected.

Antenna tower grounding grid must be bonded to electrical service grounding grid with 6-gauge solid copper wire.

All tower grounding must comply with local and national electrical codes.

1615. Owner (MMSD) furnished / Installed Equipment

1615.2 Owner Furnished Equipment

928/952 MHz Radio with Enclosure

Radio Antenna, Decibel Products, Cat. Number DB499-K

Antenna Cable, Helix Coaxial Cable and fittings, Codes 841476 A9530

1615.3 Owner Installed Equipment

The following equipment will be installed by the Owner:

928/952 MHz Radio with Enclosure

Radio Antenna and Helix Coaxial Cable

1615.4 Owner Performed Work

The Owner will perform the following work:

Programming of Allen Bradley CompactLogix unit in the SCC

Assist with Checkout & Startup - Wastewater Pumps & Controls
(Owner will verify proper operation of SLCs)

Assist with Checkout - Manual Transfer Scheme
(Owner will verify proper operation and coordination with portable generator)

Assist with Checkout & Startup - All Equipment in SCC
(Owner will verify proper operation of programming)

Checkout & Startup of Radio Telemetry System

(Owner will startup and checkout the radio telemetry system; full cooperation by Contractor for repair of improper or defective equipment is required)

1616. MISCELLANEOUS DETAILS

1616.1 **Scope**

This technical specification section includes supplemental details and clarifications as part of the plans and specifications.

1616.2 **Cable Schedule And Wiring Requirements**

Unless otherwise specified Contractor shall size power and control cables and conductors in accordance with the following schedule, or as specified on the Conduit and Wire Schedule drawing and section 1603. For conduits and wiring specified on the Conduit and Wire Schedule, the schedule in the Electrical Drawings shall overrule. All other conduits and wiring shall be per the following:

Protective Breaker or Fuse Ampere Rating	Minimum Size Copper Conductor 75 Deg. Rated for Wet or Dry Area <u>THWN/XHHW</u>
Up to 20A	12 AWG
30A	10 AWG
40A	8 AWG
60A	6 AWG
80A	4 AWG
100A	2 AWG
125A	1 AWG
150A	1/0 AWG
200A	3/0 AWG
225A	4/0 AWG
225 A & Greater	As noted on plans

All control conductors in panels to be No. 16 AWG stranded TFFN unless otherwise specified. Control wire between panels and/or field devices shall be 14 AWG stranded THWN.

Excess circuit lengths will have increased conductor sizes as noted on plans.

1616.3 **Concrete Pad for Station Control Panel**

Station Control Panel will be secured to a 12" thick concrete pad with # 5 bars 12" on center each way. Control Panel shall be typically placed on the pad with 12" on the backside, 12" on

the left and right sides and four feet in front of panel. Please refer to the project site plan for detailed layout.

1625. Drawings

1625.1 **Scope**

All construction shall conform to these specifications and to the attached drawings.

APPENDIX A

SOIL BORING LOGS/REPORTS



CENTRAL WISCONSIN AREA:
3217 Whiting Avenue
P.O. Box 127
Stevens Point, WI 54481 -0127
(715) 341-7974 • Fax (715) 341-8654

MADISON AREA:
5620 Woodland Drive
Waunakee, WI 53597
(608) 849-9120 • Fax (608) 849-9122

SUBSURFACE INVESTIGATION

PROPOSED SANITARY SEWER
FORCE MAIN
MID-TOWN ROAD
CITY OF MADISON
DANE COUNTY
WISCONSIN

NTS 755.08

PREPARED FOR:

VIERBICHER ASSOCIATES
999 FOURIER DRIVE, SUITE 201
MADISON, WI 53717
ATTENTION: MR. DARRIN POPE

FIELD INVESTIGATION BY:

NUMMELIN TESTING SERVICES, INC.
WAUNAKEE, WI

AUGUST 27, 2007

Vierbicher Associates staked the boring locations and determined the ground elevations near each boring location. NTS determined the approximate elevation at each boring location by use of a topographic map provided by Vierbicher Associates. Vierbicher Associates also determined the proposed depth of boring, which is expected to extend below the pipe invert. Borings #1 and #2 were performed 11 feet and 12 feet south of their proposed locations, respectively. These borings were performed away from staked locations because of conflicts with both overhead and underground utilities. These borings were drilled slightly deeper than their proposed depths so the bottom of boring would be at the same elevation as at the proposed boring location (the ground surface was lower at each proposed boring location).

The soil samples from the borings were examined by this writer for verification and clarification of the soil descriptions that appear on the soil boring logs. Soil design parameters noted in this report have been estimated on the basis of experience. No laboratory tests were performed.

4. SUBSURFACE CONDITIONS

4. 1. Area Geology

Soils along the western end of the force main route are mapped as outwash deposits, while soils along the eastern end are mapped as ground moraine deposits. Outwash deposits are sand and gravel deposited by glacial melt water in an apron in front of the ice margin or in valleys leading away from the margin. Ground moraine deposits consist of an unstratified mixture of clay, silt, sand, gravel, cobbles, and boulders (till). The surface of this area is often covered with a wind-blown silt deposit (loess) that is often weathered to a clay.

4. 2. Soils At Boring Locations

Boring #1 encountered 6 inches of crushed rock base course at the surface. Below this, soft to medium-consistency sandy clay fill was encountered to a depth of 3.0 feet, then soft to medium-consistency sandy lean clay (possible fill) was encountered between 3.0 and 7.5 feet. Soft to medium-consistency mottled lean clay was encountered between 7.5 and 11.0 feet, and loose silty fine sand was encountered between 11.0 and 11.5 feet, the end of boring #1.

Boring #2 encountered 3 inches of crushed rock base course at the surface. Below this, soft to medium-consistency sandy clay fill was encountered to a depth of 3.5 feet, then soft mottled lean clay (probable fill) was encountered between 3.5 and 6.0 feet. Boring #2 then encountered loose to very loose clayey sand to 12.0 feet, the end of boring.

**Subsurface Investigation
Proposed Sanitary Sewer Force Main
City of Madison, Dane Co., WI**

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Boring #3 encountered 6 inches of brown sandy lean clay fill at the surface, over 3.0 feet of sandy clay/clayey sand fill. Boring #3 then encountered loose to medium-dense silty fine sand with little gravel from 3.25 to 10.0 feet, the end of boring.

Water occurred in boring #1 at a depth of 2.3 feet after 0.5 hours, and in boring #2 at a depth of 1.8 feet after 1.0 hours. 'Free' water was not encountered in boring #3. These water conditions are representative of the site at the time of drilling only.

See individual boring logs for soil characteristics and depth to water at a specific location.

5. DISCUSSION AND RECOMMENDATIONS

5. 1. General

Soils encountered at the boring locations appear suitable for support of the proposed sanitary sewer force main. See below for our recommendations.

Groundwater was encountered in two of the borings and therefore should be anticipated during construction. Also, be aware that overhead and underground utilities occur a short distance from the proposed force main route.

It is recommended that all proposed weight bearing soils be inspected by NTS or another qualified soils engineering firm to verify that adequate bearing capacity is present.

5. 2. Sanitary Sewer Lines

Three borings were performed along the route of the proposed sanitary sewer force main. These borings were performed as close to the proposed force main location as possible.

5. 2. 1. Trenching

Borings along the force main route were drillable to their proposed depths, with no difficulty in drilling. Therefore, it is expected that most large excavators (back-hoes) should be adequate to perform the excavations.

Using a flat plate attached to the bucket teeth of the back-hoe would minimize the disturbance at the base of the excavation. Where a toothed bucket is used, care must be taken to remove or compact all disturbed soil at the base of the excavation. Consider using a flat plate attached to the bucket teeth for final excavation at foundation grade.

If loose soils occur at the trench bottom, they will have to be compacted or undercut. Where groundwater is encountered, undercut approximately 18 inches and replace with compacted clearstone to provide a stable working mat where unstable conditions occur.

Excavation of trenches should be performed fully in accordance with OSHA standards. This will require sloping the sides of a four feet or deeper unsupported side wall trench back at least to a 1:1 slope or full bracing, not spaced braces. Trench work will have to be performed using a trench box or continuous tight-braced sheeting in saturated soil conditions. We leave it to the contractor performing the work to design an appropriate shoring system. Shoring systems must have adequate support at the bottom to resist inward movement.

Be aware that it may be necessary to dewater prior to excavation. See below for recommendations regarding dewatering.

5. 2. 2. Dewatering

Dewatering likely will be necessary in some areas. Dewatering is recommended for excavations extending below the water table where upflow of water is a concern.

If needed, dewatering should be done prior to the excavation work. Recommended method of dewatering is by well points along the trench.

‘Free’ water occurred in borings #1 and #2 at depths of 2.3 and 1.8 feet, respectively. Typically clays and clayey sands would be expected to have a relatively slow rate of permeability, however soils encountered below the apparent water table were soft or loose to very loose and water appeared to flow rather freely within them, at least over a short distance.

Be aware that dewatering with well points may have little effect when more than a short distance from the well since clay typically has a very low rate of permeability. If a small amount of water occurs in the trench it can be removed by sump pumping (see section 5.2.2.1 prior to sump pumping). However if sand or other soil that allows water flow beyond a seeping condition occurs, dewatering prior to excavation will be necessary.

5. 2. 3. 1. Sump Pumping

In some cases, sump pumping of water may be considered by contractors in this area to expedite the pipe installation, but care must be taken to avoid

loosening of the soils that support the pipe. Loosening of the subsoils may result in subsequent settlement, causing failure of the pipe system.

When conventional single-size stone bedding along with sump pumping is used a risk of fine soil loosening exists. Conventional pipe bedding is not a good soil filter, but does provide stability. Sump pumping within trenches may draw fine sand or silt through or into the bedding voids. For this reason, sump pumping is not the recommended method of dewatering within trenches when water flows rather freely. Sump pumping is an acceptable method for removing non-flowing ponded water such as that occurring after a rainstorm or at the base of a trench where soils have a very slow rate of permeability.

5. 2. 4. Foundations

Most undisturbed natural soils will suitably support manholes, valves and similar structures with light loadings. It is recommended that NTS or another qualified soils engineering firm observe the bottom of the excavation to verify the bearing capacity of the soil. Plan to compact all foundation grades. If required compaction levels cannot be obtained, then undercutting may be needed in some locations.

If undercutting is required, NTS or another qualified soils engineering firm should be contacted to determine the depth of undercut.

Where practical, excavations should be performed using a flat plate attached to the bucket teeth of the back-hoe to minimize the disturbance at the base of the excavation.

5. 3. Compaction and Fill Requirements

Where the sewer route is within 'green' areas, we expect that soils excavated from the trench will be used as backfill, as any future settlement, should it occur, would likely cause few, if any, problems. Where the sewer line is within existing or future roadways, mowed lawns, or other locations where settlement would cause concern, we leave it to Vierbicher Associates and the City of Madison to determine whether excavated soils are to be reused as trench backfill. Saturated soils can not be compacted to a degree that would meet typical compaction specifications, but we have seen good results where they are compacted to the highest degree possible. However, some future settlement is possible if the moisture content of the backfill is reduced. Where practical, plan to reuse the material removed during the utility trench excavation so that the backfill soil profile is similar to the adjacent native soil profile. This should minimize the potential for differential movement when subjected to frost

action. However, expect to undercut near-surface soils where roadways are planned, as saturated soils cannot be compacted to a degree that would support the weight of construction traffic.

NTS or another qualified soils engineering firm should verify that proposed fill soils are acceptable. This engineering firm should determine whether the moisture content is appropriate for proper compaction and verify that the proposed fill contains no deleterious material. Frozen soil should not be used as fill.

