RFB NO. 322004

CONSTRUCTION DOCUMENTS
PROJECT MANUAL

DANE COUNTY DEPARTMENT OF ADMINISTRATION.
PUBLIC WORKS DIVISION

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

REQUEST FOR BIDS NO. 322004
MCCARTHY PARK IMPROVEMENTS
MCCARTHY YOUTH & CONSERVATION COUNTY PARK
4841 CO HWY TT
COTTAGE GROVE, WISCONSIN

ISSUED FOR BIDS: FEBRUARY 1, 2022

Due Date / Time: **TUESDAY, MARCH 22, 2021 / 2:00 P.M.**

Location: **PUBLIC WORKS OFFICE**

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

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

FOR INFORMATION ON THIS REQUEST FOR BIDS, PLEASE CONTACT:

ERIC URTES, AIA, PROJECT MANAGER
TELEPHONE NO.: 608/266-4798
FAX NO.: 608/267-1533
E-MAIL: URTES.ERIC@COUNTYOFDANE.COM

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E2.0 – Partial Site Plan
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E4.0 – Symbols, Schedules, Details
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END OF SECTION

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INVITATION TO BID

LEGAL NOTICE

Dane County Dept. of Administration Public Works Division, 1919 Alliant Energy Center Way, Madison, WI 53713, will receive sealed Bids until:

2:00 P.M., TUESDAY, MARCH 22, 2022

RFB NO. 322004

MCCARTHY PARK IMPROVEMENTS

MCCARTHY YOUTH & CONSESERVATION COUNTY PARK

4841 CO HWY TT, COTTAGE GROVE, WI

Dane County is inviting Bids for construction services to provide facility improvements at McCarthy County Park. Only firms with capabilities, experience & expertise with similar projects should obtain this Request for Bids (RFB) document & submit Bids.

RFB document may be obtained after **2:00 p.m., February 1, 2022** from bids-pwht.countyofdane.com. Call Eric Urtes, AIA, Project Mgr., 608/266-4798, or email urtes.eric@countyofdane.com, with any questions.

Bidders must be qualified as Best Value Contractor before Bid Due Date / Time. Complete Application at publicworks.countyofdane.com/bvc or call 608/267-0119.

Pre-bid site tour will be March 2, 2022 at 10:00 a.m. at McCarthy Youth & Conservation County Park, 4841 County Highway TT, Cottage Grove, WI. Bidders strongly encouraged to attend. See RFB for mandatory disease transmission prevention practices.

PUBLISH: FEBRUARY 1 & FEBRUARY 8, 2022 - WISCONSIN STATE JOURNAL

JANUARY 31 & FEBRUARY 7, 2022 - THE DAILY REPORTER

END OF SECTION

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INSTRUCTIONS TO BIDDERS

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1. GENERAL

A. Before submitting Bid, bidder shall thoroughly examine all Construction Documents. Successful Bidder shall be required to provide all the Work that is shown on Drawings, set forth in Specifications, or reasonably implied as necessary to complete Contract for this project.

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

C. Pre-bid meeting is scheduled on March 2, 2022 at 10 a.m. at McCarthy Youth & Conservation County Park, 4841 County Highway TT, Cottage Grove. Attendance by all bidders is optional, however bidders and subcontractors are strongly encouraged to attend.

D. Safe distancing & face masks are required for all tour attendees. Do not visit the site if you are or have recently been ill.

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

2. DRAWINGS AND SPECIFICATIONS

A. Drawings and Specifications that form part of this Contract, as stated in Article 1 of General Conditions of Contact, are enumerated in Document Index of these Construction Documents.

B. Complete sets of Drawings and Specifications for all trades will be available to all Bidders, irrespective of category of work to be bid on, in order that all Bidders may be familiar with work of other trades as they affect their bid.

3. INTERPRETATION

A. No verbal explanation or instructions will be given in regard to meaning of Drawings or Specifications before Bid Due Date. Bidders shall bring inadequacies, omissions or conflicts to Owner or Architect / Engineer's attention at least ten (10) calendar days before Bid Due Date. Prompt clarification will be available to all bidders by Addendum.

B. Failure to so request clarification or interpretation of Drawings and Specifications will not relieve successful Bidder of responsibility. Signing of Contract will be considered as implicitly denoting that Contractor has thorough understanding of scope of the Work and comprehension of Construction Documents.

C. Owner will not be responsible for verbal instructions.

4. QUALIFICATIONS OF BIDDER (CONTRACTOR AND SUBCONTRACTOR)

A. Before award of Contract can be approved, Owner shall be satisfied that Bidder involved meets following requirements:

1. Has completed at least one (1) project of at least fifty percent (50%) of size or value of Division of work being bid and type of work completed is similar to that being bid. If greater magnitude of experience is deemed necessary, other than size or value of work, such requirements will be described in appropriate section of Specifications.

2. Maintains permanent place of business.

3. Can be bonded for terms of proposed Contract.

4. Contractor and subcontractors shall meet all applicable Best Value Contractor requirements.

5. Has record of satisfactorily completing past projects and supplies list of no more than three (3) most recent, similar projects, with architect or engineer's and owner's names, addresses and telephone numbers for each project. Submit to Public Works Project Manager with Bid, within three (3) business days after Bid Due Date. Criteria which will be considered in determining satisfactory completion of projects by bidder will include:

    a. Completed contracts in accordance with drawings and specifications.
    b. Diligently pursued execution of work and completed contracts according to established time schedule unless Owner grants extensions.
    c. Fulfilled guarantee requirements of construction documents.
    d. Is not presently on ineligible list maintained by County's Department of Administration for noncompliance with equal employment opportunities and affirmative action requirements.
    e. Authorized to conduct business in Wisconsin. By submitting Bid, bidder warrants that it has: complied with all necessary requirements to do business in State of

Wisconsin; that persons executing contract on its behalf are authorized to do so; and, if corporation, that name and address of bidder's registered agent are as set forth in Contract. Bidder shall notify Owner immediately, in writing, of any change in its registered agent, their address, and bidder's legal status. For partnership, term "registered agent" shall mean general partner.

B. County's Public Works Project Manager will make such investigations as are deemed necessary to determine ability of bidder to perform the Work, and bidder shall furnish to County's Public Works Project Manager or designee all such information and data for this purpose as County's Public Works Project Manager may request. Owner reserves right to reject Bid if evidence submitted by, or investigation of, bidder fails to satisfy Owner that bidder is responsible and qualified to carry out obligations of Contract and to complete the Work contemplated therein.

5. BID GUARANTEE

A. Bank certified check, cashier's check or Bid Bond, payable to County in amount not less than five percent (5%) of maximum bid, shall accompany each Bid as guarantee that if Bid is accepted, Bidder will execute and return proposed Contract and Performance and Payment Bonds within ten (10) business days after being notified of acceptance of Bid. Company issuing bonds must be licensed to do business in Wisconsin.

B. Any bid, which is not accompanied by bid guarantee, will be considered "No Bid" and will not be read at Bid Due Date.

C. If successful Bidder so delivers Contract, Certificate of Insurance, and Performance and Payment Bonds, check will be returned to Bidder. In case Bidder fails to deliver such Contract, insurance, and bond, amount of bid guarantee will be forfeited to County as liquidated damages.

D. All checks tendered as bid guarantee, except those of three (3) lowest qualified, responsible bidders, will be returned to their makers within three (3) business days after Bid Due Date. All such retained checks will be returned immediately upon signing of Contract and Performance and Payment Bonds by successful Bidder.

6. WITHDRAWAL OF BIDS

A. Bids may be withdrawn by written request received from bidder or authorized representative thereof prior to time fixed for Bid Due Date, without prejudice to right of bidder to file new Bid. Withdrawn Bids will be returned unopened. Negligence on part of bidder in preparing their Bid confers no right for withdrawal of Bid after it has been opened.

B. No Bid may be withdrawn for period of sixty (60) calendar days after Bid Due Date.

C. If Bid contains error, omission or mistake, bidder may limit liability to amount of bidder's guarantee by giving written Notice of Intent not to execute Contract to Owner within seventy-two (72) hours of Bid Due Date.

7. CONTRACT FORM

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

8. CONTRACT INTERESTS BY COUNTY PUBLIC OFFICIALS

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

9. EMERGING SMALL BUSINESS PROVISIONS

A. **Emerging Small Business Definition.** For purposes of this section, ESB is defined as:

1. Independent business concern that has been in business minimum of one year;

2. Business located in State of Wisconsin;

3. Business comprised of less than twenty-five (25) employees;

4. Business must not have gross sales in excess of three million dollars ($3,000,000.00) over past three years; and

5. Business does not have history of failing to complete projects.

B. **Emerging Small Business (ESB) Involvement.** Bidder shall make good faith effort to award minimum of ten percent (10%) of the Work to ESBs. Bidder shall submit report to Dane County Contract Compliance Specialist within ten (10) business days of Bid Due Date demonstrating such efforts. Good faith efforts means significant contact with ESBs for purposes of soliciting bids from them. Failure to make or demonstrate good faith efforts will be grounds for disqualification.

C. **Emerging Small Business Report.** Emerging Small Business Enterprise Report is to be submitted by Bidder in separate envelope marked “Emerging Small Business Report”. This report is due by 2:00 p.m. following specified ten (10) business days after Bid Due Date. Bidder who fails to submit Emerging Small Business Report shall be deemed not responsive.

D. **ESB Goal.** Goal of this project is ten percent (10%) ESB participation. ESB utilizations are shown as percentage of total Bid. If Bidder meets or exceeds specified goal, Bidder is only required to submit Form A - Certification, and Form B - Involvement. Goal shall be met if Bidder qualifies as ESB.

E. **Report Contents.** Following award of Contract, Bidder shall submit copies of executed contracts for all Emerging Small Businesses. Emerging Small Business Report shall consist of these:

1. Form A - Certification;

2. Form B - Involvement;

3. Form C - Contacts;

4. Form D - Certification Statement (if appropriate); and

5. Supportive documentation (i.e., copies of correspondence, telephone logs, copies of advertisements).

F. **ESB Listing.** Bidders may solicit bids from *Dane County Targeted Business Directory* by going to this website. Do not click as a link; copy & paste address into a web browser.
https://equity.countyofdane.com/documents/PDFs/Targeted-Business-Directory.xlsx

G. **DBE Listing.** Bidders may also solicit bids from *State of Wisconsin DOT Disadvantaged Business Enterprise Unified Certification Program (DBE / UCP) Directory* by going to this website. These are not only transportation-related designers & contractors. Do not click as a link; copy & paste address into a web browser.
https://wisconsindot.gov/Documents/doing-bus/civil-rights/dbe/dbe-ucp-directory.xlsx

H. **ESB Certification.** All contractors, subcontractors and suppliers seeking ESB certification must complete and submit Emerging Small Business Report to Dane County Contract Compliance Program.

I. **Certification Statement.** If ESB firm has not been certified by County as ESB prior to submittal of this Bid, ESB Report cannot be used to fulfill ESB goal for this project unless firm provides "Form D - Certification Statement". Certification statement must be completed and signed by ESB firm.

J. **Questions.** Questions concerning Emerging Small Business provisions shall be directed to:

OEI@countyofdane.com
or
Dane County Contract Compliance Specialist
City-County Building, Room 356
210 Martin Luther King, Jr. Blvd.
Madison, WI 53703
608/266-4192

K. **Substituting ESBs.** In event of any significant changes in subcontract arrangements or if need arises to substitute ESBs, Bidder shall report such proposed changes to Contract Compliance Specialist to making any official changes and request authorization to substitute ESB firm. Bidder further agrees to make every possible effort to replace ESB firm with another qualified ESB firm.

L. **Good Faith Efforts.** Good faith efforts can be demonstrated by meeting all of these obligations:

1. Selecting portions of the Work to be performed by ESBs in order to increase likelihood of meeting ESB goal including, where appropriate, breaking down Contract into smaller units to facilitate ESB participation.

2. Advertising in general circulation, trade associations and women / minority focus media concerning subcontracting opportunities.

3. Providing written notices to reasonable number of specific ESBs that their interest in Contract was being solicited in sufficient time to allow ESBs to participate effectively.

4. Following up on initial solicitations of interest by contacting ESBs within five (5) business days prior to Bid Due Date to determine with certainty whether ESB were interested, to allow ESBs to prepare bids.

5. Providing interested ESB with adequate information about Drawings, Specifications and requirements of Contract.

6. Using services of available minority, women and small business organizations and other organizations that provide assistance in recruitment of MBEs / WBEs / ESBs.

7. Negotiating in good faith with interested ESBs, not rejecting ESBs as unqualified without sound reason based on thorough investigation of their capabilities.

8. Submitting required project reports and accompanying documents to County's Contract Compliance Specialist within twenty-four (24) hours after Bid Due Date.

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

10. METHOD OF AWARD - RESERVATIONS

A. Following will be basis of award of Contract, providing cost does not exceed amount of funds then estimated by County as available to finance Contract(s):

1. Lowest dollar amount submitted by qualified responsible bidder on Base Bid for all work comprising project, combined with such additive Owner accepted alternates.

2. Owner reserves right to reject all bids or any bid, to waive any informality in any bid, and to accept any bid that will best serve interests of County.

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

11. SECURITY FOR PERFORMANCE AND PAYMENTS

A. Simultaneous with delivery of signed Contract, Bidder shall be required to furnish Performance and Payment Bonds as specified in Article 29 of General Conditions of Contract, "Contract Security." Surety Company shall be licensed to do business in Wisconsin. Performance and Payment Bonds must be dated same date or subsequent to date of Contract. Performance and Payment Bonds must emulate information in Sample Performance and Payment Bonds in Construction Documents.

B. Provide certified copy of power of attorney from Surety Company showing that agent who signs Bond has power of attorney to sign for Surety Company. Secretary or Assistant Secretary of company must sign this certification, not attorney-in-fact. Certification must bear same or later date as Bond. Power of Attorney must emulate model power of attorney information detailed in Sample Performance and Payment Bonds.

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

D. If Bidder is corporation, it is necessary that current certified copy of resolution or other official act of directors of corporation be submitted showing that person who signs Contract is authorized to sign contracts for corporation. It is also necessary that corporate seal be affixed to resolution, contract, and performance and payment bonds. If your corporation has no seal, it is required that above documents include statement or notation to effect that corporation has no seal.

12. TAXES

A. Wisconsin Statute 77.54 (9m) allows building materials that become part of local unit government facilities to be exempt from sales & use tax. Vendors & materials suppliers may not charge Bidders sales & use tax on these purchases. This does not include highways, streets or roads. Any other Sales, Consumer, Use & other similar taxes or fees required by law shall be included in Bid.

B. In accordance with Wisconsin Statute 71.80(16)(a),successful nonresident bidder, whether incorporated or not, and not otherwise regularly engaged in business in this state, shall file surety bond with State of Wisconsin Department of Revenue payable to Department of Revenue, to guarantee payment of income taxes, required unemployment compensation contributions, sales and use taxes and income taxes withheld from wages of employees, together with any penalties and interest thereon. Amount of bond shall be three percent (3%) of Contract or subcontract price on all contracts of $50,000 or more.

13. SUBMISSION OF BIDS

A. All Bids shall be submitted on standard Bid Form bound herein and only Bids that are made on this Bid Form will be considered. Entire Bid Form and other supporting documents, if any, shall be removed or copied from Construction Documents, filled out, and submitted in manner specified hereinafter. Submit completed Bid Bond with Bid as well.

B. No bids for any subdivision or any sub-classification of the Work, except as indicated, will be accepted. Any conditional Bid, amendment to Bid Form or appended item thereto, or inclusion of any correspondence, written or printed matter, or details of any nature other than that specifically called for, which would alter any essential provision of Construction Documents, or require consideration of unsolicited material or data in determining award of Contract, will disqualify Bid. Telecommunication alterations to Bid will not be accepted.

C. Bidders must submit single Bid for all the Work.

D. Bid amounts shall be inserted in words and in figures in spaces provided on Bid Form; in case of conflict, written word amounts will govern.

E. Addenda issued after Bid Letting shall become part of Construction Documents. Bidders shall acknowledge receipt of such addenda in appropriate space provided on Bid Form. Bid may be rejected if receipt of any particular addendum applicable to award of Contract has not been acknowledged on Bid Form.

F. Bids shall be signed, placed in envelope, sealed and delivered before due time to place designated in Invitation to Bid, and identified with project name, bid number, location, category of work being bid upon, Bid Due Date, name and address of bidder.

G. Bidder shall be responsible for sealed Bid being delivered to place designated for Bid Due Date on or before date and time specified. Bids received after time of closing will be rejected and returned to bidder unopened.

H. Current conditions prevent public bid openings.

I. Bids hand delivered & dropped off at Public Works' physical address should be placed in the "Public Works Bids & Proposals" drop box placed outside or just inside the building's front vestibule.

J. Bid will be opened on listed due date & time & results should be available within 24 hours at bids-pwht.countyofdane.com.

K. Bid will be considered invalid and will be rejected if bidder has not signed it.

L. Faxed or emailed Bids will not be accepted.

M. Bidder's organization shall submit completed with Bid, Fair Labor Practices Certification form, included in these Construction Documents.

14. SUBCONTRACTOR LISTING

A. Bidders are required to submit Section 00 43 36, Proposed Subcontractors Form listing all subcontractors for this project including committed prices for each subcontractor. Project Manager must receive Form no later than when successful Bidder submits their signed Contract. Failure to submit may delay progress payments.

15. ALTERNATE BIDS

A. Not Applicable.

16. INFORMATIONAL BIDS

A. Not Applicable.

17. UNIT PRICES

A. Not Applicable.

18. COMMENCEMENT AND COMPLETION

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

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

19. WORK BY OWNER

A. Not Applicable.

20. SPECIAL HAZARDS COVERAGE

A. Not Applicable.

FORM A

DANE COUNTY
EMERGING SMALL BUSINESS REPORT - CERTIFICATION

In accordance with General Conditions of Contract, submit this Emerging Small Business Report within ten (10) days after Bid Due Date.

PROJECT NAME: _____

_____

BID NO.: _____ BID DUE DATE: _____

BIDDER INFORMATION

COMPANY NAME: _____

ADDRESS: _____

_____

TELEPHONE NO.: _____

CONTACT PERSON: _____

EMAIL ADDRESS: _____

FORM B

DANE COUNTY
(Copy this Form as necessary to provide complete information)
EMERGING SMALL BUSINESS REPORT - INVOLVEMENT

COMPANY NAME: _____

PROJECT NAME: _____

BID NO.: _____ BID DUE DATE: _____

ESB NAME: _____

CONTACT PERSON: _____

ADDRESS: _____

_____

PHONE NO & EMAIL.: _____

_____

Indicate percentage of financial commitment to this ESB: _____% Amount: $_____

ESB NAME: _____

CONTACT PERSON: _____

ADDRESS: _____

_____

PHONE NO & EMAIL.: _____

_____

Indicate percentage of financial commitment to this ESB: _____% Amount: $_____

FORM C

DANE COUNTY
(Copy this Form as necessary to provide complete information)
EMERGING SMALL BUSINESS REPORT - CONTACTS

COMPANY NAME: _____

PROJECT NAME: _____

BID NO.: _____ BID DUE DATE: _____

	ESB FIRM NAME CONTACTED	DATE	PERSON CONTACTED	DID ESB BID?	ACC-EPT BID?	REASON FOR REJECTION
1)						
2)						
3)						
4)						
5)						
6)						
7)						
8)						

FORM D

DANE COUNTY
EMERGING SMALL BUSINESS REPORT - CERTIFICATION STATEMENT

I, _____ , _____ of
Name Title

_____ certify to best of my knowledge and
Company

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

_____ _____
Bidder's Signature Date

Name of Bidding Firm: _____

SECTION 00 41 13

BID FORM

BID NO. 322004
PROJECT: MCCARTHY PARK IMPROVEMENTS
MCCARTHY YOUTH & CONSERVATION COUNTY PARK

TO: DANE COUNTY PUBLIC WORKS, ENGINEERING DIVISION
PROJECT MANAGER
1919 ALLIANT ENERGY CENTER WAY
MADISON, WISCONSIN 53713

NOTE: WISCONSIN STATUTE 77.54 (9M) ALLOWS FOR NO SALES & USE TAX ON THE PURCHASE OF MATERIALS FOR COUNTY PUBLIC WORKS PROJECTS.

BASE BID - LUMP SUM:
Construction services to provide facility improvements to McCarthy Park including a new shelter and paved lot. The undersigned, having examined the site where the Work is to be executed and having become familiar with local conditions affecting the cost of the Work and having carefully examined the Drawings and Specifications, all other Construction Documents and Addenda thereto prepared by Dane County Public Works Engineering Division hereby agrees to provide all labor, materials, equipment and services necessary for the complete and satisfactory execution of the entire Work, as specified in the Construction Documents, for the Base Bid stipulated sum of:

_____ and __ /100 Dollars
Written Price

$ _____
Numeric Price

UNIT PRICING:
Provide prices for following items to be included in base bid. Refer to section 012200, Measurements and Payment, for bid item details.

- 250 lin. Ft. – Retaining Wall: @ $ _____/lin. ft = _____
- 235 lin. Ft. – Pavement Saw Cut: @ $ _____/lin. ft = _____
- 880 ton – ¾" Crushed Aggregate Base: @ $ _____/ton = _____
- 620 ton – 3' HMA Paving: @ $ _____/ton = _____
- 375 cu. yd. – Excavation: @ $ _____/cu. yd. = _____
- 2,800 sq. ft. – Concrete Sidewalk: @ $ _____/sq. ft. = _____
- 160 lin. Ft. – Water Line: @ $ _____/lin. ft = _____
- 50 lin. ft. – 4" HDPE Storm Sewer: @ $ _____/lin. ft.. = _____

- 55 lin ft. – 8" HDPE Storm Sewer: @ $_____/lin. ft. = _____
- 115 lin ft. – 12" HDPE Storm Sewer: @ $_____/lin. ft. = _____
- 2 units – 24" ADS Manhole: @ $_____/unit. = _____
- 2 units – 36" ADS Manhole (Biofilter): @ $_____/unit. = _____
- 15,000 sq. ft. – Restoration: @ $_____/sq. ft. = _____

LUMP SUM ALLOWANCE

Provide a lump sum allowance to be included in the Base Bid of Fifteen Thousand dollars ($15,000.00). This allowance will be used for electrical services in coordination with the County & the Architect / Engineer. Section 01220, Measurement and Payment, has the project requirements.

Fifteen Thousand - and 00 /100 Dollars

Written Price

$15,000.00

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

Addendum No(s). _____ through _____

Dated _____

Dane County Department of Land and Water Resources, Parks Division must have this project completed by June 30, 2023. Assuming this Work can be started by May 9, 2022, what dates can you commence and complete this job?

Commencement Date: _____ Completion Date: _____
(final, not substantial)

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

_____
(Name of Corporation, Partnership or Person submitting Bid)

Select one of the following:

1. A corporation organized and existing under the laws of the State of _____, or

2. A partnership consisting of _____, or

3. A person conducting business as _____;

Of the City, Village, or Town of _____ of the State of _____.

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

The undersigned is qualified as a Best Value Contractor or has proven their exemption. Qualification or exemption shall be complete before Bid Due Date / Time.

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

SIGNATURE: _____
(Bid is invalid without signature)

Print Name: _____ Date: _____

Title: _____

Address: _____

Telephone No.: _____ Fax No.: _____

Email Address: _____

Contact Person: _____

END OF SECTION

THIS PAGE IS FOR BIDDERS' REFERENCE

DO NOT SUBMIT WITH BID FORM.

BID CHECK LIST:
These items **must** be included with Bid:
☐ Bid Form ☐ Bid Bond
☐ Fair Labor Practices Certification

DANE COUNTY BEST VALUE CONTRACTING QUALIFICATION

General Contractors & all Subcontractors must be qualified as a Best Value Contractor with the Dane County Public Works Engineering Division. Qualification & listing is not permanent & must be renewed every 36 months. Complete a *Best Value Contracting Application* online at:
publicworks.countyofdane.com/bvc

DANE COUNTY VENDOR REGISTRATION PROGRAM

All bidders are strongly encouraged to be a registered vendor with Dane County. Registering allows vendors an opportunity to receive notifications for RFBs & RFPs issued by the County and provides the County with up-to-date company contact information. Complete a new form or renewal online at:
danepurchasing.com/Account/Login?

SECTION 00 43 36

PROPOSED SUBCONTRACTORS FORM

General Contractor Name: _____ Bid No: _____

Instructions:
1. Complete all information in table below.
2. Include this Form with signed Construction Contract (Section 00 52 96).
3. General contractors & subcontractors must be qualified & registered as Best Value Contractor (Dane County Ordinances, Chapter 40.07). General contractors must be qualified & registered before bids are due. Subcontractors must be qualified & registered 10 working days before performing any work related to Construction Contract. No contractor can perform work without being qualified & registered.
4. Sample Best Value Contracting Application is included in this RFB package for informational purposes; fill out form online (publicworks.countyofdane.com/bvc).

SUBCONTRACTOR NAME	ADDRESS & PHONE NO.	DIVISION OF WORK	$$ AMOUNT OF CONTRACT

Check box if there is another form page attached to include additional subcontractors. ☐

The undersigned, for and on behalf of the General Contractor named herein, certifies the information on this Form is accurate.

_____ _____
Officer or Authorized Agent Signature Date

_____
Printed or Typed Name and Title

SUBCONTRACTOR NAME	ADDRESS & PHONE NO.	DIVISION OF WORK	$$ AMOUNT OF CONTRACT

END OF SECTION

COUNTY OF DANE

PUBLIC WORKS CONSTRUCTION CONTRACT

Contract No. _____ Bid No. 322004

Authority: 2021 RES -_____

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

W I T N E S S E T H :

WHEREAS, COUNTY, whose address is c/o Public Works Director, 1919 Alliant Energy Center Way, Madison, WI 53713, desires to have CONTRACTOR provide McCarthy Park Facility Improvements ("the Project"); and

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

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

1. CONTRACTOR agrees to construct, for the price of $_____ the Project and at the CONTRACTOR'S own proper cost and expense to furnish all materials, supplies, machinery, equipment, tools, superintendence labor, insurance, and other accessories and services necessary to complete the Project in accordance with the conditions and prices stated in the Bid Form, General Conditions of Contract, the drawings which include all maps, plats, plans, and other drawings and printed or written explanatory matter thereof, and the specifications therefore as prepared by _____ (hereinafter referred to as "the Architect / Engineer"), and as enumerated in the Project Manual Table of Contents, all of which are made a part hereof and collectively evidence and constitute the Contract.

2. The term of this Contract shall commence when fully executed by the parties. The CONTRACTOR shall commence the Work by _____. The Work's substantial completion date shall be _____. Failure to meet commence work or substantial completion dates on the Work as set forth herein is grounds for termination of the Contract and other remedies as set forth in the General Conditions of Contract incorporated herein.

3. COUNTY agrees to pay the CONTRACTOR in current funds for the performance of the Contract subject to additions and deductions, as provided in the General Conditions of Contract, and to make payments on account thereof as provided in Article entitled, "Payments to Contractor" of the General Conditions of Contract.