Compact all foundation grades above the ground water with a high energy compactor, such as a hoepack. With a hoepack, apply full down pressure for 10 seconds per location, overlapping the impact areas. Backfill in lifts not exceeding 1 foot (uncompacted). Be aware that compacting soils near the water table may cause loose sands to become quick (liquefaction). Therefore, it is very important that the subsoils are not allowed to loosen due to upflow of water during excavation. If compaction is required near or below the water table, utilize light compaction equipment, or remove loose soils and immediately replace with clearstone, which should be immediately tamped in with the backhoe bucket.

We leave final compaction specifications to Vierbicher and the City of Madison. Contact NTS if you would like recommendations regarding percent compaction.

Again, where it is required that all excavated soil be reused as trench backfill it is likely that it will not be possible to compact all soils to the specified percent compaction due to them being wet or saturated. Where this is the case, we recommend compacting these soils to the highest degree possible at their existing moisture content. Subsequent settlement of soils that are over optimum moisture for compaction, but are compacted to the highest degree possible, is unlikely unless the moisture content of the soils is reduced after placement.

5. 3. 1. Bedding Material

Bedding for piping generally can follow standard practices providing the single-sized bedding material is not a flow path for water traveling toward dewatering facilities. Any flow of water into the bedding material from below can loosen subsoils and result in settlement later. Therefore, do not pump from within trenches if upflow of water occurs, since this can cause problems in completed areas, as well as within the unfilled areas. There should be no problem with pumping water from the bottom of trenches if it is simply due to precipitation or perched water flowing in from above

5. 4. Corrosion Potential

Any construction materials that will be placed in contact with organic soils should be protected against corrosion.

5. 5. Soil Parameters

Use the following soil parameters for the design of the sewer upgrade project. These soil parameters are considered **ultimate**. Therefore, no safety factor has been considered.

5. 5. 1. Friction Angle

For the silty and clayey sand encountered by the borings, consider a friction angle of not more than 30 degrees. For the clays encountered by the borings, consider a friction angle of 15 degrees.

5. 5. 2. Cohesion

For the silty and clayey sand encountered by the borings, consider a cohesion of zero pounds per square foot. For the clays encountered by the borings, consider a cohesion of 300 pounds per square foot.

5. 5. 3. Unit Weights

For the silty and clayey fine sand encountered by the borings, consider a dry unit weight of 125 pounds per cubic foot (pcf), a moist unit weight of 135 pcf, and a submerged unit weight of 70 pcf. For the clays encountered by the borings, consider a dry unit weight of 90 pounds per cubic foot (pcf), a moist unit weight of 105 pcf, and a submerged unit weight of 55 pcf. When calculating resistance to uplift these numbers are only valid for backfill if it is well compacted.

5. 5. 4. Lateral Earth Pressures

The active lateral earth pressure for unsaturated firm clean fine sand (imported fill) is approximately 35 pcf equivalent fluid. In the passive state, this material exerts about 300 pcf equivalent fluid pressure or more.

The on-site, non-saturated, silty sand will exert between 35 and 40 pcf equivalent fluid active pressure, and between 250 and 400 pcf equivalent fluid pressure in the passive state.

On-site, non-saturated, clays and clayey sands will exert between 55 and 70 pcf equivalent fluid active pressure and between 150 and 250 pcf equivalent fluid pressure in the passive state.


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Be aware that many of the soils at this site are expected to be saturated, possibly remaining so after dewatering. Where the soil is or becomes saturated, the lateral pressures will increase significantly. A saturated soil may exert up to three times as much pressure as a non-saturated soil.

Typically, at-rest pressures are near 55 percent of the vertical pressures.

Respectfully submitted,



Michael J. Krawczyk, P.E.
Nummelin Testing Services, Inc.
mjk/cim

NUMMELIN TESTING SERVICES, INC.

Geotechnical Engineering Report Information

Subsurface soil conditions are responsible for many of the construction problems encountered at building sites. In order to help you, our client, manage your risks, we offer you the following information and suggestions.

Geotechnical engineering reports are based on observations of specific soil conditions existing at the time of the subsurface soil investigation. As these conditions may change over time, construction decisions should be made with the timeliness of the report in mind. Further testing may be advisable if subsurface soil conditions are effected by natural events (flooding, spring thaws, etc.) and construction (drilling, blasting, surcharges, etc.) on-site or adjacent to it. Talking to your geotechnical professional before construction begins will help keep one informed if further tests are recommended.

The recommendations included in your Geotechnical engineering report are based on a limited number of samples/tests. These recommendations assume that subsurface conditions throughout the site will be similar to those observed. As all recommendations are preliminary when based on limited testing, it is important to have your Geotechnical professional observe the actual conditions during construction. This allows him to note any differences that may not have been revealed by the limited samples/testing and/or that are more abrupt than reported in the preliminary report. It is this Geotechnical professional, using his knowledge and familiarity of site history, as well as construction observations, who will be able to determine if there is adequate and appropriate support to consider these recommendations final. He will also be able to document that the contractor is following these recommendations. Be aware that this Geotechnical professional can not assume responsibility and/or liability for his recommendations based on observations and determinations by others.

Professional judgment, based on experience and observations, is at the heart of our Geotechnical recommendations. Geotechnical reports use information from a limited number of samples/tests to predict conditions regarding your overall site. No one may say with certainty what subsurface conditions really exist without actual observation. The conditions away from sample/test areas may vary from what is predicted. It is important to identify variations as early as possible. This is why we encourage you to take advantage of our knowledge and experience during the construction phase of your project. Working together we can help minimize the impact when unexpected variations occur.

Geotechnical reports are written for a specific client, purpose, project, and set of conditions. They are not intended to be a generalized, generic report for a proposed site. They are for the sole use of our client for the express purpose indicated to us. Should the scope of the project be altered, or if subsurface variations become evident during construction, it may be necessary to modify our recommendations. Early communication with your Geotechnical professional can help you avoid expensive problems that may occur when changes to a project's purpose, structure, size, usage, site orientation, elevation, etc. are made after a report is written.

Following these guidelines, your Geotechnical subsurface report should provide informed and accurate information to assist in the planning and construction of your project.

**NUMMELIN TESTING SERVICES
BORING LOG NOTES**

DESCRIPTIVE TERM, GRANULAR SOIL (% BY DRY WEIGHT)

Trace	0% - 5%
Little	5% - 12%
Some	12% - 35%
And	35% - 50%

Q_P = Estimated Unconfined Compressive Strength (by pocket penetrometer) expressed in tons per square foot (t/sf).

Q_U = Estimated Unconfined Compressive Strength (by ASTM 2166) expressed in tons per square foot (t/sf).

N_M = Natural Moisture

M = MOISTURE

D = Dry	F = Frozen
M = Moist	W = Wet
S = Saturated	

LOI = Loss of Ignition (Organic Content)

N (Standard Blow Count) = blows per foot, as shown. Performed in general accordance with Standard Penetration Test Specifications (ASTM D-1586).

NR = No Recovery

WOH = Weight of Hammer

= Sample Number

SOIL CLASSIFICATION

F = Fine	LL = Liquid Limit, percent
M = Medium	PL = Plastic Limit, percent
C = Coarse	PI = Plasticity Index (LL-PL)
W.L. = Water Level	

SOIL STRENGTH CHARACTERISTICS

CONSISTENCY (Cohesive Soils)

<u>Term</u>	<u>Q_u tons/sq.ft.</u>
Very Soft.....	0.0 to 0.25
Soft.....	0.25 to 0.50
Firm.....	0.50 to 1.0
Stiff.....	1.0 to 2.0
Very Stiff.....	2.0 to 4.0
Hard.....	Over 4.0

RELATIVE DENSITY (Granular Soils)

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

SOIL BORING LOG

Boring: 1

Boring By: Nummelin Testing Services, Inc.

Page: 1 of 1

Project: Lift Station and Force Main

Date: 8/21/07

Location: Mid-Town Road, Madison, WI

Elevation: ~1033.5

See Plan

Depth (feet)	Classification/Description	#	Sample Depth(feet)	N	Rec (inches)	M	Qp (tsf)	Notes
1	CABC -----0.5'----- Brown Sandy Clay, Little Gravel (Fill)							
2		1	1.0 - 2.5	3	18	W		
3	-----Water @ 2.3' @ 0.5 hr----- -----3.0'-----							
4								
5	Brown/Gray Sandy Lean Clay (Possible Fill)	2	3.5 - 5.0	3	18	S		
6								
7	-----Wet Cave In @ 7.0'----- -----7.5'-----	3	6.0 - 7.5	4	4	S		
8								
9	Gray Mottled Lean Clay							
10		4	8.5 - 10.0	3	18	S		
11	-----11.0'----- Brown Silty Fine Sand, Little Gravel	5	10.0 - 11.5	8	18	S		
12	-----End of Boring @ 11.5'----- ---Bore Hole Filled With Bentonite Chips---							
13								
14								
15								

SOIL BORING LOG

Boring: 2

Boring By: Nummelin Testing Services, Inc.

Page: 1 of 1

Project: Lift Station and Force Main
 Location: Mid-Town Road, Madison, WI
 See Plan

Date: 8/21/07
 Elevation: ~1037.0

Depth (feet)	Classification/Description	#	Sample Depth(feet)	N	Rec (inches)	M	Qp (tsf)	Notes
	3" of CABC							
1	Brown Sandy Clay, Little Gravel (Fill)							
2	-----Water @ 1.8' @ 1 hr----- Brown Sandy Clay, Little Gravel (Fill)	1	1.0 - 2.5	4	18	M/W		
3	-----Wet Cave In @ 2.8'----- Brown Sandy Clay, Little Gravel (Fill)							
4	-----3.5'----- Gray Mottled Lean Clay (Probable Fill)	2	3.5 - 5.0	2	4	S		
5								
6	-----6.0'----- Gray Clayey Sand, Trace Gravel Tree Root 6' - 7'	3	6.0 - 7.5	11	6	S		
7								
8								
9								
10		4	8.5 - 10.0	2	18	S		
11								
12	-----End of Boring @ 12.0'----- ---Bore Hole Filled With Bentonite Chips---	5	10.5 - 12.0	3	6	S		
13								
14								
15								

SOIL BORING LOG

Boring By: Nummelin Testing Services, Inc.

Boring: 3

Project: Lift Station and Force Main

Page: 1 of 1

Location: Mid-Town Road, Madison, WI
See Plan

Date: 8/21/07
Elevation: ~1048.0

Depth (feet)	Classification/Description	#	Sample Depth(feet)	N	Rec (inches)	M	Qp (tsf)	Notes
1	3" of Dark Brown Sandy Lean Clay (Fill)							
2	Brown Sandy Clay/Clayey Sand, Little Gravel (Fill)	1	1.0 - 2.5	6	18	W		
3	-----3.25'-----							
4								
5	Brown Silty Fine Sand, Little Gravel	2	3.5 - 5.0	4	18	W		
6	-----Wet Cave In @ 6.5'-----							
7								
8	Brown Silty Fine Sand, Little Gravel	3	6.0 - 7.5	11	18	W		
9								
10	-----End of Boring @ 10.0'----- ---Bore Hole Filled With Bentonite Chips---	4	8.5 - 10.0	17	18	W		
11								
12								
13								
14								
15								



Construction • Geotechnical
Consulting Engineering/Testing
March 11, 2009
C09028-1

RECEIVED MAR 16 2009

Mr. Mark Moder
City of Madison Engineering Dept.
City-County Building, Room 115
210 Martin Luther King, Jr. Blvd.
Madison, WI 53703-3345

Re: Geotechnical Services
Mid Town Road
Madison, Wisconsin

Dear Mr. Moder:

CGC, Inc. has completed our geotechnical services for the above-referenced project. At your request, three soil borings were drilled along Mid Town Road between Hidden Hill Drive and Meadow Road. The borings were marked out in the field by CGC personnel prior to drilling and are shown on a boring location plan (copy attached in Appendix A). Elevations at the boring locations were not obtained but can be at a later date upon request. The following paragraphs discuss our observations and provide opinions relative to utility and pavement construction.