4. During the term of this Contract, CONTRACTOR agrees to take affirmative action to ensure equal employment opportunities. The CONTRACTOR agrees in accordance with Wisconsin Statute 111.321 and Chapter 19 of the Dane County Code of Ordinances not to discriminate on the basis of age, race, ethnicity, religion, color, gender, disability, marital status, sexual orientation, national origin, cultural differences, ancestry, physical appearance, arrest record or conviction record, military participation or membership in the national guard, state defense force or any other reserve component of the military forces of the United States, or political beliefs. Such equal opportunity shall include, but not be limited to, the following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, rates of pay, and any other form of compensation. CONTRACTOR agrees to post in conspicuous places, available to all employees and applicants for employment, notices setting forth the provisions of this paragraph.

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

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

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

8. The intent of this Contract is to be a Contract solely between the parties hereto and for their benefit only. Do not construe any part of this Contract to add to, supplement, amend, abridge or repeal existing rights, benefits or privileges of any third party or parties including, but not limited to, employees of the parties.

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

10. CONTRACTOR must be qualified as a Best Value Contractor or have proven their exemption with Dane County Public Works Engineering Division before Bid Due Date / Time. All contractors and subcontractors must be qualified as a Best Value Contractor or have proven their exemption to perform any work under this Contract.

11. This Contract, and any amendment or addendum relating to it, may be executed and transmitted to any other party by legible facsimile reproduction or by scanned legible electronic PDF copy, and utilized in all respects as, an original, wet-inked manually executed document. Further, this Contract and any amendment or addendum thereto, may be stored and reproduced by each party electronically, photographically, by photocopy or other similar process, and each party may at its option destroy any original document so reproduced. All parties hereto stipulate that any such legible reproduction shall be admissible in evidence as the original itself in any judicial, arbitration or administrative proceeding whether or not the original is in existence and whether or

not each party made such reproduction in the regular course of business. This term does not apply to the service of notices under this Contract.

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

* * * * * * *

FOR CONTRACTOR:

Signature Date

Printed or Typed Name and Title

Signature Date

Printed or Typed Name and Title

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

* * * * * * *

This Contract is not valid or effectual for any purpose until approved by the appropriate authority designated below, and work is not authorized until the CONTRACTOR has been given notice to proceed by COUNTY'S Public Works Director.

FOR COUNTY:

Joseph T. Parisi, County Executive Date

Scott McDonell, County Clerk Date

AIA® Document A310™ – 2010

Bid Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

BOND AMOUNT:

PROJECT:
(Name, location or address, and Project number, if any)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

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

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this day of

(Witness)	*(Contractor as Principal)* *(Seal)*
	(Title)
(Witness)	*(Surety)* *(Seal)*
	(Title)

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

Init.
/

AIA® Document A312™ – 2010

Performance Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

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

AIA Document A312–2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

CONSTRUCTION CONTRACT
Date:

Amount:

Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)

Amount:

Modifications to this Bond: ☐ None ☐ See Section 16

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:	Name	Name and Title:	

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or **BROKER:**

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

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

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

.1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

.2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

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

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

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

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

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

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

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and

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

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

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

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

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

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

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

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

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

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address		Address	

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

AIA® Document A312™ – 2010

Payment Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT
Date:

Amount:

Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)

Amount:

Modifications to this Bond: ☐ None ☐ See Section 18

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:	Name	Name and Title:	

(Any additional signatures appear on the last page of this Payment Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)
AGENT or **BROKER:**

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

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

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

AIA Document A312–2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

.2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

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

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

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

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

- **.1** the name of the Claimant;
- **.2** the name of the person for whom the labor was done, or materials or equipment furnished;
- **.3** a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
- **.4** a brief description of the labor, materials or equipment furnished;
- **.5** the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- **.6** the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
- **.7** the total amount of previous payments received by the Claimant; and
- **.8** the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

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

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address		Address	

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

SECTION 00 72 12

GENERAL CONDITIONS OF CONTRACT

TABLE OF CONTENTS

1. CONSTRUCTION DOCUMENTS

A. Construction Documents, listed in Table of Contents of this Specification volume shall form part of this Contract and provisions of Construction Documents shall be as binding upon parties as if they were fully set forth in Contract itself.

B. These shall also be considered as part of Construction Documents: Addenda, including additions and modifications incorporated in such addenda before execution of Contract; requests for information; construction bulletins; change orders; and written interpretations by Architect / Engineer or Public Works Project Manager that are made after execution of Contract.

C. Construction Documents are complementary, and what is required by one shall be as binding as if required by all. Intent of Construction Documents is to include all labor, materials and equipment necessary for proper execution of the Work.

2. DEFINITIONS

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

3. ADDITIONAL INSTRUCTIONS AND DRAWINGS

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

4. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

A. Unless otherwise specified, Contractor shall submit three (3) copies of all Shop Drawings for each submission, until receiving final approval. After final approval, provide five (5) additional copies for distribution and such other copies as may be required.

B. Contractor shall submit, on an on-going basis and as directed, Product Data such as brochures that shall contain catalog cuts and specifications of all furnished mechanical and electrical equipment. After Architect / Engineer's approval, one (1) copy shall remain in Architect / Engineer's file, one (1) kept at Department's office and one (1) kept at job site by Contractor for reference purposes.

C. Samples shall consist of physical examples furnished by Contractor in sufficient size and quantity to illustrate materials, equipment or workmanship, and to establish standards to compare the Work.
   1. Submit Samples in sufficient quantity (minimum of two (2)) to permit Architect / Engineer to make all necessary tests and of adequate size showing quality, type, color range, finish, and texture. Label each Sample stating material, type, color, thickness, size, project name, and Contractor's name.
   2. Submit transmittal letter requesting approval, and prepay transportation charges to Architect / Engineer's office on samples forwarded.
   3. Materials installed shall match approved Samples.

D. Contractor shall review Shop Drawings and place their dated stamp thereon to evidence their review and approval and shall submit with reasonable promptness and in orderly sequence to cause no delay in the Work or in work of any other contractor. At time of submission, Contractor shall inform Architect / Engineer in writing of any deviation in Shop Drawings or Samples from requirements of Construction Documents. Architect / Engineer will not consider partial lists.

E. Architect / Engineer will review and approve or reject Shop Drawings with reasonable promptness to cause no delay. Architect / Engineer's approval shall not relieve Contractor from responsibility for errors or omissions in Shop Drawings.

F. Contractor shall not commence any work requiring Shop Drawing, Product Data or Sample submission until Architect / Engineer has approved submission. All such work shall be in accordance with approved Shop Drawings, Product Data and Samples.

G. Contractor shall keep on site of the Work, approved or conformed copy of Shop Drawings and shall at all times give Department access thereto.

H. By stamping and submitting Shop Drawings, Product Data and Samples, Contractor thereby represents that he or she has or will determine and verify all field measurements, field construction criteria, materials, catalog numbers, and similar data and that he or she has checked and coordinated each Shop Drawing, Product Data and Sample with requirements of the Work and of Construction Documents. Architect / Engineer shall return without examination, Shop Drawings, Product Data and Samples not so noted.

I. All Shop Drawings from any one Contractor should be numbered consecutively and on cover sheet shall bear name and location of project, name of Contractor, date of submittal and date of each correction or revision and associated Specification section and page number.

5. CUTTING AND PATCHING

A. Contractor shall be responsible for all cutting, fitting or patching required to complete the Work or to make its parts fit together properly.

B. Contractor shall not damage or endanger portion of the Work or fully or partially completed construction of County or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. Contractor shall not cut or otherwise alter such construction by County or separate contractor except with written consent of County and of such separate contractor; such consent shall not be unreasonably withheld. Contractor shall not withhold unreasonably from County or separate contractor, Contractor's consent to cutting or otherwise altering the Work.

6. CLEANING UP

A. Contractor shall keep premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under Contract. Contractor shall remove from and about the Work waste materials, rubbish, Contractor's tools, construction equipment, machinery, and surplus materials at completion of the Work. Contractor shall maintain streets and sidewalks around the Work site in clean condition. Contractor shall remove all spillage and prevent tracking of spillage arising from performance of the Work, into, out of, and within the Work site. Contractor shall establish regular maintenance program of sweeping, vacuuming and / or hosing to minimize accumulation of dirt and dust upon such areas.

B. If Contractor fails to clean up as directed in Construction Documents, County may do so and shall charge Contractor cost thereof.

C. Contractor shall be responsible for broken windows and glass, and at completion of the Work shall replace such damaged or broken windows and glass. After replacing damaged or broken windows and glass, Contractor shall remove all labels, wash and polish both sides of all windows and glass.

D. In addition to general cleaning (sweeping, vacuuming and / or hosing, as is appropriate to work surface), Contractor shall perform following final cleaning for all trades at completion of the Work:
   1. Remove temporary protections;
   2. Remove marks, stains, fingerprints and other soil or dirt from painted, decorated and finished woodwork and wall surfaces;
   3. Remove spots, plaster, soil and paint from ceramic tile, marble and other finished materials, and wash or wipe clean;
   4. Clean fixtures, cabinet work and equipment, removing stains, paint, dirt and dust, and leave same in undamaged, new condition;
   5. Clean aluminum in accordance with recommendations of manufacturer; and
   6. Clean resilient floors thoroughly with well-rinsed mop containing only enough moisture to clean off any surface dirt or dust and buff dry by machine to bring surfaces to sheen.

7. USE OF SITE

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

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

C. Contractor & subcontractors shall follow all current *Public Health - Madison & Dane County* procedures & recommendations including the mandatory use of face masks while inside any County facility. County Project Manager shall clarify these procedures & recommendations at pre-construction meeting.

8. MATERIALS AND WORKMANSHIP

A. Contractor shall perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, necessary to complete the Work required by this Contract, within time specified, in accordance with provisions of Construction Documents.

B. All equipment and materials incorporated in the Work covered by this Contract are to be new; use recycled and / or recovered materials to extent that such use is technically and economically feasible. Recovered materials are products recovered from solid waste in form identical to original form for use that is same as, or similar to original use. Recycled materials are products manufactured from solid waste.

C. If requested, Contractor shall furnish satisfactory evidence as to kind and quality of construction materials proposed or used. Contractor shall furnish to Architect / Engineer, for approval, manufacturer name and model, performance capacities and other pertinent information of machinery, mechanical, electrical or other types of equipment, which Contractor plans to install.

D. If not otherwise provided, materials and labor called for in this Contract shall be provided and performed in accordance with established practice and standards recognized by Architects, Engineers, Department, and construction industry.

E. Reference to "Standard" specifications of any association or manufacturer, or codes of County authorities, intends most recent printed edition or catalog in effect on date that corresponds with date of Construction Documents.

F. Whenever reference is made in Specifications that work shall be "performed", "applied", in accordance with "manufacturer's directions or instructions", Contractor to whom those instructions are directed shall furnish three (3) printed copies of such instructions to Architect / Engineer before execution of the Work.

9. CONTRACTOR'S TITLE TO MATERIALS

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

10. "OR EQUAL" CLAUSE

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

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

C. No request for approval of "or equal" materials will be entertained except from Contractor. Identify any request for substitution as substitution on Contractor's letter of transmittal and give reasons for substitution. Department may in its sole discretion allow substitutions of materials.

11. PATENTS AND ROYALTIES

A. If Contractor uses any design, device or material covered by letters, patent or copyright, it is mutually agreed and understood, that, without exception, contract prices shall include all royalties or costs arising from use of such design, device or materials, in any way involved in the Work.

B. Contractor shall indemnify and save harmless County from any and all claims for infringement by reason of use of such patent or copyright in connection with the Work agreed to be performed under this Contract, and shall indemnify County for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during prosecution of the Work or after completion of the Work.

12. SURVEYS, PERMITS, REGULATIONS AND TAXES

A. Department will furnish to Contractor all site, topography and property surveys necessary for execution of the Work.

B. Contractor shall procure and pay fees associated with all permits,, licenses and approvals necessary for execution of this Contract. This includes but is not limited to meter fees, parking and site logistics.

C. Contractor shall give all notices and comply with all State of Wisconsin, Federal and local laws, codes, rules and regulations relating to performance of the Work, protection of adjacent property, and maintenance of passageways, guard fences or other protective facilities.

D. Contractor does not need to pay State and local sales & use taxes on building materials that become part of local unit government facilities. See Wisconsin Statute 77.54 (9m). This does not include materials for highways, streets or roads. Contractor shall pay any other Sales, Consumer, Use & other similar taxes or fees required by law.

E. Contractor shall promptly notify Architect / Engineer of any variances of Drawings or Specifications with that of any State of Wisconsin, federal or local law, code, rule or regulation. Upon such notification, Architect / Engineer will require correction of variance to comply with applicable law, code, rule or regulation at no additional cost to Contractor.

F. Work under this Contract shall comply with all applicable State of Wisconsin, Federal and local laws, codes and regulations.

G. Contractor shall pay charges for water, sewer and other utility connections made by municipalities where required by Specifications.

13. CONTRACTOR'S OBLIGATIONS AND SUPERINTENDENCE

A. Contractor shall provide and pay for all materials, labor, tools, equipment, transportation and superintendence necessary to execute, complete and deliver the Work within specified time. Contractor agrees to secure at their own expense all personnel necessary to carry out the Work. Such personnel shall not be deemed County employees nor shall they have or be deemed to have any direct contractual relationship with County.

B. Performance of any work necessary after regular working hours, on Sundays or Legal Holidays shall be without additional expense to County. Performance of any work at site at other than normal working hours must be coordinated with Public Works Project Manager.

C. Contractor shall furnish, erect, maintain and remove such temporary works as may be required.

D. Contractor shall observe, comply with, and be subject to all terms, conditions, requirements and limitations of Construction Documents.

E. At the Work site, Contractor shall give personal superintendence to the Work or shall employ construction superintendent or foreman, experienced in character of work covered by Contract, who shall have full authority to act for Contractor. Understand that such superintendent or foreman shall be acceptable to Architect / Engineer and Department.