SUBSURFACE PROGRAM & OBSERVATIONS

The borings were drilled to depths selected by City personnel utilizing the services of Badger State Drilling (under subcontract to CGC) using a truck-mounted, rotary CME 55 drill rig equipped with hollow-stem augers. Standard Penetration Test (SPT) drilling techniques (ASTM D1586) were used for the full exploration depth at the boring locations. This method consists of driving a 2-inch outside diameter split-barrel sampler using a 140-pound weight falling freely through a distance of 30 inches. The sampler is first seated 6 inches into the material to be sampled and then driven 12 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the log of borings and is known as the Standard Penetration Resistance (commonly referred to as the N-value).

During the field exploration program, the driller visually classified the soils and prepared a field log. Water level observations were made within the borings during and shortly after drilling, which are shown on the bottom of each boring log. Note groundwater was only encountered between 17 and 18 ft below ground surface at B3. Groundwater levels are anticipated to fluctuate based on seasonal variations in precipitation, infiltration, nearby lake/stream stages, etc. Upon completion of drilling, the borings were backfilled to satisfy WDNR requirements (including surface patching) and the soil samples delivered to our laboratory for visual classification and limited laboratory testing. The soils were visually classified by CGC and reviewed by a geotechnical engineer using the Unified Soil Classification System (USCS). The final logs prepared by the engineer and a description of the USCS are presented in Appendix A.

Mr. Mark Moder
City of Madison Engineering Dept.
March 11, 2009
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The attached boring logs indicate that somewhat variable soil conditions exist at the boring locations. In general, 3 to 5 in. of asphalt pavement was present atop 4 in. of base course. The base course was underlain by mostly clayey soils which extended the full depth at the boring locations. Note the top 2 to 3 ft of cohesive soils were slightly organic at B3 and B2 (where the material was also considered possible fill). As exceptions: a 4.5-foot layer of clayey sand was sandwiched between the cohesive soils at B3, and over 23 ft of sands (which extended the full boring depth) were present beneath a thin layer of clay at B1. Please refer to the final logs included in Appendix A for additional information specific to a boring location.

PAVEMENT/UTILITY CONSTRUCTION

General

In our opinion, the lean to slightly organic clays/possible fill materials encountered beneath the base course at B2 and B3 may require some undercutting to accomplish proposed roadway support. While the organic contents of the clays were relatively low based on laboratory test results, the consistencies are unknown at this time due to frozen soils extending up to 3 ft below road surface. Typically, when areas of soft clays are encountered (such as where pocket penetrometer values are near 1 tsf or less), they may need to be undercut/removed and replaced with granular fill or additional base course. Note the lean clay present beneath the base course at B1 had a stiff consistency and would not typically require undercutting. If granular materials are present they should be thoroughly compacted before the placement of additional fill and/or base course. Any pockets of excessively organic topsoil should also be removed. Standard earthwork-related techniques that should be used during roadway construction include:

- Proof-rolling of the exposed subgrades;
- Undercutting and/or stabilization in soft areas; and
- Compaction control of fill/backfill materials (if any).

Should a utility alignment coincide with soft/loose conditions (such as those encountered within the some of the clays at B2 and B3), we recommend that increased bedding thicknesses, possibly underlain by a geotextile, be considered.

Pavement Design

Clays will control the pavement design, as we anticipate that the pavement subgrades will consist of clay soils/clayey fill materials. The following *generalized* parameters should be used to develop the design pavement section:



Mr. Mark Moder
 City of Madison Engineering Dept.
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TABLE 1

AASHTO classification	A-6
Frost group index	F-3
Design group index	14
Soil support value	4.0
Subgrade modulus, k (pci)	125
Estimated percent shrinkage	20 - 30
Estimated CBR value	5

Assuming Mid Town Road is considered a local business/arterial street, we estimate the design daily ESALs (18,000 pound Equivalent Single Axle Loads) will range between 51 to 275 ESALs. A typical pavement design per WDOT Standard Specifications should thus meet E-3 Requirements. Special measures regarding drainage below the pavements do not appear necessary at this time due to the lack of near-surface groundwater.

Compaction Requirements

Regarding utility construction, we anticipate that imported sands will be required for use as backfill which is the typical requirement for City projects. On-site sands could be considered for reuse as trench backfill but they should be separated from any clay soils and selectively stockpiled. Moisture conditioning could be necessary to achieve desired compaction levels. We recommend that at least a level of 95% compaction be achieved within backfill material placed within the final 3 feet below finished subgrades (including undercut backfill - if any), with 90% compaction required at depths greater than 3 feet. The specified levels of compaction are based on modified Proctor methods (ASTM D1557). Also, the backfill material should be placed and compacted in accordance with our Recommended Compacted Fill Specifications presented in Appendix B.

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We appreciate this opportunity to be of service on this project and look forward to working with you as the job proceeds. Other information regarding this report and its limitations is included in Appendix C.

We trust this report addresses your present needs. If you have any questions, please contact us.

Sincerely,

CGC, Inc.



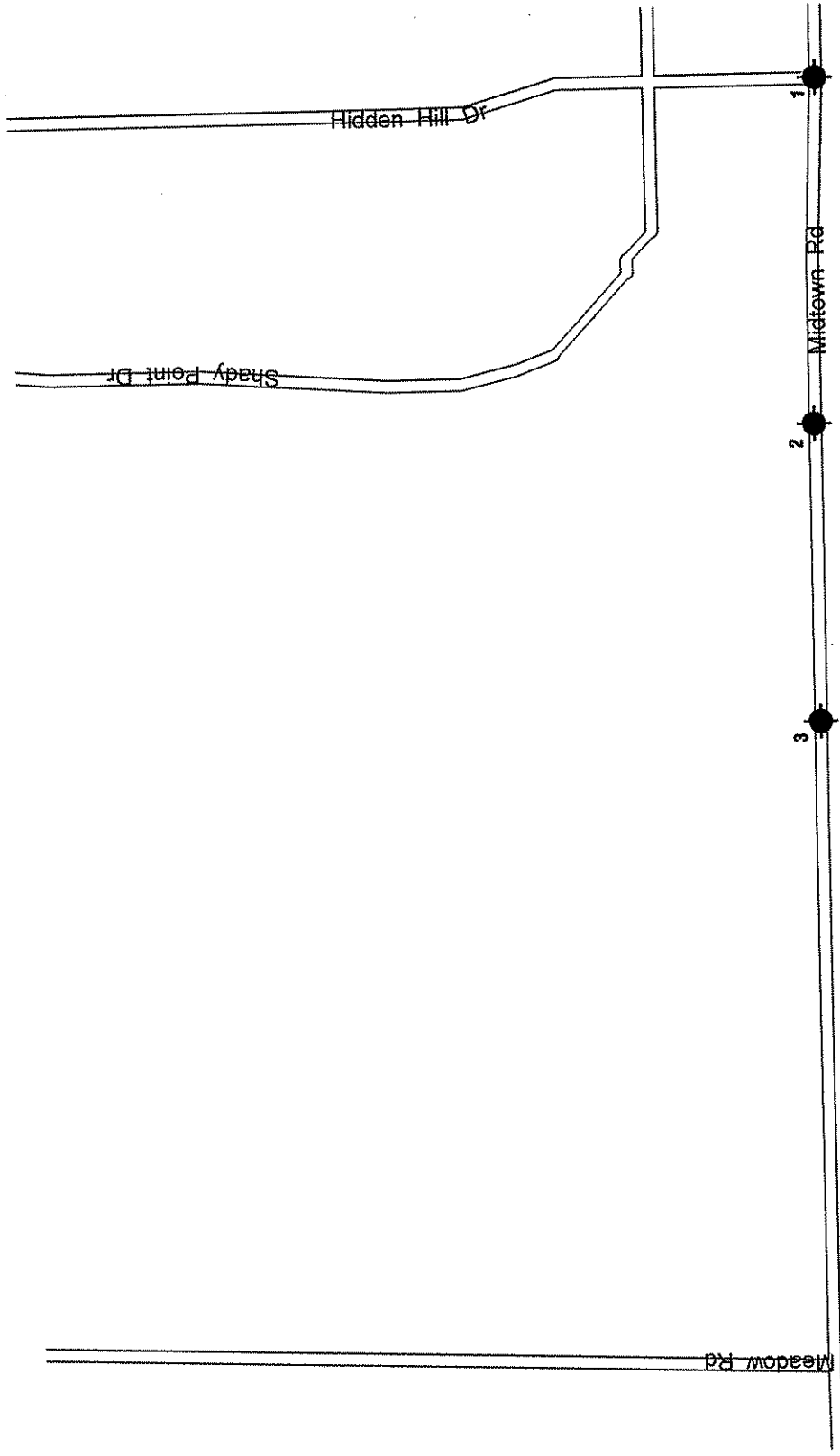
Michael N. Schultz, P.E.
Principal/Consulting Professional

Encl: As stated

cc: Ms. Janet Pien, City of Madison, Eng. Division (pdf only)
Mr. Dennis Cawley, Madison Water Utility

APPENDIX A

**SOIL BORING LOCATION MAP
LOGS OF TEST BORINGS (3)
LOG OF TEST BORING-GENERAL NOTES
UNIFIED SOIL CLASSIFICATION SYSTEM**



Notes

1. Soil borings drilled by Badger State Drilling in February 2009

Legend

- Denotes Boring Location (approximate)



SOIL BORING LOCATION MAP
 Mid Town Road
 Madison, Wisconsin

CGC, Inc.

DWN: -	APP'D: MNS	Date: 2/09	C09028-1
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LOG OF TEST BORING

Project Mid Town Road
 Location Madison, Wisconsin

Boring No. 1
 Surface Elevation (ft) _____
 Job No. C09028-1
 Sheet 1 of 1

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

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL
					5"	5" Asphalt Pavement/4" Base Course				
1X 1		10	M	42*	5"	Stiff, Brown lean CLAY, Little Sand (CL)				
					10"	Dense to Medium Dense, Brown Fine to Medium SAND, Some Gravel, Little Silt (SP-SM)				
2		10	M	44						
3		14	M	26						
4		13	M	34	10"	Dense to Very Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles (SM)				
5		16	M	47	15"					
6		18	M	54	20"					
7		18	M	75	25"					
End Boring at 25 ft										
Borehole backfilled with bentonite chips										
*Sample 1 partially frozen										

WATER LEVEL OBSERVATIONS	GENERAL NOTES
While Drilling <input checked="" type="checkbox"/> NW Upon Completion of Drilling _____ Time After Drilling _____ <u>1/4 hr</u> Depth to Water _____ <u>NW</u> ▼ Depth to Cave in _____	Start <u>2/12/09</u> End <u>2/12/09</u> Driller <u>Badger</u> Chief <u>JR</u> Rig <u>CME-55</u> Logger <u>RM</u> Editor <u>ESF</u> Drill Method <u>2 1/4" HSA</u>
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.	



LOG OF TEST BORING

Project Mid Town Road
 Location Madison, Wisconsin

Boring No. 2
 Surface Elevation (ft) _____
 Job No. C09028-1
 Sheet 1 of 1

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

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	P200
					3" Asphalt Pavement/4" Base Course					
1	14	M	69*		Dark Brown to Black Lean to Organic CLAY (CL/OL) (Possible Fill)		20.5			4.0
2	18	M	26	5	Stiff, Dark Gray-Brown Lean CLAY, Trace Sand and Gravel (CL)	(1.25)				
3	14	M	10		Very Stiff, Gray Mottled Lean CLAY, Trace Sand (CL)	(2.5)				
4	18	M	7	10	Medium to Stiff to Very Soft, Gray-Green Mottled Lean CLAY, Trace Organics (CL)	(<0.25-0.75)				
					End Boring at 10 ft					
					Borehole backfilled with bentonite chips					
					*Sample 1 frozen					

WATER LEVEL OBSERVATIONS	GENERAL NOTES
While Drilling <input checked="" type="checkbox"/> <u>NW</u> Upon Completion of Drilling _____ Time After Drilling _____ <u>1/4 hr</u> Depth to Water _____ <u>NW</u> <input checked="" type="checkbox"/> Depth to Cave in _____	Start <u>2/12/09</u> End <u>2/12/09</u> Driller <u>Badger</u> Chief <u>JR</u> Rig <u>CME-55</u> Logger <u>RM</u> Editor <u>ESF</u> Drill Method <u>2 1/4" HSA</u>
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.	



LOG OF TEST BORING

Project Mid Town Road
 Location Madison, Wisconsin

Boring No. 3
 Surface Elevation (ft) _____
 Job No. C09028-1
 Sheet 1 of 1

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

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	P200
					3" Asphalt/4" Base Course					
1	14	M	56*		Dark Brown to Black Lean to Orgainc CLAY (CL/OL) (Possible Buried Topsoil)		24.6		5.2	
2	18	M	11		Very Stiff at 4 ft	(3.0)				
3	18	M	18		Very Stiff, Gray Lean CLAY, Trace Sand (CL)	(3.0)				
4	18	W/M	4		Soft to Medium Stiff, Gray Mottled Lean CLAY, Trace Sand (CL)	(0.5-0.75)				
5	16	M	15		Medium Dense, Brown Clayey Fine to Medium SAND, Little Gravel (SC)					
					Very Soft, Brown Lean CLAY, Some Sand (CL)					
6	16	W	5			(<0.25)				
					End Boring at 20 ft					
					Borehole backfilled with bentonite chips					
					*Sample 1 frozen					

WATER LEVEL OBSERVATIONS

While Drilling ∇ 18.0' Upon Completion of Drilling _____
 Time After Drilling _____ 1/4 hr
 Depth to Water _____ 17.5' ∇
 Depth to Cave in _____ 18.0'

GENERAL NOTES

Start 2/12/09 End 2/12/09
 Driller Badger Chief JR Rig CME-55
 Logger RM Editor ESF
 Drill Method 2 1/4" HSA

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

CGC, Inc.

LOG OF TEST BORING

General Notes

Descriptive Soil Classification

GRAIN SIZE TERMINOLOGY

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

Plasticity characteristics differentiate between silt and clay.

GENERAL TERMINOLOGY

Physical Characteristics
Color, moisture, grain shape, fineness, etc.

Major Constituents
Clay, silt, sand, gravel

Structure
Laminated, varved, fibrous, stratified, cemented, fissured, etc.

Geologic Origin
Glacial, alluvial, eolian, residual, etc.

RELATIVE DENSITY

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

RELATIVE PROPORTIONS OF OF COHESIONLESS SOILS

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

CONSISTENCY

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

ORGANIC CONTENT BY COMBUSTION METHOD

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

PLASTICITY

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

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

SYMBOLS

DRILLING AND SAMPLING

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

LABORATORY TESTS

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

WATER LEVEL MEASUREMENT

▽ --Water Level at time shown
NW--No Water Encountered
WD--While Drilling
BCR--Before Casing Removal
ACR--After Casing Removal
CW--Caved and Wet
CM--Caved and Moist

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

UNIFIED SOIL CLASSIFICATION SYSTEM

COARSE-GRAINED SOILS

(More than half of material is larger than No. 200 sieve size.)

GRAVELS More than half of coarse fraction larger than No. 4 sieve size	Clean Gravels (Little or no fines)	
	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
	GP	Poorly graded gravels, gravel-sand mixtures, little or no fines
	Gravels with Fines (Appreciable amount of fines)	
	GM_u^d	Silty gravels, gravel-sand-silt mixtures
	GC	Clayey gravels, gravel-sand-clay mixtures
SANDS More than half of coarse fraction smaller than No. 4 sieve size	Clean Sands (Little or no fines)	
	SW	Well-graded sands, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with Fines (Appreciable amount of fines)	
	SM_u^d	Silty sands, sand-silt mixtures
	SC	Clayey sands, sand-clay mixtures

FINE-GRAINED SOILS

(More than half of material is smaller than No. 200 sieve.)

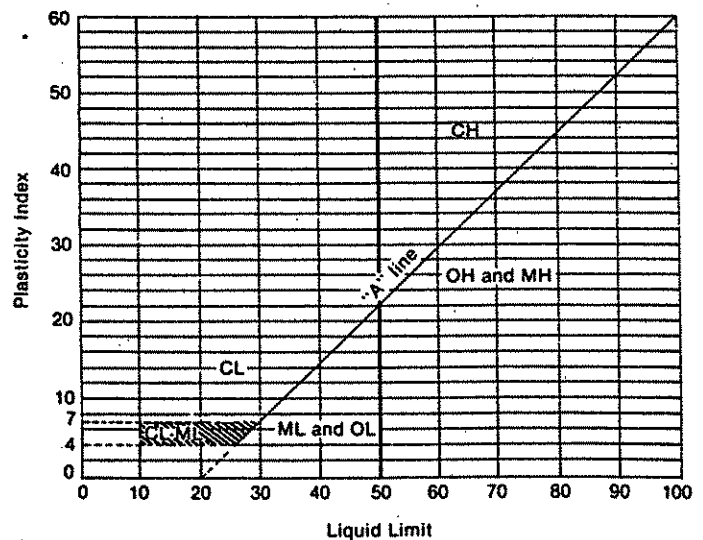
SILTS AND CLAYS Liquid limit less than 50%	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit greater than 50%	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils

LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for SW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in hatched zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:
 Less than 5 per cent GW, GP, SW, SP
 More than 12 per cent GM, GC, SM, SC
 5 to 12 per cent Borderline cases requiring dual symbols

PLASTICITY CHART



For classification of fine-grained soils and fine fraction of coarse-grained soils.
 Atterberg Limits plotting in hatched area are borderline classifications requiring use of dual symbols.
 Equation of A-line: $PI = 0.73 (LL - 20)$

APPENDIX B

RECOMMENDED COMPACTED FILL SPECIFICATIONS

APPENDIX B

CGC, INC.

RECOMMENDED COMPACTED FILL SPECIFICATIONS

Fill Materials

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

Placement Method

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

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

Compaction Specifications

Maximum dry density and optimum moisture content of the fill soil shall be determined in accordance with modified Proctor methods (ASTM D1557). The recommended field compaction as a percentage of the maximum dry density is shown in Table 1.

Table 1
Compaction Guidelines

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

NOTES:

⁺ Based on Modified Proctor (ASTM D 1557)

Testing Procedures

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

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

APPENDIX C
DOCUMENT QUALIFICATIONS

APPENDIX C

DOCUMENT QUALIFICATIONS

I. GENERAL RECOMMENDATIONS/LIMITATIONS

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

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

II. IMPORTANT INFORMATION

ABOUT YOUR

GEOTECHNICAL ENGINEERING REPORT

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

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

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

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

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

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

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

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

SUBSURFACE CONDITIONS CAN CHANGE

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

MOST GEOTECHNICAL FINDINGS ARE PROFESSIONAL OPINIONS

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

A REPORT'S RECOMMENDATIONS ARE NOT FINAL

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

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

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

DO NOT REDRAW THE ENGINEER'S LOGS

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

GIVE CONTRACTORS A COMPLETE REPORT AND GUIDANCE

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

READ RESPONSIBILITY PROVISIONS CLOSELY

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

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

GEOENVIRONMENTAL CONCERNS ARE NOT COVERED

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

RELY ON YOUR GEOTECHNICAL ENGINEER FOR ADDITIONAL ASSISTANCE

Membership in ASFE exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with CGC, a member of ASFE, for more information.

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ASFE
8811 Colesville Road, Suite G 106
Silver Spring, MD 20910

SECTION E: PROPOSAL

**LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER
CONTRACT NO. 6329**

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 - 2009 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.
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. Accompanying this Proposal is Bid Bond or Certified Check in the amount of _____ Dollars (\$ _____) or a Certificate of Biennial Bid Bond as required by the Advertisement for Bids.
(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.

**LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER
CONTRACT NO. 6329**

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

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)

**LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER
CONTRACT NO. 6329**

Best Value Contracting

1. The Contractor shall indicate the non-apprenticeable trades used on this contract.

2. Some Contractors are exempt due to the size of the work force. Apprenticeable trades are those trades considered apprenticeable by the State of Wisconsin.

Check Here if the Contractor has a total skilled work force of four or less individuals in all apprenticeable trades combined. This contractor is exempt from Best Value Contracting.

3. The Contractor shall indicate on page E-4 which apprenticeable trades are to be used on this Contract and shall indicate by checking the appropriate box for the trades used, how the contractor will comply with Madison General Ordinance 33.07(7).

Legend

Number of Journeyworkers	The Contractor shall indicated for trades to be used on this Contract only, the number of journeyworkers that the Contractor has employed company wide.
W-ATT	The Contractor is an active trade trainer in the State of Wisconsin for the trade indicated.
US-ATT	The Contractor is an active trade trainer in an apprenticeship program approved by the U.S. Department of Labor or another state apprenticeship agency in the trade indicated.
SB-ATT	The Contractor shall become an active trade trainer prior to beginning work on the Contract in the trade indicated.

The Contractor has reviewed the list on page E-4 and shall not use any apprenticeable trades on this project.

The Contractor has reviewed this list on E-4 and has checked the appropriate box by each apprenticeable trade to be used on the project.

**LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER
CONTRACT NO. 6329**

Apprenticeable Trades

Check the box in the column "Trade Used on This Project" for each apprenticeable trades used on this project. For those trades used on the project indicated the number of journeyworkers that are employed company wide and check a box to the right of the trade as to how the Contractor will comply MGO 33.07(7). Refer to the legend on page E-3 for the meaning associated with each heading. The Contractor must check one of the boxes on the right for each apprenticeable trade used and checked on the left.