F. Remove from project or take other corrective action upon notice from Architect / Engineer or Department for Contractor's employees whose work is considered by Architect / Engineer or Department to be unsatisfactory, careless, incompetent, unskilled or otherwise objectionable.

G. Contractor and subcontractors shall be required to conform to Labor Laws of State of Wisconsin and various acts amendatory and supplementary thereto and to other laws, ordinances and legal requirements applicable to the Work.

H. Presence and observation of the Work by Architect / Engineer or Public Works Project Manager shall not relieve Contractor of any obligations.

14. WEATHER CONDITIONS

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

15. PROTECTION OF WORK AND PROPERTY

A. Contractor shall at all times safely guard County's property from injury or loss in connection with this Contract. Contractor shall at all times safely guard and protect the Work, and adjacent property, from damage. Contractor shall replace or make good any such damage, loss or injury unless such is caused directly by errors contained in Contract, or by County, or County's duly authorized representative.

B. Contractor may act diligently, without previous instructions from Architect / Engineer and / or Department, in emergency that threatens loss or injury of property, or safety of life. Contractor shall notify Architect / Engineer and / or Department immediately thereafter. Promptly submit any claim for compensation by Contractor due to such extra work to Architect / Engineer and / or Department for approval as provided for in Article 18 herein.

16. INSPECTION AND TESTING OF MATERIALS

A. Authorized representatives and agents of County government shall have access at all times to the Work wherever it is in preparation or progress and Contractor shall provide facilities for such access and for inspection.

B. Should it be considered necessary or advisable at any time before final acceptance of the Work to make examination of work already completed, by removing or tearing out same, Contractor shall upon request, promptly furnish all necessary facilities, labor and materials. If such work is found to be defective in any aspect, due to fault of Contractor or subcontractors thereof, Contractor shall assume all expenses of such examination and of satisfactory reconstruction. Contractor will be reimbursed for such examination and replacement in accordance with Article 18 - A.3., of these General Conditions of Contract if such work is found to meet requirements of Contract.

C. If Specifications, Architect / Engineer's, or Public Works Project Manager's instructions require any work to be specially tested or approved, Contractor shall give Architect / Engineer and Public Works Project Manager timely notice of its readiness for testing or inspection. Test all materials and equipment requiring testing in accordance with accepted or specified standards, as applicable. Architect / Engineer shall recommend laboratory or inspection agency and Department will select and pay for all initial laboratory inspection

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

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

17. REPORTS, RECORDS AND DATA

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

18. CHANGES IN THE WORK

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

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

h) On that portion of the Work under (3) done under subcontract, Contractor may include not over seven and one-half percent (7½%) for supervision, overhead, bond, profit, and any other general expense.

i) Contractor shall keep and present, in such form as directed, correct amount of cost together with such supporting vouchers as may be required by Department.

B. If Contractor claims that by any instructions given by Architect / Engineer, Department, by drawings or otherwise, regarding performance of the Work or furnishing of material under Contract, involves extra cost, Contractor shall give Department written notice of cost thereof within two (2) weeks after receipt of such instructions and in any event before proceeding to execute work, unless delay in executing work would endanger life or property.

C. No claim for extra work or cost shall be allowed unless it was done in pursuance of written Change Order from Architect / Engineer and approved by Department, as previously mentioned, and claim presented with payment request submitted after changed or extra work is completed.

D. Negotiation of cost for change in the Work shall not be cause for Contractor to delay prosecution of the Work if Contractor has been authorized in writing by Public Works Project Manager to proceed.

19. EXTRAS

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

20. TIME FOR COMPLETION

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

21. CORRECTION OF WORK

A. All work, all materials whether incorporated in the Work or not, and all processes of manufacture shall at all times and places be subject to inspection of Architect / Engineer and Public Works Project Manager who shall be judge of quality and suitability of the Work, materials, and processes of manufacture for purposes for which they are used. Should they fail to meet Architect / Engineer's and Public Works Project Manager's approval they shall be reconstructed, made good, replaced or corrected, by Contractor at Contractor's expense. Immediately remove all rejected material from site.

B. If Contractor defaults or neglects to carry out the Work in accordance with Construction Documents or fails to perform any provision of Contract, Department may, after ten (10) business days' written notice to Contractor and without prejudice to any other remedy County may have, make good such deficiencies. In such case, appropriate Change Order shall be issued deducting from Contractor's payments then or thereafter, cost of correcting such deficiencies, including cost of Architect / Engineer's additional services made necessary by such default, neglect or failure.

22. SUBSURFACE CONDITIONS FOUND DIFFERENT

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

23. RIGHT OF DEPARTMENT TO TERMINATE CONTRACT

A. In event that any provisions of this Contract are violated by Contractor or by any subcontractors, County may serve written notice upon Contractor and Surety of its intention to terminate Contract, such notice to contain reasons for such intention to terminate Contract, and unless within ten (10) business days after serving of such notice upon Contractor, such violation or delay shall cease and satisfactory arrangement or correction be made, Contract shall, upon expiration of said ten (10) business days, cease and terminate.

B. In event of any such termination, County shall immediately serve notice thereof upon Surety and Contractor, and Surety shall have right to take over and perform Contract subject to County's approval; provided, however, that if Surety does not commence performance thereof within ten (10) business days from date of mailing to such Surety of notice of termination, County may take over the Work and prosecute same to completion by contract, or by force account, at expense of Contractor; Contractor and Surety shall be liable to County for any excess cost occasioned County thereby, and in such event County may take possession of and utilize in completing the Work, such materials and equipment as may be on the Work site and therefore necessary.

24. CONSTRUCTION SCHEDULE AND PERIODIC ESTIMATES

A. Contractor shall be responsible for Construction Schedule and coordination. Immediately after execution and delivery of Contract and before making first payment, Contractor shall notify all subcontractors to furnish all required information to develop Construction Schedule. Contractor and all subcontractors associated with the Work shall furnish following information from each Division of Specifications:
   1. List of construction activities;
   2. Start, finish and time required for completion of each activity;
   3. Sequential relationships between activities;
   4. Identify all long lead-time items, key events, meetings or activities such as required submittals, fabrication and delivery, procurement of materials, installation and testing;
   5. Weekly definition of extent of work and areas of activity for each trade or Subcontract; and
   6. Other information as determined by Public Works Project Manager.

B. In addition to above requested items, Contractor shall request delivery dates for all County-furnished equipment, materials or labor. This shall include any work handled by Department under separate contracts such as asbestos abatement, air and water balancing, etc. Indicate on Construction Schedule these associated delivery and installation dates.

C. Progress Reporting:

1. Contractor shall update and publish Construction Schedule on monthly basis. Revisions to Schedule shall be by Contractor and made in same detail as original Schedule and accompanied by explanation of reasons for revision; and shall be subject to approval by Department.
2. Failure of Contractor to keep Schedule in updated format shall result in County hiring firm specializing in construction schedule development and deducting those costs associated with updating process from payments due Contractor.
3. Contractor shall submit show actual percentage of each activity completed, estimated future progress, and anticipated completion time.

D. Responsibility for timely completion requires:
   1. Contractor and subcontractors understand that performance of each is interdependent upon performance of others.
   2. Whenever it becomes apparent from current schedule, that phasing or progress completion dates will not be met, Contractor must take some or all following actions at no additional cost to County:
      a) Increase construction labor in such quantities and crafts as will eliminate backlog of work.
      b) Increase number of working hours per shift, shifts per working day, working days per week, amount of construction equipment, or any combination of foregoing to eliminate backlog of work.
      c) Reschedule work (yet remain in conformance with Drawings and Specifications).
   3. Prior to proceeding with any of above actions, Contractor shall notify Public Works Project Manager.

E. Maintain current Construction Schedule at all times. Revise Construction Schedule in same detail as original and accompany with explanation of reasons for revision. Schedule shall be subject to approval by Architect / Engineer and Public Works Project Manager.

25. PAYMENTS TO CONTRACTOR

A. Contractor shall provide:
   1. Detailed estimate giving complete breakdown of contract price by Specification Division; and
   2. Periodic itemized estimates of work done for purpose of making partial payments thereon.

B. Submit these estimates for approval first to Architect / Engineer, then to Public Works Project Manager. Costs employed in making up any of these schedules are for determining basis of partial payments and not considered as fixing basis for additions to or deductions from Contract price.

C. County will make partial payments to Contractor for value, proportionate to amount of Contract, of all labor and material incorporated in the Work during preceding calendar month upon receipt of Application and Certificate for Payment form from Architect / Engineer and approval of Department.

D. Contractor shall submit for approval first to Architect / Engineer, and then to Public Works Project Manager all Application and Certificate for Payment forms. If requested, Application and Certificate for Payment shall be supported by such additional evidence as may be required, showing Contractor's right to payment claimed.

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

F. Payments by County will be due within forty-five (45) business days after receipt by Department of Application and Certificate for Payment.

G. County will retain five percent (5%) of each Application and Certificate for Payment until final completion and acceptance of all the Work covered by Contract. However, anytime after fifty percent (50%) of the Work has been furnished and installed at site, County will make remaining payments in full if Architect / Engineer and Public Works Project Manager find that progress of the Work corresponds with Construction Schedule. If Architect / Engineer and Public Works Project Manager find that progress of the Work does not correspond with Construction Schedule, County may retain up to ten percent (10%) of each Application and Certificate for Payment for the Work completed.

H. All material and work covered by partial payments made shall become sole property of County, but this provision shall not be construed as relieving Contractor from sole responsibility for care and protection of materials and work upon which payments have been made, or restoration of any damaged work, or as waiver of right of County to require fulfillment of all of terms of Contract.

I. County will make final payment within sixty (60) calendar days after final completion of the Work, and will constitute acceptance thereof.

J. County may make payment in full, including retained percentages and less authorized deductions, upon completion and acceptance of each Division where price is stated separately in Contract.

K. Every contractor engaged in performance of any contract for Department of Public Works, Highway & Transportation shall submit to this Department, as requested and with final application for payment for work under said contract, affidavit(s) as required to prove that all debts and claims against this Work are paid in full or otherwise satisfied, and give final evidence of release of all liens against the Work and County.

26. WITHHOLDING OF PAYMENTS

A. County, after having served written notice on said Contractor, may either pay directly any unpaid bills of which Department has written notice, or withhold from Contractor's unpaid compensation sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged; whereupon, payment to Contractor shall be resumed in accordance with terms of this Contract, but in no event shall these provisions be construed to impose any obligations upon County to either Contractor or Contractor's Surety.

B. In paying any unpaid bills of Contractor, County shall be deemed agent of Contractor, and any payment so made by County, shall be considered as payment made under Contract by

County to Contractor and County shall not be liable to Contractor for any such payment made in good faith.

C. Contractor shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives from all claims growing out of lawful demands of subcontractors, laborers, workers, mechanics, material men, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in performance of this Contract.

D. At Department's request, Contractor shall furnish satisfactory evidence that all obligations of nature designated above have been paid, discharged or waived.

27. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

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

B. Acceptance of final payment shall constitute waiver of all claims by Contractor.

28. PAYMENTS BY CONTRACTOR

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

29. CONTRACT SECURITY

A. Contractor shall furnish Performance and Payment Bonds in amount at least equal to one hundred percent (100%) of Contract price as security for faithful performance of this Contract and payment of all persons performing labor on project under this Contract and furnishing materials in connection with this Contract.

B. Sample Performance and Payment Bonds that Contractor will be required to execute is bound into these Construction Documents. Before construction Contract is consummated, completed Performance and Payment Bonds must be approved by Department.

30. ASSIGNMENTS

A. Contractor shall not assign whole or any part of this Contract or any moneys due or to become due hereunder without written consent of Department. In case Contractor assigns all or any part of any moneys due or to become due under this Contract, instrument of assignment shall contain clause substantially to effect that it is agreed that right of assignee in and to any moneys due or to become due to Contractor shall be subject to prior claims of all

persons, firms and corporations for services rendered or materials supplied for performance of the Work called for in this Contract.

31. MUTUAL RESPONSIBILITY OF CONTRACTORS

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

32. SEPARATE CONTRACTS

A. Department may award other contracts for the Work and all Contractors shall fully cooperate with each other and carefully adjust their work to that provided under other contracts as may be directed by Department. No Contractor shall commit or permit any act that will interfere with performance of the Work by any other Contractor.

B. Contractor shall coordinate the Work with those of other Contractors. Cooperation will be required in arrangement for storage of materials and in detailed execution of the Work. Contractor, including subcontractors, shall keep informed of progress and detail work of others and shall notify Architect / Engineer or Department immediately of lack of progress or defective workmanship on part of others. Failure of Contractor to keep informed of the Work progressing on site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by Contractor of status of the Work as being satisfactory for proper coordination with Contractor's own work.

33. SUBCONTRACTS

A. Contractor may use services of specialty subcontractors on those parts of the Work that, under normal contracting practices, are performed by specialty subcontractors.

B. Contractor shall not award any work to any subcontractor without prior approval of Department. Qualifications of subcontractors shall be same as qualifications of Contractor. Request for subcontractor approval shall be submitted to Department fifteen (15) business days before start of subcontractor's work. If subcontractors are changed or added, Contractor shall notify Department in writing.

C. Contractor shall be as fully responsible to County for acts and omissions of subcontractors, and of persons either directly or indirectly employed by them, as Contractor is for acts and omissions of persons directly employed by Contractor.

D. Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the Work to bind subcontractors to Contractor by terms of General Conditions of Contract and other Construction Documents insofar as applicable to work of subcontractors and to give Contractor same power as regards terminating any subcontract that Department may exercise over Contractor under any provision of Construction Documents.