Trade Used on Contract	Apprenticeable Trades	Number of Journeyworkers	W-ATT	US-ATT	SB-ATT
<input type="checkbox"/>	Bricklayer		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Carpenter		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Cement Mason / Concrete Finisher		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Cement Mason (Heavy Highway)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Construction Craft Laborer		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Data Communication Installer		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Electrician		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Environmental Systems Technician / HVAC Service Tech/HVAC Install / Service		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Glazier		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Heavy Equipment Operator / Operating Engineer		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Insulation Worker (Heat & Frost)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Iron Worker		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Iron Worker (Assembler, Metal Bldgs)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Painter & Decorator		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Plasterer		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Plumber		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Residential Electrician		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Roofer & Waterproofer		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Sheet Metal Worker		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Sprinklerfitter		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Steamfitter		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Steamfitter (Refrigeration)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Steamfitter (Service)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Taper & Finisher		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Telecommunications (Voice, Data & Video) Installer-Technician		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Tile Setter		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PROPOSAL

NAME OF BIDDER

LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER

CONTRACT NO. 6329

ITEM	TYPE OF WORK	ESTIMATED QUANTITIES		UNIT PRICE BID	TOTAL BID
ACCOUNT NO. ES01-58275-810550-00-53W0789					
10704	TRAFFIC CONTROL FOR SANITARY SEWER INSTALLATION	1.00	L.S.		
10914	MOBILIZATION FOR SANITARY SEWER INSTALLATION	1.00	L.S.		
20109	FINISH GRADING	1.00	L.S.		
20217	CLEAR STONE 3"	150.00	Ton		
20221	TOPSOIL 4"	2,685.00	S.Y.		
20314	REMOVE PIPE - STORM	168.00	L.F.		
20315	REMOVE PIPE - SANITARY	50.00	L.F.		
20322	REMOVE CONCRETE CURB AND GUTTER	280.00	L.F.		
20323	REMOVE CONCRETE SIDEWALK AND DRIVE	593.00	S.F.		
20335	ABANDON SEWER PIPE WITH SLURRY	2.00	C.Y.		
20336	PIPE PLUGS	6.00	Each		
20701	SUN TERRACE SEEDING	2,685.00	S.Y.		
21001	SILT FENCE COMPLETE	2,096.00	L.F.		
21004	EROSION MATTING, CLASS 1, TYPE B	2,685.00	S.Y.		
21013	CLEAR STONE BERM FOR EROSION CONTROL	4.00	Each		
21014	CONSTRUCTION ENTRANCE	2.00	Each		
21017	INLET PROTECTION TYPE 'D'	6.00	Each		
30201	TYPE 'A' CONCRETE CURB AND GUTTER	280.00	L.F.		
30301	5 INCH CONCRETE SIDEWALK	493.00	S.F.		
30401	RESET MONUMENT	1.00	Each		

LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER

CONTRACT NO. 6329

ITEM	TYPE OF WORK	ESTIMATED QUANTITIES		UNIT PRICE BID	TOTAL BID
50201	ROCK EXCAVATION (undistributed)	50.00	C.Y.		
50202	TYPE II DEWATERING	1.00	L.S.		
50211	SELECT BACKFILL FOR STORM SEWER	94.00	T.F.		
50212	SELECT BACKFILL FOR SANITARY SEWER	2,436.00	T.F.		
50303	12" PVC SANITARY SEWER SDR- 35/SDR-26	1,215.00	L.F.		
50308	27" PVC SANITARY SEWER PIPE	78.00	L.F.		
50361	WASTEWATER CONTROL	1.00	L.S.		
50370	TRACER WIRE AND BOX	1,143.00	L.F.		
50390	SEWER ELECTRONIC MARKER BALLS	2.00	Each		
50413	18 INCH RCP STORM SEWER PIPE	20.00	L.F.		
50434	29 INCH X45 INCH HERCP STORM SEWER PIPE	74.00	L.F.		
50499	CONCRETE COLLAR	2.00	Each		
50701	4' DIAMETER SANITARY SAS	7.00	Each		
50771	INTERNAL CHIMNEY SEALS	3.00	Each		
50793	12 INCH SANITARY SEWER OUTSIDE DROP(12")	9.00	V.F.		
50801	UTILITY LINE OPENING(UNDISTRIBUTED)	2.00	Each		
90001	HACKBERRY	1.00	Each		
90002	MULTI STEM SERVICE BERRY	2.00	Each		
90070	ABANDON LIFT STATION	1.00	L.S.		
90071	SANITARY SEWER FORCE MAIN- 10" PVC	1,143.00	L.F.		
90072	SANITARY SEWER LIFT STATION	1.00	L.S.		
90073	SALVAGED TOPSOIL	375.00	S.Y.		
90170	PAVEMENT MARKING EPOXY, 4- INCH, DOUBLE YELLOW	900.00	L.F.		

LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER

CONTRACT NO. 6329

ITEM	TYPE OF WORK	ESTIMATED QUANTITIES	UNIT PRICE BID	TOTAL BID
ACCOUNT NO. ES01-58260-810550-00-53W0789 (50%)				
ACCOUNT NO. CS53-58260-810358-00-53W0789 (50%)				
20101	EXCAVATION CUT	2,316.00	C.Y.	
20140	GEOTEXTILE FABRIC TYPE SAS NON WOVEN	860.00	S.Y.	
20219	BREAKER RUN (UNDISTRIBUTED UNDERCUT)	1,676.00	Ton	
20303	SAWCUT BITUMINOUS PAVEMENT	148.00	L.F.	
40101	CRUSHED AGGREGATE BASE COARSE (GRADATION 1)	1,226.00	Ton	
40102	CRUSHED AGGREGATE BASE COARSE (GRADATION 2 & 3)	1,300.00	Ton	
40202	HMA Pavement TYPE E-1.0	800.00	Ton	
40211	TACK COAT	156.00	gal	

GRAND TOTAL

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SECTION F: 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:

LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER CONTRACT NO. 6329

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 <p style="text-align: center;">City of Madison, Wisconsin</p>

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 G: AGREEMENT

THIS AGREEMENT made this _____ day of _____ in the year Two Thousand and Nine 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 _____, 2009, 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:

LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER CONTRACT NO. 6329

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 comply with Section 23.01(1) of Madison General Ordinances entitled "Wage Rates for Employees of Public Works Contracts." 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.

This provision shall apply to all contracts for public works regardless of any exclusions contained in Wisconsin Statutes, including Sec. 66.0903(5), based on the value of the contract, number of trades involved, or type of work.

"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 substantially in place, directly or through spreaders, 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 preapprentices, 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 City of Madison has been granted exemption from applying to the Wisconsin Department of Workforce Development (DWD) for determination of prevailing wage rates in accordance with Sec. 66.0903(3), Wis. Stats. 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. Upon approval by the Common Council, 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 be paid unconditionally and not less often than once per week. 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 Subjourneypersons. Apprentices and subjourneypersons 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 and Sec. 23.01, Madison General Ordinances; 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 therefor; 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., and Sec. 23.01, Madison General Ordinances, 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 therefor; 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 or this ordinance, 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 of Madison Department of Affirmative Action 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 Department of Affirmative Action 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 of Madison Department of Affirmative Action 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 Department of Affirmative Action 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 3.58(9)(f) of the Madison General Ordinances and will provide the City's Department of Affirmative Action with access to such records and to persons who have relevant and necessary information, as provided in Section 3.58(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 3.23 and 3.58 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.

**LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER
CONTRACT NO. 6329**

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
Witness	Date
	President
	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:

City Comptroller	City Attorney
Signed this _____ day of _____, 20_____	
Witness	Mayor
	Date
Witness	City Clerk
	Date

SECTION H: 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:

**LOWER BADGER MILL CREEK LIFT STATION, FORCE MAIN & SANITARY SEWER
CONTRACT NO. 6329**

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 _____, 2009

Countersigned:

Company Name (Principal)

Witness

President Seal

Secretary

Approved as to form:

Surety Seal

Salary Employee Commission

City Attorney

By _____
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

Jim Doyle
Governor
Róberta Gassman
Secretary
Jennifer A. Ortiz
Division Administrator



State of Wisconsin
Department of Workforce Development

EQUAL RIGHTS DIVISION
201 East Washington Avenue, Room A300
P.O. Box 8928
Madison, WI 53708
Telephone: (608) 266-6860
Fax: (608) 267-4592
TTY: (608) 264-8752
<http://www.dwd.state.wi.us/>

May 12, 2009

NOTICE CORRECTING
WAGE RATE DETERMINATION

LARRY D. NELSON, PE, CITY ENGINEER
CITY OF MADISON
210 MARTIN LUTHER KING JR BLVD, RM
MADISON, WI 53703

RE: All Public Works Construction Projects Subject to s. 66.0903, Stats.
City of Madison, Dane County, WI
Determination No. 200900005 Project No. None

This is to advise you that an error(s) was made in the above referenced determination when it was issued to you on January 2, 2009. One or more of the prevailing wage rates are incorrect as issued. A corrected copy of Determination No. 200900005 is enclosed.

The prevailing wage rate(s) specified in Determination No. 200900005, as corrected on this date, is to be considered as prevailing for this project in accordance with the provisions of s. 66.0903, Stats., and Chapt. DWD 290 of the Wisconsin Administrative Code.

All of the prevailing wage rates specified in the determination, as corrected, remain subject to further review as detailed in the Departmental Order that was issued to you for this project on January 2, 2009.

All prospective bidders should be furnished with a copy of the corrected portion of the determination.

Please call me at (608) 266-3148 if you have any questions regarding this matter.

Sincerely,

LABOR STANDARDS BUREAU

A handwritten signature in black ink, appearing to read 'Julie Eckenwalder'.

Julie Eckenwalder, Chief
Construction Wage Standards Section

Enclosure

C: Norman Davis

**NOTICE CORRECTING WAGE RATE DETERMINATION
DATED MAY 12, 2009
For all exempt public entities**

The corrections on this determination involve a change in the premium language and a small number of rates and may appear in:

BUILDING OR HEAVY CONSTRUCTION
Landscaper

SEWER, WATER OR TUNNEL CONSTRUCTION
Heavy Equipment Operator – Truck Mounted Hydraulic Crane...

AIRPORT PAVEMENT OR STATE HIGHWAY CONSTRUCTION
General Laborer
Landscaper
Flagperson or Traffic Control
Heavy Equipment Operator - Crane, Tower Crane or Derrick...with a lifting capacity of 100 tons or under,...
Heavy Equipment Operator – Farm or Industrial Type Tractor...

LOCAL STREET OR MISCELLANEOUS PAVING CONSTRUCTION
Landscaper
Flagperson or Traffic Control
Heavy Equipment Operator – Crane, Tower Crane or Derrick...with a lifting capacity of over 100 tons....
Heavy Equipment Operator – Crane, Tower Crane or Derrick...with a lifting capacity of 100 tons or under,...
Heavy Equipment Operator – Backhoe (Track Type),...
Heavy Equipment Operator – Farm or Industrial Type Tractor,...

PREVAILING WAGE RATE DETERMINATION

Issued by the State of Wisconsin
 Department of Workforce Development
 Pursuant to s. 66.0903, Stats.
 Issued On: 1/02/2009
 Corrected On: 2/02/2009
 Corrected On: 5/12/2009
 Corrected On: 3/24/2009
 Corrected On: 1/16/2009
 Corrected On: 2/09/2009

DETERMINATION NUMBER: 200900005

EXPIRATION DATE: Prime Contracts MUST Be Awarded Or Negotiated On Or Before 12/31/2009. If NOT, You MUST Reapply.

DESCRIPTION OF PROJECT: All Public Works Construction Projects Subject to s. 66.0903, Stats.
 PROJECT NO: None

LOCATION OF PROJECT: City of Madison, Dane County, WI

CONTRACTING AGENCY: CITY OF MADISON

CLASSIFICATION: Contractors are required to call the Department of Workforce Development if there are any questions regarding the proper trade or classification to be used for any worker on a public works project.

OVERTIME: Time and one-half must be paid for all hours worked over 10 hours per day and 40 hours per calendar week and for all hours worked on Saturday, Sunday and the following six (6) 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.

FUTURE INCREASE: If indicated for a specific trade or occupation, the full amount of such increase MUST be added to the "TOTAL" indicated for such trade or occupation on the date(s) such increase(s) becomes effective.

PREMIUM PAY: If indicated for a specific trade or occupation, the full amount of such pay MUST be added to the "HOURLY BASIC RATE OF PAY" indicated for such trade or occupation, whenever such pay is applicable.

SUBJOURNEY: Wage rates may be available for some of the classifications indicated below with the exception of laborers, truck drivers and heavy equipment operators. Any employer that desires to use any subjourney classification on this project MUST request the applicable wage rate from this department PRIOR to the date such classification is used on this project. Form ERD-10880 is available for this purpose.

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.

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$
Acoustic Ceiling Tile Installer Future Increase(s): Add \$2.25/hr on 6/1/2009; Add \$2.25/hr on 5/31/2010.	27.51	13.48	40.99
Boilermaker	30.69	16.87	47.56
Bricklayer, Blocklayer or Stonemason Future Increase(s): Add \$1.90 06/01/2009; Add \$1.95 05/31/2010.	30.61	14.10	44.71
Cabinet Installer	24.10	0.00	24.10

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked			
<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$
Carpenter	27.51	13.48	40.99
Future Increase(s): Add \$2.25/hr on 6/1/2009; Add \$2.25/hr on 5/31/2010.			
Carpet Layer or Soft Floor Coverer	27.51	13.48	40.99
Future Increase(s): Add \$2.25/hr on 6/1/2009; Add \$2.25/hr on 5/31/2010.			
Cement Finisher	28.43	12.94	41.37
Drywall Taper or Finisher	25.30	12.15	37.45
Future Increase(s): Add \$1.60/hr on 6/1/09			
Electrician	31.00	16.80	47.80
Future Increase(s): Add \$1.70/hr on 6/1/2009; Add \$1.70/hr on 6/1/2010.			
Elevator Constructor	42.73	16.47	59.20
Fence Erector	17.35	2.32	19.67
Fire Sprinkler Fitter	35.69	14.27	49.96
Glazier	34.48	7.17	41.65
Heat or Frost Insulator	30.63	16.66	47.29
Insulator (Batt or Blown)	22.07	11.30	33.37
Ironworker	30.30	15.77	46.07
Future Increase(s): Add \$2/hr on 6/1/2009; Add \$2/hr on 6/1/2010.			
Lather	26.11	12.86	38.97
Line Constructor (Electrical)	33.08	14.68	47.76
Marble Finisher	25.28	14.10	39.38
Marble Mason	31.60	14.10	45.70
Metal Building Erector	29.30	14.71	44.01
Millwright	29.11	13.48	42.59
Future Increase(s): Add \$2.25/hr on 6/1/2009; Add \$2.25/hr on 5/31/2010.			
Overhead Door Installer	25.04	13.01	38.05
Painter	25.00	12.15	37.15
Future Increase(s): Add \$1.60 on 6/1/09			
Premium Pay: Add \$.25/hr. sandblasting; Add \$.40/hr. paperhanging; Add \$1.00/hr. spray/structural steel.			
Pavement Marking Operator	23.40	6.15	29.55
Piledriver	28.01	13.48	41.49
Future Increase(s): Add \$2.25/hr on 6/1/2009; Add \$2.25/hr on 5/31/2010.			
Pipeline Fuser or Welder (Gas or Utility)	29.58	14.64	44.22
Plasterer	25.28	12.91	38.19
Plumber	34.78	12.76	47.54
Refrigeration Mechanic	36.55	13.41	49.96
Future Increase(s): Add \$2.85/hr on 6/01/2009.			
Roofer or Waterproofer	27.85	7.51	35.36
Sheet Metal Worker	32.01	17.79	49.80
Steamfitter	36.55	13.41	49.96
Future Increase(s): Add \$2.85/hr on 6/01/2009.			
Teledata Technician or Installer	21.08	10.68	31.76
Future Increase(s): Add \$.90 on 6/1/09.			
Temperature Control Installer	35.25	11.64	46.89
Terrazzo Finisher	27.98	13.20	41.18
Terrazzo Mechanic	29.46	13.41	42.87

Fringe Benefits Must Be Paid On All Hours Worked

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$
Tile Finisher Future Increase(s): Add \$1.65/hr on 6/01/2009; Add \$1.65/hr on 5/31/2010.	22.93	13.45	36.38
Tile Setter Future Increase(s): Add \$1.65 06/01/2009; Add \$1.65 05/31/2010	28.66	13.45	42.11
Tuckpointer, Caulker or Cleaner Future Increase(s): Add \$1.90 6/01/2009; Add \$1.95 05/31/2010	30.61	14.10	44.71
Underwater Diver (Except on Great Lakes)	33.50	11.84	45.34
Well Driller or Pump Installer	22.52	13.68	36.20
Siding Installer	24.75	9.18	33.93
Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	25.22	12.05	37.27
Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY	29.12	16.00	45.12
Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	16.00	8.00	24.00
Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	21.50	11.00	32.50
Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	18.19	10.04	28.23

TRUCK DRIVERS

Single Axle or Two Axle	17.00	0.66	17.66
Three or More Axle	17.50	11.83	29.33
Articulated, Euclid, Dumptor, Off Road Material Hauler Future Increase(s): Add \$1.75/hr on 6/1/2009; Add \$1.80/hr on 6/1/2010.	29.89	16.41	46.30
Pavement Marking Vehicle	20.06	11.55	31.61
Truck Mechanic	19.00	11.14	30.14

LABORERS

General Laborer Future Increase(s): Add \$1.60/hr on 6/1/2009; Add \$1.65/hr on 5/31/2010 Premium Pay: Add \$1.00/hr for certified welder; Add \$.25/hr for mason tender	22.59	11.75	34.34
Asbestos Abatement Worker	22.06	12.40	34.46
Landscaper	23.25	5.38	28.63
Gas or Utility Pipeline Laborer (Other Than Sewer and Water)	24.67	11.87	36.54
Fiber Optic Laborer (Outside, Other Than Concrete Encased)	17.06	12.65	29.71
Railroad Track Laborer	20.96	11.95	32.91

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

Crane; Backhoe (Track Type); Tractor or Truck Mounted Hydraulic Backhoe; Gradall (Cruz-Aire Type); Mechanic or Welder; Bulldozer or Endloader; Grader or Motor Patrol; Scraper (Self Propelled or Tractor Drawn) 5cu yards or more capacity; Power Subgrader; Asphalt Milling Machine; Boring Machine (Horizontal, Vertical or Directional); Air Track, Rotary or Percussion Drilling Machine; Trencher; Post Hole Digger or Driver; Tug or Launch (not performing work on the Great Lakes)	28.59	16.45	45.04
Farm or Industrial Type Tractor; Greaser; Compactor (Self-Propelled); Broom or Sweeper; Environmental Burner	29.89	16.41	46.30

Fringe Benefits Must Be Paid On All Hours Worked

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$
Future Increase(s): Add \$1.75/hr on 6/1/2009; Add \$1.80/hr on 6/1/2010.			
Crusher, Screening or Wash Plant; Air Compressor (400 CFM or Over); Pump (3 Inch or Over) or Well Points; Refrigeration Plant or Freeze Machine; Skid Steer Loader (With or Without Attachments); Skid Rig; Stump Chipper; Mulcher; Vibratory Hammer or Extractor	26.52	17.08	43.60

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

Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 176 Feet or Over Future Increase(s): Add \$2.00/hr on 6/1/2009; Add \$2.05 on 6/1/2010. Premium Pay: Add \$.50/hr for cranes with lifting capacity over 200 ton; Add \$1.00/hr. at 300 ton; Add \$1.50/hr at 400 ton; Add \$2.00/hr at 500 ton.	32.12	16.41	48.53
Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 175 Feet or Under; Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of 130,000 Lbs. or Over; Traveling Crane (Bridge Type); Caisson Rig; Pile Driver; Dredge (Not Performing Work on the Great Lakes) Future Increase(s): Add \$2.00/hr on 6/1/2009; Add \$2.05/hr on 6/1/2010. Premium Pay: Add \$.25/hr for cranes with lifting capacity of 45 ton or over.	31.12	16.41	47.53
Crane (Go-Devil Type) or Truck Mounted Hydraulic Crane (10 Tons or Under); Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of Under 130,000 Lbs.; Tractor or Truck Mounted Hydraulic Backhoe; Gradall (Cruz-Aire Type); Mechanic or Welder; Bulldozer or Endloader; Grader or Motor Patrol; Scraper (Self Propelled or Tractor Drawn) 5 cu yards or more capacity; Concrete Pump, Grout Pump or Concrete Conveyor (Rotec or Bidwell Type); Concrete Breaker (Manual or Remote); Concrete Batch Plant; Power Subgrader; Concrete Spreader; Concrete Paver; Concrete Grinder or Planing Machine; Concrete Conveyor System; Concrete Slipform Placer; Curb and Gutter Machine; Roller (Over 5 Ton); Shouldering Machine; Boring Machine (Horizontal, Vertical or Directional); Air Track, Rotary or Percussion Drilling Machine; Straddle Carrier or Travel Lift; Forklift (Machinery Moving or Steel Erection); Manhoist or Elevator; Material or Stack Hoist; Trencher; Sideboom; Hydro-Blaster (10,000 PSI or Over); Post Hole Digger or Driver; Railroad Track Rail Leveling Machine, Tie Placer, Extractor, Tamper, Stone Leveler or Rehabilitation Equipment Future Increase(s): Add \$1.75/hr on 6/1/2009; Add \$1.80/hr on 6/1/2010.	30.42	16.41	46.83
Farm or Industrial Type Tractor; Greaser; Compactor (Self-Propelled); Concrete Saw (Vermeer Type); Concrete Bump Cutter or Grooving Machine; Tining or Curing Machine; Roller (5 Tons or Under); Broom or Sweeper; Hoist (Tugger); Environmental Burner	23.40	6.15	29.55
Crusher, Screening or Wash Plant; Air, Electric or Hydraulic Jacking System; Air Compressor (400 CFM or Over); Generator (150 KW or Over); Pump (3 Inch or Over) or Well Points; Refrigeration Plant or Freeze Machine; Skid Steer Loader (With or Without Attachments); Robotic Tool Carrier (With or Without Attachments); Skid Rig; Stump Chipper; Mulcher; Vibratory Hammer or Extractor	30.60	7.73	38.33
Oiler; Forklift	27.19	16.41	43.60

Fringe Benefits Must Be Paid On All Hours Worked

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$
Future Increase(s): Add \$1.75/hr on 6/1/2009; Add \$1.80/hr on 6/1/2010.			
Gas or Utility Pipeline, Except Sewer and Water (Primary Equipment)	34.01	17.23	51.24
Gas or Utility Pipeline, Except Sewer and Water (Secondary Equipment)	27.12	15.80	42.92
Future Increase(s): Add \$1.60/hr on 6/1/2009; Add \$1.60/hr on 6/1/2010; Add \$1.60/hr on 6/1/2011.			
Fiber Optic Cable Equipment	21.84	14.55	36.39

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).