E. Nothing contained in this Contract shall create any contractual relation between any subcontractor and County.

F. Contractor shall insert in all subcontracts, Articles 26, 33, 43 and 45, respectively entitled: "Withholding of Payments", "Subcontracts", "Affirmative Action Provision and Minority / Women / Disadvantaged Business Enterprises", and "Minimum Wages", and shall further require all subcontractors to incorporate physically these same Articles in all subcontracts.

34. PROJECT MANAGER'S AUTHORITY

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

35. CONSULTANT'S AUTHORITY

A. Architect / Engineer is retained by, and is responsible to Department acting for County.

B. Architect / Engineer shall determine amount, quality, acceptability, and fitness of several kinds of work and materials that are provided under this Contract and shall decide all questions that may arise in relation to said work and construction thereof.

C. Architect / Engineer shall decide meaning and intent of any portion of Specifications and of any Drawings where they may be found obscure or be in dispute.

D. Architect / Engineer shall provide responsible observation of construction. Architect / Engineer has authority to stop the Work whenever such stoppage may be necessary to insure proper execution of Construction Documents.

E. Architect / Engineer shall be interpreter of conditions of Construction Documents and judge of its performance.

F. Within reasonable time, Architect / Engineer shall make decisions on all matters relating to progress of the Work or interpretation of Construction Documents.

G. Architect / Engineer's decisions are subject to review by Public Works Project Manager.

36. STATED ALLOWANCES

A. Stated allowances enumerated in Instructions to Bidders shall cover net cost of materials or equipment, and all applicable taxes. Contractor's cost of delivery and unloading at site, handling costs on site, labor, installation costs, overhead, profit and any other incidental costs shall be included in Contractor's bid, but not as part of cash allowance.

B. Department will solicit at least two (2) bids on materials or equipment for which allowance is stated and select on basis of lowest qualified responsible bid. Contractor will then be instructed to purchase "Allowed Materials". If actual price for purchasing "Allowed Materials", including taxes, is more or less than "Cash Allowance", Contract price shall be adjusted accordingly. Adjustment in Contract price shall not contain any cost items excluded from cash allowance.

37. ESTIMATES OF QUANTITIES

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

38. LANDS AND RIGHTS-OF-WAY

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

39. GENERAL GUARANTEE

A. Neither final certificate of payment nor any provision in Construction Documents nor partial or entire occupancy of premises by County shall constitute acceptance of work not done in accordance with Construction Documents or relieve Contractor of liability in respect to any expressed warranties or responsibility for faulty materials or workmanship.
   1. In no event shall making of any payment required by Contract constitute or be construed as waiver by County of any breach of covenants of Contract or waiver of any default of Contractor and making of any such payment by County while any such default or breach shall exist shall in no way impair or prejudice right of County with respect to recovery of damages or other remedy as result of such breach or default.

B. Contractor shall remedy and make good all defective workmanship and materials and pay for any damage to other work resulting there from, which appear within period of one (1) year from date of substantial completion, providing such defects are not clearly due to abuse or misuse by County. Department will give notice of observed defects with reasonable promptness.

C. Guarantee on work executed after certified date of substantial completion will begin on date when such work is inspected and approved by Architect / Engineer's and Public Works Project Manager.

D. Where guarantees or warrantees are required in sections of Specifications for periods in excess of one (1) year, such longer terms shall apply; however, Contractor's Performance and Payment Bonds shall not apply to any guarantee or warranty period in excess of one (1) year.

40. CONFLICTING CONDITIONS

A. Any provision in any of Construction Documents which may be in conflict or inconsistent with any Articles in these General Conditions of Contract or Supplementary Conditions shall be void to extent of such conflict or inconsistency.

B. In case of ambiguity or conflict between Drawings and Specifications, Specifications shall govern.

C. Printed dimensions shall be followed in preference to measurements by scale. Large-scale drawings take precedence over small-scale drawings. Dimensions on Drawings and details are subject to field measurements of adjacent work.

41. NOTICE AND SERVICE THEREOF

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

42. PROTECTION OF LIVES AND HEALTH

A. In order to protect lives and health of Contractor's employees under Contract, Contractor shall comply with all pertinent provisions of Wisconsin Administrative Code, Rules of Department of Commerce, relating to Safety and Health.

B. Contractor alone shall be responsible for safety, efficiency and adequacy of Contractor's tools, equipment and methods, and for any damage that may result from their failure or their improper construction, maintenance or operation.

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

A. Affirmative Action Provisions.
   1. During term of their Contract, Contractor agrees not to discriminate on basis of race, religion, color, sex, handicap, age, sexual preference, marital status, physical appearance, or national origin against any person, whether recipient of services (actual or potential), employee, or applicant for employment. Such equal opportunity shall include but not be limited to following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, rates of pay, and any other form of compensation or level of service(s). Contractor agrees to post in conspicuous places, these affirmative action standards so as to be visible to all employees, service recipients and applicants for this paragraph. Listing of prohibited bases for discrimination shall no be construed to amend in any fashion state or federal law setting forth additional bases and exceptions shall be permitted only to extent allowable in state or federal law.
   2. Contractor is subject to this Article only if Contractor has twenty (20) or more employees and receives $20,000.00 or more in annual aggregate contracts with County. Contractor shall file and Affirmative Action Plan with Dane County Contract Compliance Specialist in accord with Chapter 19 of Dane County Code of Ordinances. Such plan must be filed within fifteen (15) business days of effective date of this Contract and failure to do so by said date shall constitute ground for immediate termination of Contract by County. Contractor shall also, during term of this Contract, provide copies of all announcements of employment opportunities to County's Office of Equity & Inclusion, and shall report annually number of persons, by race, sex and handicap status, who apply for employment, and, similarly classified, number hired and number rejected.

3. Contact Dane County Contract Compliance Specialist at Dane County Office of Equity & Inclusion, 210 Martin Luther King, Jr. Blvd., Room 356, Madison, WI 53703, 608/266-4192.
4. In all solicitations for employment placed on Contractor's behalf during term of this Contract, Contractor shall include statement to affect Contractor is "Equal Opportunity Employer". Contractor agrees to furnish all information and reports required by County's Contract Compliance Specialist as same relate to affirmative action and nondiscrimination, which may include any books, records, or accounts deemed appropriate to determine compliance with Chapter 19, Dane County Code of Ordinances, and provision of this Contract.

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

44. COMPLIANCE WITH FAIR LABOR STANDARDS

A. During term of this Contract, Contractor shall report to County Contract Compliance Specialist, within ten (10) business days, any allegations to, or findings by National Labor Relations Board (NLRB) or Wisconsin Employment Relations Commission (WERC) that Contractor has violated statute or regulation regarding labor standards or relations. If investigation by Contract Compliance Specialist results in final determination that matter adversely affects Contractor's responsibilities under this Contract, and which recommends termination, suspension or cancellation of this Contract, County may take such action.

B. Contractor may appeal any adverse finding by Contract Compliance Specialist as set forth in Dane County Ordinance 25.015(11)(c) through (e).

C. Contractor shall post this statement in prominent place visible to employees: "As condition of receiving and maintaining contract with Dane County, this employer shall comply with federal, state and all other applicable laws prohibiting retaliation or union organizing."

45. USE AND OCCUPANCY PRIOR TO ACCEPTANCE

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

46. CLAIMS

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

47. ANTITRUST AGREEMENT

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

48. INSURANCE

A. Contractor Carried Insurance:
   1. Contractor shall not commence work under this Contract until Contractor has obtained all insurance required under this Article and has provided evidence of such insurance to Risk Manager, 425 City-County Building, 210 Martin Luther King Jr. Blvd., Madison, WI 53703. Contractor shall not allow any subcontractor to commence work until insurance required of subcontractor has been so obtained and approved. Company providing insurance must be licensed to do business in Wisconsin.
   2. Worker's Compensation Insurance:
      a) Contractor shall procure and shall maintain during life of this Contract, Worker's Compensation Insurance as required by statute for all of Contractor's employees engaged in work at site of project under this Contract and, in case of any such work sublet, Contractor shall require subcontractor similarly to provide Worker's Compensation Insurance for all of latter's employees to be engaged in such work unless such employees are covered by protection afforded by Contractor's Worker's Compensation Insurance.
      b) If any claim of employees engaged in hazardous work on project under this Contract is not protected under Worker's Compensation Statute, Contractor shall provide and shall cause each subcontractor to provide adequate Employer's Liability Insurance for protection of such of Contractor's employees as are not otherwise protected.
   3. Contractor's Public Liability and Property Damage Insurance:
      a) Contractor shall procure and maintain during life of this Contract, Contractor's Public Liability Insurance and Contractor's Property Damage Insurance in amount not less than $1,000,000 bodily injury, including accidental death, to any one person, and subject to same limit for each person, in amount not less than $1,000,000 on account of one accident, and Contractor's Property Damage Insurance in amount not less then $1,000,000 or combined single limit of at least $1,000,000 with excess coverage over and above general liability in amount not less than $5,000,000. Contractor shall add "Dane County" as additional insured for each project.
      b) Contractor's Public Liability and Property Damage Insurance shall include Products, Completed Operation, and Contractual Liability under Insurance Contract. "Contractor shall in all instances save, defend, indemnify and hold harmless County and Architect / Engineer against all claims, demands, liabilities, damages or any other costs which may accrue in prosecution of the Work and that Contractor will save, defend, indemnify and hold harmless County and Architect / Engineer from all

damages caused by or as result of Contractor's operations" and each shall be listed as additional insured on Contractor's and subcontractors' insurance policies.

c) Obligations of Contractor under Article 50.A.2.b) shall not extend to liability of Architect / Engineer, agents or employees thereof, arising out of:
   1) Preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications; or
   2) Giving of or failure to give directions or instructions by Architect / Engineer, agents or employees thereof provided such giving or failure to give is primary cause of injury or damage.

d) Contractor shall procure and shall maintain during life of this Contract, Comprehensive Automobile Liability Insurance covering owned, non-owned and hired automobiles for limits of not less than $1,000,000 each accident single limit, bodily injury and property damage combined with excess coverage over and above general liability in amount not less than $5,000,000.

e) Contractor shall either:
   1) Require each subcontractor to procure and to maintain during life of subcontract, subcontractor's Public Liability Property Damage Insurance, and Comprehensive Automobile Liability Insurance of type and in same amount specified in preceding paragraphs; or
   2) Insure activities of subcontractors in Contractor's own policy.

4. Scope of Insurance and Special Hazards: Insurance required under Article 50.A.2 & 50.A.3. hereof shall provide adequate protection for Contractor and subcontractors, respectively, against damage claims which may arise from operations under this Contract, whether such operation be by insured or by anyone directly or indirectly employed by insured and also against any of special hazards which may be encountered in performance of this Contract as enumerated in Supplementary Conditions.
5. Proof of Carriage of Insurance: Contractor shall furnish Risk Manager with certificates showing type, amount, class of operations covered, effective dates, dates of expiration of policies and "Dane County" listed as additional insured. Such certificates shall also contain (substantially) following statement: "Insurance covered by this certificate will not be canceled or materially altered, except after ten (10) business days written notice has been received by Risk Manager."

B. Builder's Risk:
   1. County shall provide Builder's Risk insurance coverage for its insurable interests in construction or renovation projects with completed value of $1,000,000 or less. Therefore, if project completed value is more than $1,000,000, Contractor shall obtain and maintain in force, at its own expense, Builder's Risk Insurance on all risks for amount equal to full completed value of covered structure or replacement value of alterations or additions. Any deductible shall not exceed $25,000 for each loss. Policy shall include occupancy clause and list Dane County as loss payee.

C. Indemnification / Hold Harmless:
   1. Contractor shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives from and against all claims, damages, losses and expenses including attorneys' fees arising out of or resulting from performance of the Work, provided that any such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting therefrom, and is caused in whole or in part by any act or omission of Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by part indemnified hereunder.

2. In any and all claims against Dane County, its boards, commissions, agencies, officers, employees and representatives or by any employee of Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, indemnification obligation under this Contract shall not be limited in any way by any limitation on amount or type of damages, compensation or benefits payable by or for Contractor or any subcontractor under worker's compensation acts, disability benefits or other employee benefit acts.
3. Obligations of Contractor under this Contract shall not extend to liability of Architect / Engineer, its agents or employees arising out of:
    a) Preparation or approval of maps, drawings, opinion, reports, surveys, change orders, designs or specifications; or
    b) Giving of or failure to give directions or instruction by Architect / Engineer, its agents or employees provided such giving or failure to give is primary cause of injury or damage.
4. Dane County shall not be liable to Contractor for damages or delays resulting from work by third parties or by injunctions or other restraining orders obtained by third parties.