Bricklayer, Blocklayer or Stonemason	29.46	13.41	42.87
Carpenter	27.51	13.48	40.99
Future Increase(s): Add \$2.25/hr on 6/1/2009; Add \$2.25/hr on 5/31/2010.			
Cement Finisher	27.00	12.83	39.83
Electrician	28.34	15.48	43.82
Fence Erector	17.35	2.32	19.67
Ironworker	29.30	14.71	44.01
Line Constructor (Electrical)	33.08	14.68	47.76
Pavement Marking Operator	23.40	6.15	29.55
Piledriver	26.61	12.86	39.47
Plumber	26.00	14.00	40.00
Steamfitter	35.25	12.11	47.36
Teledata Technician or Installer	20.69	10.23	30.92
Tuckpointer, Caulker or Cleaner	29.46	13.41	42.87
Underwater Diver (Except on Great Lakes)	33.50	11.84	45.34
Well Driller or Pump Installer	22.52	13.68	36.20
Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	25.22	12.05	37.27
Light Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	29.12	16.00	45.12
Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	16.00	8.00	24.00
Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	21.50	11.00	32.50
Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	18.19	10.04	28.23

TRUCK DRIVERS

Single Axle or Two Axle	17.75	2.92	20.67
Three or More Axle	23.28	15.35	38.63
Articulated, Euclid, Dumptor, Off Road Material Hauler	28.59	16.00	44.59
Pavement Marking Vehicle	20.06	11.55	31.61
Truck Mechanic	19.00	11.14	30.14

LABORERS

General Laborer	24.08	11.74	35.82
Future Increase(s): Add \$1.45/hr on 6/1/2009; Add \$1.45/hr on 6/7/2010; Add \$1.45/hr on 6/6/2011.			
Premium Pay: 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;			

Fringe Benefits Must Be Paid On All Hours Worked

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$
Add \$3.00 for over 30 lbs. compressed air.			
Landscaper	23.28	11.14	34.42
Flagperson or Traffic Control Person	18.55	12.20	30.75
Fiber Optic Laborer (Outside, Other Than Concrete Encased)	16.58	12.00	28.58
Railroad Track Laborer	20.96	11.95	32.91

HEAVY EQUIPMENT OPERATORS

Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 176 Feet or Over; Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of 130,000 Lbs. or Over Future Increase(s): Add \$1.70/hr on 6/1/2009; Add \$1.70/hr on 6/1/2010; Add \$1.90/hr on 6/6/2011; Add \$2.05/hr on 6/4/2012.	31.39	16.55	47.94
Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 175 Feet or Under; Traveling Crane (Bridge Type); Caisson Rig; Pile Driver; Dredge (Not Performing Work on the Great Lakes); Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of Under 130,000 Lbs. Future Increase(s): Add \$1.75/hr on 6/1/2009; Add \$1.80/hr on 6/1/2010.	30.42	16.41	46.83
Truck Mounted Hydraulic Crane (10 Tons or Under); Tractor or Truck Mounted Hydraulic Backhoe; Gradall (Cruz-Aire Type); Mechanic or Welder; Bulldozer or Endloader; Grader or Motor Patrol; Concrete Pump, Grout Pump, or Concrete Conveyor (Rotec or Bidwell Type); Concrete Breaker (Manual or Remote); Concrete Batch Plant; Power Subgrader; Concrete Spreader; Concrete Paver; Concrete Grinder or Planing Machine; Concrete Conveyor System; Concrete Slipform Placer; Curb and Gutter Machine; Roller (Over 5 Ton); Shouldering Machine; Boring Machine (Horizontal, Vertical or Directional); Air Track, Rotary or Percussion Drilling Machine; Straddle Carrier or Travel Lift; Manhoist or Elevator; Material or Stack Hoist; Trencher; Sideboom; Post Hole Digger or Driver; Tug or Launch (Not Performing Work on the Great Lakes) Future Increase(s): Add \$1.75/hr on 6/1/2009; Add \$1.80/hr on 6/1/2010.	29.89	16.41	46.30
Farm or Industrial Type Tractor; Greaser; Compactor (Self-Propelled); Concrete Saw (Vermeer Type); Concrete Bump Cutter or Grooving Machine; Tining or Curing Machine; Roller (5 Ton or Under); Broom or Sweeper; Hoist (Tugger); Environmental Burner	28.56	15.79	44.35
Crusher, Screening or Wash Plant; Air, Electric or Hydraulic Jacking System; Air Compressor (400 CFM or Over); Generator (150 KW or Over); Pump (3 Inch or Over) or Well Points; Refrigeration Plant or Freeze Machine; Skid Steer Loader (With or Without Attachments); Robotic Tool Carrier (With or Without Attachments); Skid Rig; Stump Chipper; Mulcher; Vibratory Hammer or Extractor; High Pressure Utility Locating Machine (daylighting machine).	28.56	15.35	43.91
Oiler; Forklift	28.97	15.95	44.92

Fringe Benefits Must Be Paid On All Hours Worked

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$
AIRPORT PAVEMENT OR STATE HIGHWAY CONSTRUCTION: Includes all airport projects (excluding buildings) and all projects awarded by the Wisconsin Department of Transportation (excluding buildings).			
Bricklayer, Blocklayer or Stonemason	30.61	14.10	44.71
Future Increase(s): Add \$1.90 06/01/2009; Add \$1.95 05/31/2010			
Carpenter	27.51	13.48	40.99
Future Increase(s): Add \$2.25/hr on 6/1/2009; Add \$2.25/hr on 5/31/2010.			
Cement Finisher	28.07	13.28	41.35
Future Increase(s): Add \$1.60 on 6/1/09; Add \$1.55 on 6/1/10; Add \$1.00 6/1/11.			
Electrician	27.98	19.07	47.05
Fence Erector	17.35	2.32	19.67
Ironworker	30.30	15.77	46.07
Future Increase(s): Add \$2/hr on 6/1/2009; Add \$2/hr on 6/1/2010.			
Line Constructor (Electrical)	33.08	14.68	47.76
Painter	20.00	0.00	20.00
Pavement Marking Operator	23.40	6.15	29.55
Piledriver	28.01	13.48	41.49
Future Increase(s): Add \$2.25/hr on 6/1/2009; Add \$2.25/hr on 5/31/2010.			
Roofer or Waterproofer	27.85	7.51	35.36
Teledata Technician or Installer	20.69	10.23	30.92
Tuckpointer, Caulker or Cleaner	29.46	13.41	42.87
Underwater Diver (Except on Great Lakes)	33.50	11.84	45.34
Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	31.11	14.77	45.88
Premium Pay: NCCCO certification add \$1.73/hr.			
Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY	26.46	12.43	38.89
Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	23.16	11.48	34.64
Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	21.50	11.00	32.50
Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	18.19	10.04	28.23

TRUCK DRIVERS

Single Axle or Two Axle	35.51	0.00	35.51
Three or More Axle	22.35	7.16	29.51
Articulated, Euclid, Dumptor, Off Road Material Hauler	23.52	16.60	40.12
Future Increase(s): Add \$1.75/hr on 6/1/09; Add \$1.85/hr on 6/1/10; Add \$1.95/hr on 6/1/11; Add \$2/hr on 6/1/12; Add \$2/hr on 6/1/13.			
Premium Pay: Effective 6/1/09 for "Airport Pavement or State Highway Construction" project type only, add \$1.50/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).			
Pavement Marking Vehicle	20.06	11.55	31.61
Shadow or Pilot Vehicle	35.51	0.00	35.51
Truck Mechanic	19.00	11.14	30.14

Fringe Benefits Must Be Paid On All Hours Worked

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$
LABORERS			
General Laborer	24.15	11.75	35.90
Future Increase(s): Add \$1.55/hr on 6/1/2009; Add \$1.60/hr on 6/1/2010; Add \$1.60/hr on 6/1/2011; Add \$1.60/hr on 6/1/2012; Add \$1.70/hr on 6/1/2013; Add \$1.60/hr on 6/1/2014. Premium Pay: 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. Effective 6/1/09 for "Airport Pavement or State Highway Construction" project type only, 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).			
Asbestos Abatement Worker	22.06	12.40	34.46
Landscaper	24.15	11.75	35.90
Future Increase(s): Add \$1.55/hr on 6/1/09; Add \$1.60/hr on 6/1/10; Add \$1.60/hr on 6/1/11; Add \$1.60/hr on 6/1/12; Add \$1.70/hr on 6/1/13; Add \$1.60/hr on 6/1/14. Premium Pay: Effective 6/1/09 for "Airport Pavement or State Highway Construction" project type only, 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).			
Flagperson or Traffic Control Person	18.55	12.20	30.75
Fiber Optic Laborer (Outside, Other Than Concrete Encased)	16.58	12.00	28.58
Railroad Track Laborer	20.96	11.95	32.91
HEAVY EQUIPMENT OPERATORS			
Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 176 Feet or Over	30.97	16.60	47.57
Future Increase(s): Add \$1.75/hr on 6/1/09; Add \$1.85/hr on 6/1/10; Add \$1.95/hr on 6/1/11; Add \$2/hr on 6/1/12; Add \$2/hr on 6/1/13. Premium Pay: Effective 6/1/09 for "Airport Pavement or State Highway Construction" project type only, add \$1.50/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).			
Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 175 Feet or Under; Backhoe (Track Type) Having a Mfr.'s Rated Capacity of 130,000 Lbs. or Over; Caisson Rig; Pile Driver; Dredge (Not Performing Work on the Great Lakes)	30.47	16.60	47.07
Future Increase(s): Add \$1.75/hr on 6/1/09; Add \$1.85/hr on 6/1/10; Add \$1.95/hr on 6/1/11; Add \$2/hr on 6/1/12; Add \$2/hr on 6/1/13. Premium Pay: Effective 6/1/09 for "Airport Pavement or State Highway Construction" project type only, add \$1.50/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).			
Backhoe (Track Type) Having a Mfr.'s Rated Capacity of Under 130,000 Lbs.; Tractor or Truck Mounted Hydraulic Backhoe; Gradall (Cruz-Aire Type);	29.97	16.60	46.57

Fringe Benefits Must Be Paid On All Hours Worked

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$
Mechanic or Welder; Bulldozer or Endloader; Grader or Motor Patrol; Scraper (Self propelled or Tractor Drawn) 5 cu yards or more capacity; Concrete Pump, Grout Pump or Concrete Conveyor (Rotec or Bidwell Type); Concrete Breaker (Manual or Remote); Concrete Batch Plant; Power Subgrader; Concrete Spreader; Concrete Paver; Concrete Grinder or Planing Machine; Concrete Conveyor System; Concrete Slipform Placer Curb and Gutter Machine; Asphalt Plant; Asphalt Paver; Asphalt Screed; Asphalt Milling Machine; Roller (Over 5 Ton); Shouldering Machine; Boring Machine (Horizontal, Vertical or Directional); Air Track, Rotary or Percussion Drilling Machine; Straddle Carrier or Travel Lift; Trencher; Post Hole Digger or Driver; Tug or Launch (Not Performing Work on the Great Lakes) Future Increase(s): Add \$1.75/hr on 6/1/09; Add \$1.85/hr on 6/1/10; Add \$1.95/hr on 6/1/11; Add \$2/hr on 6/1/12; Add \$2/hr on 6/ 1/ 13. Premium Pay: Effective 6/1/09 for "Airport Pavement or State Highway Construction" project type only, add \$1.50/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).	29.71	16.60	46.31
Farm or Industrial Type Tractor; Greaser; Compactor (Self-Propelled); Concrete Saw (Vermeer Type); Concrete Bump Cutter or Grooving Machine; Tining or Curing Machine; Roller (5 Tons or Under); Broom or Sweeper; Environmental Burner Future Increase(s): Add \$1.75/hr on 6/1/09; Add \$1.85/hr on 6/1/10; Add \$1.95/hr on 6/1/11; Add \$2/hr on 6/1/12; Add \$2/hr on 6/ 1/ 13. Premium Pay: Effective 6/1/09 for "Airport Pavement or State Highway Construction" project type only, add \$1.50/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).	29.97	16.60	46.57
Oilier; Crusher, Screening or Wash Plant; Air Compressor; Generator; Pump (3 Inch or Over) or Well Points; Forklift; Skid Steer Loader (With or Without Attachments); Skid Rig; Stump Chipper; Mulcher; Vibratory Hammer or Extractor Future Increase(s): Add \$1.75/hr on 6/1/09; Add \$1.85/hr on 6/1/10; Add \$1.95/hr on 6/1/11; Add \$2/hr on 6/1/12; Add \$2/hr on 6/ 1/ 13. Premium Pay: Effective 6/1/09 for "Airport Pavement or State Highway Construction" project type only, add \$1.50/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).	26.46	12.69	39.15
Fiber Optic Cable Equipment			

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).

Bricklayer, Blocklayer or Stonemason Future Increase(s): Add \$1.90 06/01/2009; Add \$1.95 05/31/2010	29.24	13.80	43.04
Carpenter	29.02	13.58	42.60
Cement Finisher Future Increase(s): Add \$1.60 on 6/1/09; Add \$1.55 on 6/1/10; Add \$1.00 6/1/11.	28.07	13.28	41.35
Electrician Future Increase(s): Add \$1.70/hr on 6/1/2009; Add \$1.70/hr on 6/1/2010.	31.00	16.80	47.80
Fence Erector	17.35	2.32	19.67

Fringe Benefits Must Be Paid On All Hours Worked

TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
	\$	\$	\$
Ironworker	28.96	18.41	47.37
Line Constructor (Electrical)	33.08	14.68	47.76
Painter	20.00	0.00	20.00
Pavement Marking Operator	23.40	6.15	29.55
Piledriver	26.61	12.86	39.47
Roofer or Waterproofer	27.85	7.51	35.36
Teledata Technician or Installer	21.08	10.68	31.76
Future Increase(s): Add \$.90 on 6/1/09.			
Tuckpointer, Caulker or Cleaner	29.46	13.41	42.87
Underwater Diver (Except on Great Lakes)	33.50	11.84	45.34
Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	25.22	12.05	37.27
Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY	26.46	12.69	39.15
Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	23.16	11.48	34.64
Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	21.50	11.00	32.50
Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	18.19	10.04	28.23

TRUCK DRIVERS

Single Axle or Two Axle	27.00	0.00	27.00
Three or More Axle	17.50	12.94	30.44
Articulated, Euclid, Dumptor, Off Road Material Hauler	29.89	16.41	46.30
Future Increase(s): Add \$1.75/hr on 6/1/2009; Add \$1.80/hr on 6/1/2010.			
Pavement Marking Vehicle	20.06	11.55	31.61
Shadow or Pilot Vehicle	35.51	0.00	35.51
Truck Mechanic	19.00	11.14	30.14

LABORERS

General Laborer	21.69	12.17	33.86
Landscaper	17.25	2.76	20.01
Flagperson or Traffic Control Person	16.36	13.88	30.24
Fiber Optic Laborer (Outside, Other Than Concrete Encased)	16.58	12.00	28.58
Railroad Track Laborer	20.96	11.95	32.91

HEAVY EQUIPMENT OPERATORS
CONCRETE PAVEMENT OR BRIDGE WORK ONLY

Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 176 Feet or Over	29.97	15.95	45.92
Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 175 Feet or Under; Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of 130,000 Lbs. or Over; Caisson Rig; Pile Driver; Dredge (Not Performing Work on the Great Lakes)	30.47	16.60	47.07
Future Increase(s): Add \$1.75/hr on 6/1/09; Add \$1.85/hr on 6/1/10; Add \$1.95/hr on 6/1/11; Add \$2/hr on			

Fringe Benefits Must Be Paid On All Hours Worked

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$
6/1/12; Add \$2/hr on 6/ 1/ 13. Premium Pay: Effective 6/1/09 for "Airport Pavement or State Highway Construction" project type only, add \$1.50/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).			
Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of Under 130,000 Lbs.; Tractor or Truck Mounted Hydraulic Backhoe; Gradall (Cruz-Aire Type); Mechanic or Welder; Bulldozer or Endloader; Grader or Motor Patrol; Scraper (Self Propelled or Tractor Drawn) 5 cu yards or more capacity; Concrete Pump; Grout Pump or Concrete Conveyor (Rotec or Bidwell Type); Concrete Breaker (Manual or Remote); Concrete Batch Plant; Power Subgrader; Concrete Spreader; Concrete Paver; Concrete Grinder or Planing Machine; Concrete Conveyor System; Concrete Slipform Placer; Curb and Gutter Machine; Air Track, Rotary or Percussion Drilling Machine; Straddle Carrier or Travel Lift; Trencher; Post Hole Digger or Driver; Tug or Launch (Not Performing Work on the Great Lakes) Future Increase(s): Add \$1.75/hr on 6/1/09; Add \$1.85/hr on 6/1/10; Add \$1.95/hr on 6/1/11; Add \$2/hr on 6/1/12; Add \$2/hr on 6/ 1/ 13. Premium Pay: Effective 6/1/09 for "Airport Pavement or State Highway Construction" project type only, add \$1.50/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).	29.97	16.60	46.57
Farm or Industrial Type Tractor; Greaser; Compactor (Self-Propelled); Concrete Saw (Vermeer Type); Concrete Bump Cutter or Grooving Machine; Tining or Curing Machine; Environmental Burner Future Increase(s): Add \$1.75/hr on 6/1/09; Add \$1.85/hr on 6/1/10; Add \$1.95/hr on 6/1/11; Add \$2/hr on 6/1/12; Add \$2/hr on 6/ 1/ 13. Premium Pay: Effective 6/1/09 for "Airport Pavement or State Highway Construction" project type only, add \$1.50/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).	29.97	16.60	46.57
Oilier; Crusher, Screening or Wash Plant; Air Compressor; Generator; Pump (3 Inch or Over) or Well Points; Forklift; Skid Steer Loader (With or Without Attachments); Skid Rig; Stump Chipper; Mulcher; Vibratory Hammer or Extractor	28.42	15.98	44.40
Fiber Optic Cable Equipment	26.46	12.69	39.15

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

Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 176 Feet or Over	29.97	15.95	45.92
Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 175 Feet or Under; Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of 130,000 Lbs. or Over; Caisson Rig; Pile Driver; Dredge (Not Performing Work on the Great Lakes)	29.47	15.95	45.42
Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of Under 130,000 Lbs.; Tractor or Truck Mounted Hydraulic Backhoe; Gradall (Cruz-Aire Type); Mechanic or Welder; Bulldozer or Endloader; Grader or Motor Patrol;	29.89	16.41	46.30

Fringe Benefits Must Be Paid On All Hours Worked

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$
Scraper (Self propelled or Tractor Drawn) 5 cu yards or more capacity; Concrete Breaker (Manual or Remote); Power Subgrader; Concrete Grinder or Planing Machine; Concrete Slipform Placer; Curb and Gutter Machine; Asphalt Plant; Asphalt Paver; Asphalt Screed; Asphalt Milling Machine; Roller (Over 5 Ton); Shouldering Machine; Trencher; Post Hole Digger or Driver Future Increase(s): Add \$1.75/hr on 6/1/2009; Add \$1.80/hr on 6/1/2010.			
Farm or Industrial Type Tractor; Greaser; Compactor (Self-Propelled); Roller (5 Ton or Under); Broom or Sweeper; Environmental Burner Future Increase(s): Add \$1.75/hr on 6/1/09; Add \$1.85/hr on 6/1/10; Add \$1.95/hr on 6/1/11; Add \$2/hr on 6/1/12; Add \$2/hr on 6/ 1/ 13.	29.42	18.25	45.67
Oilier; Crusher, Screening or Wash Plant; Air Compressor; Generator; Pump (3 Inch or Over) or Well Points; Forklift; Skid Steer Loader (With or Without Attachments); Skid Rig; Stump Chipper; Mulcher; Vibratory Hammer or Extractor	28.42	16.04	44.46
Fiber Optic Cable Equipment	26.46	12.69	39.15

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.

Acoustic Ceiling Tile Installer	26.11	6.01	32.12
Boilermaker	19.00	4.52	23.52
Bricklayer, Blocklayer or Stonemason Future Increase(s): Add \$1.90 06/01/2009; Add \$1.95 05/31/2010	30.61	14.10	44.71
Cabinet Installer	22.00	3.63	25.63
Carpenter	26.11	5.95	32.06
Carpet Layer or Soft Floor Coverer	22.00	1.40	23.40
Cement Finisher	27.00	1.57	28.57
Drywall Taper or Finisher Future Increase(s): Add \$1.60/hr on 6/1/09	25.30	12.15	37.45
Electrician	27.00	8.06	35.06
Elevator Constructor	42.73	16.47	59.20
Fence Erector	16.50	7.87	24.37
Fire Sprinkler Fitter	34.44	14.00	48.44
Glazier	35.45	6.05	41.50
Heat or Frost Insulator	30.63	16.66	47.29
Insulator (Batt or Blown)	19.00	7.42	26.42
Ironworker Future Increase(s): Add \$2/hr on 6/1/2009; Add \$2/hr on 6/1/2010.	30.30	15.77	46.07
Lather	29.02	13.58	42.60
Marble Finisher	14.95	0.27	15.22
Marble Mason	19.58	0.00	19.58

Fringe Benefits Must Be Paid On All Hours Worked

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$
Metal Building Erector	26.11	5.95	32.06
Overhead Door Installer	16.15	0.95	17.10
Painter	24.00	5.11	29.11
Pavement Marking Operator	24.45	12.35	36.80
Plasterer	17.00	4.75	21.75
Plumber	33.50	11.24	44.74
Refrigeration Mechanic	24.50	7.13	31.63
Roofer or Waterproofer	18.00	6.38	24.38
Sheet Metal Worker	21.03	3.35	24.38
Steamfitter	20.94	13.93	34.87
Teledata Technician or Installer	18.41	0.00	18.41
Temperature Control Installer	15.00	0.00	15.00
Terrazzo Finisher	45.00	0.00	45.00
Terrazzo Mechanic	29.46	13.41	42.87
Tile Finisher	14.95	0.27	15.22
Tile Setter	26.27	5.86	32.13
Tuckpointer, Caulker or Cleaner	30.37	13.55	43.92
Well Driller or Pump Installer	15.10	11.08	26.18
Siding Installer	18.50	2.10	20.60
TRUCK DRIVERS			
Single Axle or Two Axle	26.50	4.38	30.88
Three or More Axle	19.50	4.00	23.50
Pavement Marking Vehicle	20.06	11.55	31.61
Truck Mechanic	14.75	2.92	17.67
LABORERS			
General Laborer	21.69	5.72	27.41
Asbestos Abatement Worker	22.00	4.90	26.90
Landscaper	17.25	3.28	20.53
Fiber Optic Laborer (Outside, Other Than Concrete Encased)	16.58	12.00	28.58
HEAVY EQUIPMENT OPERATORS			
Crane; Backhoe (Track Type); Tractor or Truck Mounted Hydraulic Backhoe; Bulldozer or Endloader; Grader or Motor Patrol; Scraper (Self Propelled or Tractor Drawn) 5 cu yards or more capacity; Concrete Pump, Grout Pump or Concrete Conveyor (Rotec or Bidwell Type); Concrete Breaker (Manual or Remote); Concrete Slipform Placer; Curb and Gutter Machine; Asphalt Paver; Roller (Over 5 Ton); Manhoist or Elevator; Material or Stack Hoist	24.75	5.34	30.09
Farm or Industrial Type Tractor; Compactor (Self-Propelled); Asphalt Screed; Roller (5 Tons or Under); Broom or Sweeper; Forklift; Skid Steer Loader (With or Without Attachments); Skid Rig; Stump Chipper; Mulcher	24.45	12.35	36.80

Fringe Benefits Must Be Paid On All Hours Worked

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$

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 most 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) 266-3148.

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

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

Any contractor, subcontractor or agent thereof, 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 determined under sub.(3), shall be liable to any affected employe in the amount of his or her unpaid wages or his or her unpaid overtime compensation and in an additional equal amount as liquidated damages. An action to recover the liability may be maintained in any court of competent jurisdiction by any employe for and in behalf of that employe and other employes similarly situated. No employe may be a party plaintiff to any such action unless the employe consents in writing to become such 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.