49. WISCONSIN LAW CONTROLLING

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

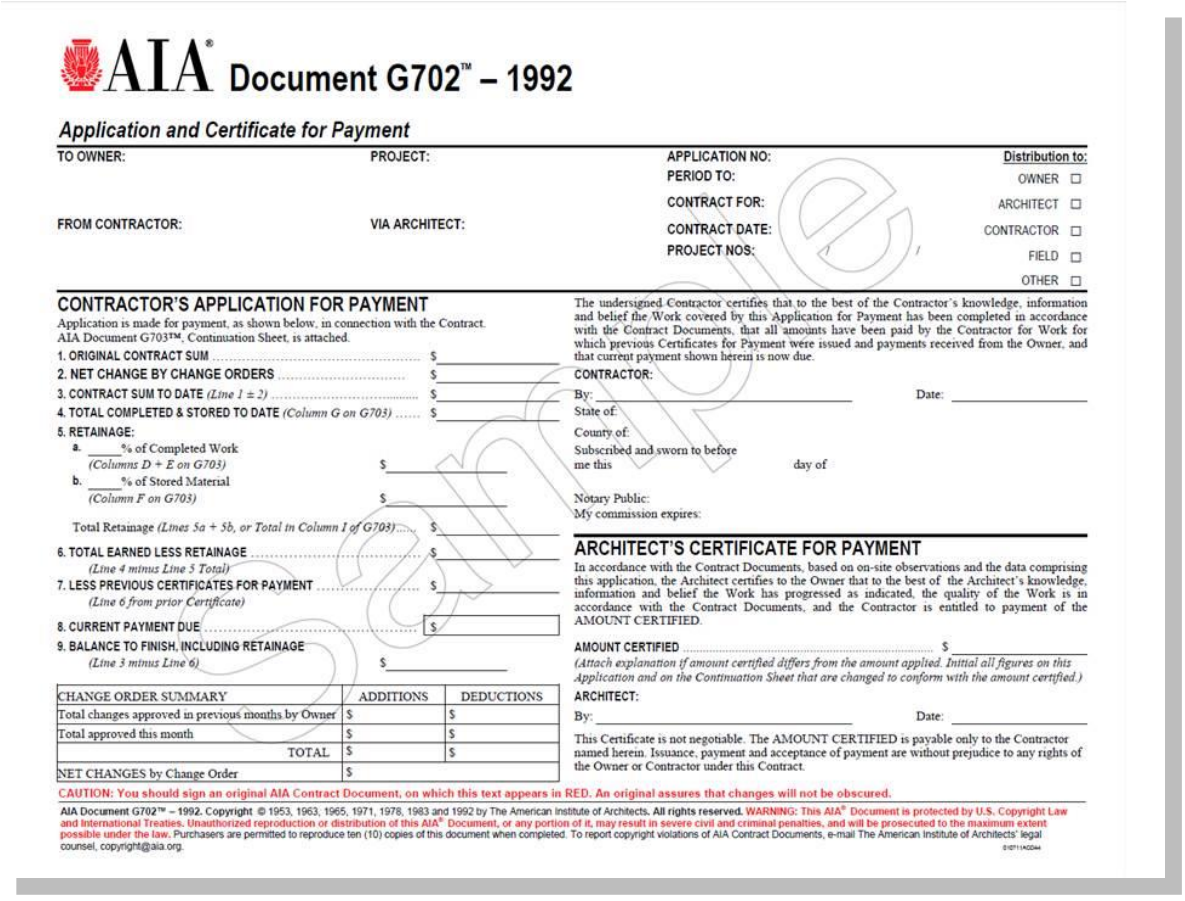
END OF SECTION

SECTION 00 73 00

SUPPLEMENTARY CONDITIONS

1. APPLICATION & CERTIFICATE FOR PAYMENT

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



AIA® Document G702™ – 1992

Application and Certificate for Payment

TO OWNER: PROJECT: APPLICATION NO: Distribution to:
PERIOD TO: OWNER ☐
CONTRACT FOR: ARCHITECT ☐
FROM CONTRACTOR: VIA ARCHITECT: CONTRACT DATE: CONTRACTOR ☐
PROJECT NOS: / / FIELD ☐
OTHER ☐

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
AIA Document G703™, Continuation Sheet, is attached.

1. ORIGINAL CONTRACT SUM ..... $
2. NET CHANGE BY CHANGE ORDERS ..... $
3. CONTRACT SUM TO DATE *(Line 1 ± 2)* ..... $
4. TOTAL COMPLETED & STORED TO DATE *(Column G on G703)* ..... $
5. RETAINAGE:
   a. ____% of Completed Work *(Columns D + E on G703)* $
   b. ____% of Stored Material *(Column F on G703)* $
   Total Retainage *(Lines 5a + 5b, or Total in Column I of G703)* ..... $
6. TOTAL EARNED LESS RETAINAGE ..... $ *(Line 4 minus Line 5 Total)*
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT ..... $ *(Line 6 from prior Certificate)*
8. CURRENT PAYMENT DUE ..... $
9. BALANCE TO FINISH, INCLUDING RETAINAGE *(Line 3 minus Line 6)* $

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$	$
Total approved this month	$	$
TOTAL	$	$
NET CHANGES by Change Order	$	

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

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

ARCHITECT'S CERTIFICATE FOR PAYMENT

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

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

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

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

AIA® Document G703™ – 1992

Continuation Sheet

AIA Document G702™–1992, Application and Certificate for Payment, or G732™–2009, Application and Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached.
In tabulations below, amounts are in US dollars.
Use Column I on Contracts where variable retainage for line items may apply.

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

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED: FROM PREVIOUS APPLICATION (D + E)	WORK COMPLETED: THIS PERIOD	MATERIALS PRESENTLY STORED (Not in D or E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C – G)	RETAINAGE (If variable rate)
	GRAND TOTAL								

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

2. INSURANCE

A. Not Applicable.

END OF SECTION

SECTION 00 73 00

BEST VALUE CONTRACTING

1. CONTRACTORS / LICENSURE APPLICANTS

The Dane County Department of Public Works requires contractors & subcontractors to be a Best Value Contractor (BVC) before being hired. Contractor & subcontractor application documents should be turned in immediately. Contractor approval or exemption must be complete prior to Bid Due Date / Time. All subcontractors must also be approved or prove their exemption ten (10) business or more days before performing any work under a County contract. This document shall be completed, properly executed, along with the necessary attachments and additional information that the County requires for the protection and welfare of the public in the performance of a County contract.

Contractors or subcontractors of any tier who attain qualification status will retain that status for a period of three (3) years from the date of qualification. Contractors shall notify the Dane County Department of Public Works, Highway & Transportation within fifteen (15) days of any changes to its business or operations that are relevant to the application or status. Failure to do so could result in suspension, revocation of the contractor's qualification, debarment from County contracts for up to three (3) years and / or other sanctions available under the law.

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

Fill out the BVC Application at the Public Works Engineering Division web site (publicworks.countyofdane.com/bvc). This document is only provided in the RFB for reference. The following page shows what the questions are on the application.

2. EXEMPTIONS TO QUALIFICATION

Contractors performing work that does not apply to an apprenticeable trade, as outlined in Item 4. Apprenticeable Trades, is the only reason for claiming an exemption if not an active Wisconsin Trades Trainer. See Question 18A.

3. APPLICATION QUESTIONS

NO.	PROOF OF RESPONSIBILITY	CHECK IF APPLICABLE
1	Does your firm acknowledge that in doing work under any County Public Works Contract, it will be required to use as subcontractors only those contractors that are also qualified with the County or become so ten (10) or more days before beginning any work?	Yes: ☐ No: ☐
2	Does your firm possesses all technical qualifications and resources, including equipment, personnel and financial resources, necessary to perform the work required for any project or obtain the same through the use of responsible, qualified subcontractors?	Yes: ☐ No: ☐
3	Will your firm possess all valid, effective licenses, registrations or certificates required by federal, state, county, or local law, which are necessary for the type of work to be performed including, but not limited to, those for any type of trade work or specialty work?	Yes: ☐ No: ☐

4	Will your firm meet all bonding requirements as required by applicable law or contract specifications?	Yes: ☐ No: ☐
5	Will your firm meet all insurance requirements as required by applicable law or specifications, including general liability insurance, workers compensation insurance and unemployment insurance requirements?	Yes: ☐ No: ☐
6	Will your firm maintain a substance abuse policy for employees hired for public works contracts that comply with Wis. Stats. Sec. 103.503?	Yes: ☐ No: ☐
7	Will your employees who will perform work on a Public Works project all be covered under a current workers compensation policy and be properly classified under such policy?	Yes: ☐ No: ☐
8	Will your employees who will perform work on a Public Works project have the opportunity to enroll in minimum essential coverage and not be subject to an enrollment period of more than 60 days per the federal Affordable Care Act, Sec. 1513?	Yes: ☐ No: ☐
9	Will your firm fully abide by the equal opportunity and affirmative action requirements of all applicable laws, including County ordinances?	Yes: ☐ No: ☐
10	Has your firm been the subject of any order or judgement from any State or Federal Agency or court concerning employment practice, including but not limited to: classification of employees under state unemployment or workers compensation laws; minimum wage, overtime pay, recordkeeping, and child labor standards imposed by federal or state law; and employment discrimination or unfair labor practices prohibited by federal or state law. (Attach copies of any order or judgement)	Yes: ☐ No: ☐ If Yes, attach details.
11	Is your firm authorized or registered to transact business in the state by the Department of Financial Institutions in compliance with Wis. Stat. Chaps. 178, 179, 180, 181, or 183?	Yes: ☐ No: ☐ If Yes, attach details.
12	In the past three (3) years, has your firm had control or has another corporation, partnership or other business entity operating in the construction industry controlled it? If so, please attach a statement explaining the nature of the firm relationship?	Yes: ☐ No: ☐ If Yes, attach details.
13	In the past three (3) years, has your firm had any type of business, contracting or trade license, certification or registration revoked or suspended?	Yes: ☐ No: ☐ If Yes, attach details.
14	In the past three (3) years, has your firm been debarred by any federal, state or local government agency?	Yes: ☐ No: ☐ If Yes, attach details.
15	In the past three (3) years, has your firm defaulted or failed to complete any contract?	Yes: ☐ No: ☐ If Yes, attach details.
16	In the past three (3) years, has your firm committed a willful violation of federal, state or local government safety laws as determined by a final decision of a court or government agency authority.	Yes: ☐ No: ☐ If Yes, attach details.
17	In the past three (3) years, has your firm been in violation of any law relating to your contracting business where the penalty for such violation resulted in the imposition of a penalty greater than $10,000?	Yes: ☐ No: ☐ If Yes, attach details.
18	Is your firm an active Wisconsin Trade Trainer as determined by the Wisconsin Bureau of Apprenticeship Standards?	Yes: ☐ No: ☐ If Yes, attach details.

18A	Is your firm claiming an exemption to qualification?	Yes: ☐ No: ☐ If Yes, attach details.
19	Contractor has been in business less than one year?	Yes: ☐ No: ☐

4. APPRENTICEABLE TRADES:

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

END OF SECTION

SECTION 00 73 11

FAIR LABOR PRACTICES CERTIFICATION

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

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

B. That BIDDER, APPLICANT or PROPOSER has (check one):

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

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

_____ _____

Officer or Authorized Agent Signature | Date

_____

Printed or Typed Name and Title

_____

Printed or Typed Business Name

NOTE: You can find information regarding the violations described above at: www.nlrb.gov and werc.wi.gov.

For reference, Dane County Ordinance 25.09 is as follows:

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

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

Include this completed Certification with your bid, application or proposal.

END OF SECTION

SECTION 01 00 00

GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

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

40. As-Built and Record Drawings and Specifications

1.2 SUMMARY OF THE WORK

A. Project Description: Perform the Work as specified and detailed in Construction Documents package. Contractor to provide facility improvements to McCarthy Park.

B. Work by Owner: Not applicable.

C. Permits: Prior to commencement of the Work, Contractor to secure any and all necessary permits for completion of the Work and facility occupancy. Provide Public Works Project Manager with copies of all permits.

1.3 CONTRACTOR USE OF PREMISES

A. Limit use of premises to allow work by others and work by Owner.

B. Coordinate utility outages and shutdowns with Owner.

C. Contractors or Subcontractors shall not visit the site if they are or have recently been ill.

1.4 APPLICATIONS FOR PAYMENT

A. Submit each Application for Payment on AIA G702™ and G703™ forms or approved contractors invoice form. Contractor shall have these forms notarized and signed.

B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

C. Payment Period: Monthly.

D. Submit Applications for Payment to Public Works Project Manager for approval & processing for payment.

1.5 CHANGE PROCEDURES

A. Contractor's costs for Products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from contingency allowance.

1.6 ALTERNATES

A. Owner shall review and accept or reject alternates quoted on Bid Form.

B. Coordinate related work and modify surrounding work as required.

C. Schedule of Alternates: there are no alternates proposed for this project.

1.7 LUMP SUM ALLOWANCES FOR WORK

A. Not Applicable.

1.8 COORDINATION

A. Coordinate scheduling, submittals, and work of various sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements.

B. Verify utility requirement characteristics of operating equipment are compatible with building utilities.

C. Coordinate space requirements and installation of mechanical and electrical work indicated diagrammatically on Drawings.

D. Contractor shall provide Public Works Project Manager with work plan that ensures the Work's completion within required time & schedule.

E. Public Works Project Manager may choose to photograph or videotape site or workers as the Work progresses.

1.9 CUTTING AND PATCHING

A. Employ skilled and experienced installer to perform cutting and patching new work; restore work with new Products.

B. Submit written request in advance of cutting or altering structural or building enclosure elements.

C. Fit work tight to adjacent elements. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

D. Refinish surfaces to match adjacent finishes.

1.10 CONFERENCES

A. Project shall have pre-bid conference; see Instructions to Bidders.

B. Owner will schedule preconstruction conference after Award of Contract for all affected parties.

C. Contractor shall submit Construction Schedule at pre-construction meeting.

D. When required in individual Specification section, convene pre-installation conference at project site prior to commencing work of Section.

E. Safe distancing & facemasks are required for all conference attendees. In-person conferences will be limited to 10 people; please limit number of attending staff &

subcontractors. If there are more than 10 people, we will split group & there will be two or more conferences. Allow sufficient time if you do not make it in to first group.

1.11 PROGRESS MEETINGS

A. Day & time of progress meetings to be determined at pre-construction meeting.

B. General Contractor shall schedule and administer meetings throughout progress of the Work at minimum of one (1) per week with Public Works Project Manager, involved Dane County staff & other individuals as required.

C. General Contractor shall preside at meetings, record minutes, and distribute copies within two (2) business days to those attending & those affected by decisions made.

D. Attendance at progress meetings by General Contractor, subcontractors, or their authorized representative, is mandatory.

E. Contractors shall give verbal reports of progress on the Work, discuss schedule for upcoming period and present all conflicts, discrepancies or other difficulties for resolution.

F. In-person meetings shall be limited & shall follow current *Public Health - Madison & Dane County* procedures & recommendations (see publichealthmdc.com/documents/office_space_checklist.pdf and publichealthmdc.com/coronavirus/forward-dane/current-order). Whenever possible, hold meetings via teleconference or videoconference, to be hosted by contractor or consultant. Dane County reserves right to mandate safe physical distancing & use of facemasks by all personnel while inside any County facility or on any County grounds.

1.12 JOB SITE ADMINISTRATION

A. Contractor shall have project superintendent on site minimum of eight (8) hours per week during progress of the Work.

B. Contractor shall not change their project superintendent or project manager for duration of the Work without written permission of Public Works Project Manager.

C. Architect / Engineer shall have representative on site regularly during progress of the Work.

1.13 SUBMITTAL PROCEDURES

A. Submittal form to identify Project, Contractor, Subcontractor or supplier; and pertinent Construction Documents references.

B. Apply Contractor's stamp, signed or initialed, certifying that review, verification of Products required, field dimensions, adjacent construction work, and coordination of information is in accordance with requirements of the Work and Construction Documents.

C. Identify variations from Construction Documents and Product or system limitations that may be detrimental to successful performance of completing the Work.

D. Revise and resubmit submittals as required; identify all changes made since previous submittal.

1.14 PROPOSED PRODUCTS LIST

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

1.15 SHOP DRAWINGS

A. Submit number of copies that Contractor & Architect / Engineer require, plus one (1) copy that shall be retained by Public Works Project Manager.

1.16 PRODUCT DATA

A. Submit number of copies that Contractor requires, plus one (1) copy that shall be retained by Public Works Project Manager.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this Project.

1.17 SAMPLES

A. Submit samples to illustrate functional and aesthetic characteristics of Product.

B. Submit samples of finishes from full range of manufacturers' standard colors, textures, and patterns for Public Works Project Manager's & Architect / Engineer’s selection.

1.18 MANUFACTURERS' INSTRUCTIONS

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

1.19 MANUFACTURERS' CERTIFICATES

A. When specified in individual Specification sections, submit manufacturers' certificate to Public Works Project Manager for review, in quantities specified for Product Data.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

1.20 QUALITY ASSURANCE / QUALITY CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply fully with manufacturers' instructions.

C. Comply with specified standards as minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

1.21 REFERENCES

A. Conform to reference standard by date of issue current as of date for receiving bids.

B. Should specified reference standard conflict with Construction Documents, request clarification from Public Works Project Manager before proceeding.

1.22 INTERIOR ENCLOSURES

A. Provide temporary partitions as required to separate work areas from Owner occupied areas, to prevent distribution of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.

1.23 PROTECTION OF INSTALLED WORK

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

1.24 PARKING

A. Arrange for temporary parking areas to accommodate construction personnel. Parking shall not be available at the Work site.

B. All contractors and their employees shall cooperate with General Contractor and others in parking of vehicles to avoid interference with normal operations and construction activities.

C. Do not obstruct existing service drives and parking lots with equipment, materials and / or vehicles. Keep accessible for Owner’s use at all times.

1.25 STAGING AREAS

A. Coordinate staging areas with Public Works Project Manager prior to starting the Work.

B. On-site space for use as staging areas and storage of materials is limited and will be apportioned among various Contractors as their needs dictate with due regard for storage requirements of each Contractor. Each Contractor shall be responsible for safety of equipment and materials that are stored on site.

1.26 OCCUPANCY DURING CONSTRUCTION AND CONDUCT OF WORK

A. Areas of existing facility will be occupied during period when the Work is in progress. Work may be done during normal business hours (8:00 am to 4:30 pm), but confer with Owner, schedule work and store materials so as to interfere as little as possible with normal use of premises. Work performed on Saturday shall be by permission of Owner. Notify Owner when coring or similar noise making work is to be done and obtain Owner's written approval of schedule. If schedule is not convenient for Owner, reschedule and resubmit new times for Owner approval. Coring of floor along with other noisy work may have to be done on second and third shifts.

B. Work shall be done and temporary facilities furnished so as not to interfere with access to any occupied area and so as to cause least possible interference with normal operation of facility or any essential service thereof.

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

D. Contractor shall provide adequate protection for all parts of facility, its contents and occupants wherever the Work under this Contract is to be performed.

E. Each Contractor shall arrange with Owner to make necessary alterations, do new work, make connections to all utilities, etc., and at such times as will not cause interruption of utility services to facility. Contractor doing this work shall protect, cap, cut off and / or replace and relocate existing pipes, electrical work and other active utilities encountered which may interfere with new construction work.

F. New work in extension of existing work shall correspond in all respects with that to which it connects or similar existing work unless otherwise indicated or specified.
   1. Existing work shall be cut, altered, removed or replaced as necessary for performance of Contract obligations.
   2. Work remaining in place, damaged or defaced by reason of work done under this Contract shall be restored equal to its condition at time of Award of Contract.
   3. If removal of work exposes discolored or unfinished surfaces or work out of alignment, such surfaces shall be refinished or materials replaced as necessary to make continuous work uniform and harmonious.

G. Contractor is responsible for providing & maintaining temporary toilet facilities.

H. Contractor & subcontractors shall follow all current *Public Health - Madison & Dane County* procedures & recommendations (see publichealthmdc.com/documents/office_space_checklist.pdf and publichealthmdc.com/coronavirus/forward-dane/current-order). Dane County reserves right to mandate safe physical distancing & use of facemasks by all personnel while inside any County facility or on any County grounds.

1.27 PROTECTION

A. Contractor shall protect from damage / injury all trees, shrubs, hedges, plantings, grass, mechanical, electrical & plumbing equipment, walks and driveways and pay for any damage to same resulting from insufficient or improper protection.

B. Contractor shall provide and maintain barricades & signage to prohibit public access to construction site.

C. Contractor shall provide and maintain guard lights at all barricades, railings, obstructions in streets, roads or sidewalks and at all trenches adjacent to public walks or roads.

1.28 PROGRESS CLEANING

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

1.29 PRODUCTS

A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work, but does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components specifically identified for reuse.

B. Do not use materials and equipment removed from existing premises, except as specifically identified or allowed by Construction Documents.

1.30 TRANSPORTATION, HANDLING, STORAGE AND PROTECTION

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

1.31 PRODUCT OPTIONS

A. Where definite material is specified, it is not intentional to discriminate against "equal" product made by another manufacturer. Intention is to set definite standard of material quality. Should bidder choose to bid materials other than those specified, bidder shall submit said materials specifications to Public Works Project Manager for approval at least seven (7) business days prior to Bid Due Date.

B. Products and materials that are not specified, but have been approved for use by Public Works Project Manager shall be identified in addenda to all bidding contractors.

C. Requests for material or product substitutions submitted after Bid Due Date may be considered. Owner reserves right to approve or reject substitutions based on Specification requirements and intended use.

1.32 SUBSTITUTIONS

A. Public Works Project Manager shall consider requests for Substitutions only within fifteen (15) calendar days after date of Public Works Construction Contract.

B. Document each request with complete data substantiating compliance of proposed Substitution with Construction Documents.

C. Limit each request to one (1) proposed Substitution for Public Works Project Manager's consideration.

D. Substitutions shall not change contract price established at Bid Due Date.

1.33 STARTING SYSTEMS

A. Provide written notification prior to start-up of each equipment item or system.

B. Ensure that each piece of equipment or system is ready for operation.

C. Execute start-up under supervision of responsible persons in accordance with manufacturers' instructions.

D. Submit written report that equipment or system has been properly installed and is functioning correctly.

1.34 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of Products to Owner's personnel prior to date of final inspection.

B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at designated location.

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

1.35 CONTRACT CLOSEOUT PROCEDURES

A. Submit written certification that Construction Documents have been reviewed, the Work has been inspected, and the Work is complete in accordance with Construction Documents and ready for Public Works Project Manager's inspection.

B. Submit final Application for Payment identifying total adjusted Contract Sum / Price, previous payments, and amount remaining due.

1.36 FINAL CLEANING

A. Execute final cleaning prior to final inspection.

B. Clean interior and exterior surfaces exposed to view.

C. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.37 ADJUSTING

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

1.38 OPERATION AND MAINTENANCE MANUAL

A. Provide two (2) bound, hard-copy operation and maintenance manuals that include all systems, materials, products, equipment, mechanical and electrical equipment and systems supplied and installed in the Work. Provide electronic version of operation and maintenance manual also.

1.39 SPARE PARTS AND MAINTENANCE MATERIALS

A. Provide Products, spare parts, maintenance and extra materials in quantities specified in individual Specification Sections.

B. Deliver to the Work site and place in location as directed.

1.40 AS-BUILT AND RECORD DRAWINGS AND SPECIFICATIONS

A. Contractor-produced Drawings and Specifications shall remain property of Contractor whether Project for which they are made is executed or not. Contractor shall furnish Public Works Project Manager with original marked up redlines of Construction Documents' drawings and specifications that shall include all Addendums, Change Orders, Construction Bulletins, Field Directives, on-site changes, field corrections, etc.

B. Architect / Engineer shall update original Construction Documents to include all Addendums & any other changes including those provided by Contractor in As-Built Drawings & Specifications. These updates are project Record Drawings & Specifications.

C. Architect / Engineer shall furnish Public Works Project Manager with Record Drawings as detailed in Professional Services Agreement.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 012200

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 Section Includes

A. Measurement and payment criteria applicable to the Work performed under a unit price payment method.

B. Defect assessment and non-payment for rejected work.

1.02 Authority

A. Measurement methods delineated within the individual specification sections or within the Bid Form are intended to compliment the criteria of this section. In the event of conflict, the requirements of the individual specification section or Bid Form shall govern.

B. The Engineer will verify all quantities.

1.03 Unit Quantities

A. If the actual work requires greater or fewer quantities than indicated within the Bid Form, provide the actual quantities at the contract unit prices through a Change Order approved by Owner.

1.04 Measurement of Quantities

A. Measurement by volume: Measured by cubic dimension using length, width, and height or thickness.

B. Measurement by area: Measured by square dimension using length and width.

C. Measurement by length: Measured by linear dimension along the centerline.

D. Measurement by weight: Measured by weight with a scale.

E. Measurement by unit: Measured by completed item.

1.05 Measurement and Payment

A. Bid Item No.1 - Performance and Payment Bonds:
   1. Performance and payment bonds include the cost to provide performance and payment bonds as required by the Contract Documents.
   2. Payment will be made at the contract lump sum price in two equal installments. The first payment will be made with the first regular payment application and the second payment will be made at 50 percent completion.

B. Bid Item No.2 - Mobilization/Demobilization:
   1. Mobilization/Demobilization will be measured as a completed unit.
   2. Payment will be made at the contract lump sum price and shall include the collection and movement of personnel, equipment, and temporary construction facilities to the project site; and their subsequent removal.

3. Payment will be made in three installments, 50% on the first payment application, 25% on the second payment application, and 25% on the final payment application.

C. Bid Item No.3 - Retaining Wall:
   1. Retaining wall will be measured by square foot.
   2. Payment will be made at the contract unit price per linear foot and shall include all labor, materials, and equipment necessary to install boulder retaining wall including design, excavation, base material, stone units, fill material (crushed aggregate and native soil), drain tile, geotextile, soil reinforcement, backfilling and compaction, and disposition of excess soil material as needed.

D. Bid Item No. 4 – Pavement Saw Cut:
   1. Saw Cut Existing AC Pavement will be measured by length.
   2. Payment will be made at the contract unit price per foot and shall include all labor and equipment necessary to saw cut the existing pavement to a neat vertical line.

E. Bid Item No. 5 – ¾” Crushed Aggregate Base:
   1. Crushed aggregate base course will be measured by ton.
   2. Payment will be made at the contract unit price per ton and shall include all labor, materials, and equipment necessary to furnish and place 3/4” stone size gravel material including crushed aggregate, placement, compaction (including water if necessary), proof rolling, and finish grading.
   3. This item covers material under the paved road, paved parking lots, gravel road, and gravel shoulder.

F. Bid Item No. 6 - 3” HMA Paving:
   1. 3” HMA Paving, HMA 4LT 58-28S will be measured by ton.
   2. Payment will be made at the contract unit price per ton and shall include all labor, materials, and equipment necessary to furnish, perform, and install the following:
      i. Finish grading of the crushed aggregate base course to the final grade, elevation and cross section including grading, compaction, water if necessary, and proof rolling.
      ii. AC HMA 4LT 58-28S 1,5” pavement binder course installation including asphaltic material, placement, compaction, and testing.
      iii. AC HMA 4LT 58-28S 1,5” pavement surface course installation including asphaltic material, placement, compaction, and testing.
      iv. AC HMA 4LT 58-28s 2” pavement binder course installation at the intersection with the County Road including asphaltic material, placement, compaction, and testing.
      v. AC HMA 4LT 58-28s 2” pavement surface course installation at the intersection with the County Road including asphaltic material, placement, compaction, and testing.
      vi. Parking lot pavement markings.

G. Bid Item No. 7 – Shelter Concrete Slab and Footings:
   1. Shelter Concrete Slab and Footings will be measured by completed unit.
   2. Payment will be made at the contract lump sum price and shall include all labor, materials, and equipment necessary to construct shelter footings and concrete slab including removing and disposing or reusing of remaining gravel pavement, stripping and stockpiling topsoil, clearing, grubbing, undercutting and disposal of plant material, cutting and filling to the required subgrade contours and sections, required depth of crushed aggregate base, compacting, compaction testing, proof rolling, excavation for footings, placement of forms, steel and concrete needed for create footings and slab for the park shelter,
   3. Shelter Patio concrete area and creation of 48” fire pit opening are included within this Bid Item.

H. Bid Item No. 8 - Excavation
   1. Unclassified Excavation will be measured by volume.
   2. Payment will be made at the contract unit price per cubic yard and shall include all labor, materials, and equipment necessary to complete the specified excavation including removing and disposing or reusing of remaining gravel pavement, stripping and stockpiling topsoil, clearing, grubbing, undercutting and disposal of plant material, cutting and filling to the required subgrade contours and sections, compacting, compaction testing, proof rolling, and excess soil material disposal.
   3. The Owner reserves the right to adjust the estimated depth of undercutting in this Bid Item based on soil conditions at the sites.
   4. Removing existing asphalt pavement, concrete pavement, curb and gutter, sidewalk, saw cutting, stripping and stockpiling topsoil, clearing and grubbing, and finish grading of street subgrade are incidental to the excavation unless separate bid items are included on the Bid Form.
   5. This Bid Item covers material under the gravel road, gravel shoulder, intersection widening, access driveway culvert cleaning/excavation, and paved parking lots.
   6. This Bid Item includes installation of 9 feet long culvert extension with end section that will be connected to existing culvert under the driveway at the County Road intersection.

I. Bid Item No. 9 - Concrete Sidewalk,
   1. Concrete Sidewalk will be measured by area.
   2. Payment will be made at the contract unit price and shall include all labor, materials, and equipment necessary to install concrete driveway/sidewalk including excavation and disposal of excess native material, required depth of crushed aggregate base, forming, concrete, expansion joints, curb ramps, detectible warning surface, finishing, curing, and testing.

J. Bid Item No. 10 - Water Line:
   1. Water Line will be measured by length along the centerline of the pipe from the centerline of the connection to the pump to the connection at the fountain.
   2. Payment will be made at the contract unit price per foot and shall include all labor, materials, and equipment necessary to furnish and install water line including excavation, bedding and cover, pipe, connection to the proposed supply and discharge, backfilling and compaction, compaction testing, disposition of excess material, testing and marking of pipe end, creating a capped line for water fountain connection, and as-built drawings. Water fountain to be provided and installed by Owner.

K. Bid Item No. 11 - 4”-Inch HDPE Storm Sewer
   1. 4”-Inch HDPE Storm Sewer will be measured by length along the centerline of the pipe from inside edge of structure to inside edge of structure.
   2. Payment will be made at the contract unit price per foot and shall include all labor and equipment necessary to furnish and install storm sewer including excavation, bedding and cover, pipe, all needed fittings, capped connection to the water fountain drain, backfilling and compaction, compaction testing, disposition of excess material, and as-built drawings.

L. Bid Item No. 12 - 8”-Inch HDPE Storm Sewer
   1. 8”-Inch HDPE Storm Sewer will be measured by length along the centerline of the pipe from inside edge of structure to inside edge of structure.
   2. Payment will be made at the contract unit price per foot and shall include all labor and equipment necessary to furnish and install storm sewer including excavation, bedding and cover, pipe, all needed fittings, riprap, needed pipe end section, backfilling and compaction, compaction testing, disposition of excess material, and as-built drawings.

M. Bid Item No. 13 - 12”-Inch HDPE Storm Sewer
   1. 12”-Inch HDPE Storm Sewer will be measured by length along the centerline of the pipe from inside edge of structure to inside edge of structure.

2. Payment will be made at the contract unit price per foot and shall include all labor and equipment necessary to furnish and install storm sewer including excavation, bedding and cover, pipe, all needed fittings, riprap, needed pipe end section, backfilling and compaction, compaction testing, disposition of excess material, and as-built drawings.

N. Bid Item No. 14 - 24-Inch ADS Manhole:
1. 24-Inch ADS Manhole will be measured as a completed unit.
2. Payment will be made at the contract price per manhole unit and shall include all labor, materials, and equipment necessary to furnish and install storm inlet manhole including excavation, stone base material, manhole sections, steps, benches and flowline, grate backfilling and compaction, disposition of excess material, and as-built drawings.

O. Bid Item No. 15 - 36-Inch ADS Manhole:
1. 36-Inch I.D. ADS Manhole will be measured as a completed unit.
2. Payment will be made at the contract price per manhole unit and shall include all labor, materials, and equipment necessary to furnish and install storm inlet manhole within the biofilters including excavation, stone base material, manhole sections, steps, benches and flowline, grate, backfilling and compaction, disposition of excess material, and as-built drawings.

P. Bid Item No. 16 and 17 - Biofilter Basin 1/Biofilter Basin 2
1. Biofilter Basin 1/Biofilter Basin 2 will be measured as a completed unit.
2. Payment will be made at the contract lump sum price and shall include all labor, materials, and equipment necessary to complete the specified biofilter basins including stripping and stockpiling topsoil, clearing, grubbing and disposal of plant material, cutting and filling to the required subgrade contours and sections, compacting, disposition of excess soil material, geotextile, gravel and pea gravel underdrain, engineered soil, pipe underdrain with sock, connection to the outlet structure, overflow weir. TRM, matting, and placing planting to be provided and installed under separate contract.

Q. Bid Item No. 18 - Erosion Control:
1. Silt Fence will be measured as a completed unit.
2. Payment will be made by the contract lump sum price and shall include all labor, materials, and equipment necessary to install, maintain, and remove erosion control practices such as silt fence, sediment log, and inlet protection. Payment will be made in three installments; 50 percent when installed, 25 percent when the work is 75 percent complete, and 25 percent when disturbed areas are stabilized and the facilities are removed.

R. Bid Item No. 19 - Restoration (Topsoil, Fertilize, Seed):
1. Restoration (Topsoil, Fertilize, Seed) will be measured by the area restored.
2. Payment will be made at the contract unit price and shall include all labor, materials, and equipment necessary to place and finish grade reclaimed topsoil to a compacted thickness of 4 inches, prepare the seed bed, fertilize, seed, mulch, and watering, if necessary.
3. Contractor is responsible for providing an acceptable stand of grass within the establishment period. Watering may or may not be needed; it is the Contractor's option.

S. Bid Item No. 20 - Traffic Control:
1. Traffic Control will be measured as a completed unit.
2. Payment will be made by the contract lump sum price and shall include all labor, materials, and equipment necessary to install, maintain, and remove traffic control facilities in accordance with the traffic control plan.

T. Bid Item No. 21 – Well and Enclosure:
1. Well and Enclosure will be measured as a completed unit.
2. Payment will be made at the contract lump sum price and shall include all labor, materials, and equipment necessary to install a new well, well controller, and pressure tank including

casing and liner pipe, well accessories, grouting, pumps and controls, pressure tank, plumbing, concrete pad, enclosure, needed plumbing, testing, and permitting.

U. Bid Item No. 22 – Electrical Work:
   1. Electrical Work will be measured as a completed unit.
   2. Payment will be made at the contract lump sum price and shall include all labor, materials, and equipment necessary to provide electrical power to the well, shelter, toilet, and charging station, as indicated in these specifications and the associated drawings.

V. Bid Item No. 23 – Charging Station:
   1. Charging Station will be measured as a completed unit.
   2. Payment will be made at the contract lump sum price and shall include all labor, materials, and equipment necessary to install a new charging station including charging station, protective bollards, and all specified components and accessories necessary for a complete and functional installation as indicated in theses specifications and the associated drawings.

W. Bid Item No. 24 – Park Shelter:
   1. Park Shelter will be measured as a completed unit.
   2. Payment will be made at the contract lump sum price and shall include all labor, materials, and equipment necessary to construct a new park shelter timber building, including, wood materials, metal hardware, wood posts, stone veneer, roof structure, roof covering, and downspout system including connection to the storm sewer. The park shelter shall be constructed as outlined within the plans and specifications.

X. Bid Item No. 25 – Electric Utility Service Allowance:
   1. Electric Utility Service Allowance will be measured as an invoiced price from Alliant Energy.
   2. Payment will be made for the work performed by Alliant Energy to provide new underground primary conductors, pad mounted transformer, and secondary conductors to meter socket, in accordance with the latest edition of Alliant Energy's standard Service Rules. This work shall be paid at the invoice price from Aliant Energy without Contractor's markup.
   3. The General Contractor/Electrical Contractor shall coordinate service work and exact layout with Engineer/Owner and Alliant Energy.

1.06 Defect Assessment

A. Replace the work, or portions of the Work, not conforming to the specified requirements.

B. If, in the opinion of the Engineer, it is not practical to remove and replace the Work, the Engineer will direct one of the following remedies.
   1. The defective Work may remain, but the unit sum/price will be adjusted to a new sum/price, at the discretion of the Engineer.
   2. The defective Work will be partially repaired to the instruction of the Engineer, and the unit sum/price adjusted to a new sum/price, at the discretion of the Engineer.

C. The individual specification sections may modify these remedies.

D. The authority of the Engineer to assess the defect and identify payment adjustments, is final.

1.07 Non-Payment for Rejected Products

A. Product: Any natural, processed, manufactured, or fabricated material incorporated into the Work.

B. Payment will not be made for any of the following:
   1. Products wasted.
   2. Products determined to be unacceptable before or after placement.
   3. Products not completely unloaded from the transporting vehicle.

4. Products placed beyond the lines and levels required for the Work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling, and disposing of rejected products.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

1.01 Section Includes

A. Submittal procedures.

B. Construction progress schedules.

C. Shop drawings.

D. Product data.

E. Samples.

F. Manufacturer's installation instructions.

G. Manufacturer's certificates.

1.02 Submittal Procedure

A. Transmit each submittal with Engineer accepted form. Email submittals are acceptable.

B. Identify revisions or resubmittals.

C. Identify project, Contractor, subcontractor, or supplier; pertinent drawing and detail number, and specification section, as appropriate.

D. Apply Contractor's stamp, signed or initialed certifying that review, verification of products required, field dimensions, adjacent construction, and coordination of information, is in accordance with the requirements of the Work and the Contract Documents. **Submittal will be returned if the Contractor's stamp is not on the submittal.**

E. Schedule submittals to expedite the Work. Coordinate submission of related items.

F. For each submittal review, allow 7 days excluding delivery time from and to the Contractor.

G. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of the Work.

H. Provide space for Contractor and Engineer review stamps.

I. Revise and resubmit, identify all changes made since previous submission.

J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with provisions.

1.03 Quality Assurance

A. The Engineer will review submittals only for general conformance with the design concept. Such review shall not relieve the Contractor or any subcontractor of responsibility for full compliance with the Contract Documents; for correctness of dimensions, clearances, and material quantities; for proper fabrication and construction techniques; for proper coordination with other trades; and for providing all devices required for safe and satisfactory construction and operation.

B. Submittals reviewed by the Engineer and returned to the Contractor will be marked with one of the following designations:

1. Reviewed.
2. Review with Comments.
3. Revise and Resubmit.

4. Rejected.
5. See Letter for Additional Comments.

1.04 Construction Progress Schedule

A. Submit initial schedule in duplicate within 15 days after the date of Owner-Contractor Agreement, but not later than preconstruction conference.

B. Revise and resubmit as required.

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

D. Submit a computer generated or horizontal bar chart with separate line for each major section of work or operation, identifying first day of each week.

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

1.05 Shop Drawings

A. Shop Drawings include specially prepared technical data for the Work, including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form.

B. Submit number of opaque reproductions required by the Contractor plus three copies which will be retained by the Engineer.

C. Drawings shall be to scale and of adequate size to clearly show all pertinent aspects of the item.

1.06 Product Data

A. Product Data includes standard printed information on materials, products, and systems not specially prepared for the Work, other than designation of selections from among available choices printed thereon.

B. Submit number of opaque reproductions required by the Contractor plus three copies which will be retained by the Engineer.

C. Mark each copy to identify applicable products, models, options, and other data. Modify drawings and diagrams to delete information that is not applicable to the Work. Supplement manufacturer's standard data to provide information unique to the Work.

1.07 Samples

A. Samples include both fabricated and non-fabricated physical examples of materials, products and units of work; both as complete units and as smaller portions of units of work; either for limited visual inspection or for testing and analysis.

B. Submit one sample unless individual specification sections require additional samples.

C. Submit samples to illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate samples for interfacing work.

D. Submit samples of finishes from full range of manufacturer's standard colors, textures, and patterns for Owner selection.

E. Include identification on each sample, with full Project information.

1.08 Manufacturer Installation Instructions

A. When specified in individual sections, submit printed instructions for delivery, storage, assembly, installation, adjusting, and finishing to Engineer, in quantities specified for Product Data.

B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.09 Manufacturer Certificates

A. When specified in individual sections, submit certification by manufacturer to Engineer, in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certificates as appropriate.

C. Certificates may be recent or previous test results on material or product, but must be acceptable to Owner.

END OF SECTION

SECTION 01 35 29

ENVIRONMENTAL POLLUTION, SAFETY, AND ACCESS

PART 1 - GENERAL

1.01 Section Includes

A. Requirements for preventing and/or reducing environmental pollution.

B. Safety during construction operations.

C. Public and private access to construction site.

1.02 Environmental Pollution

A. General: Maintain all work areas on and off the site free from environmental pollution that would be in violation of any Federal, State or local regulation.

B. Protection of Sewers: Do not impair the operation of existing sanitary sewers. Prevent construction material, pavement, concrete, soil or other debris from entering a sewer or sewer structure. When it is necessary to divert wastewater flow to accomplish the construction work, divert the flow to sewers draining to the treatment facilities. Under no circumstances shall wastewater be allowed to flow onto the ground or into surface waters.

C. Erosion Control: Sediment from the project site shall not be allowed to be deposited off the site or into surface waters on or off the site. Provide erosion control facilities and measures to prevent erosion.

D. Air Quality: Minimize air pollution during construction. Wet bare soils during dry weather to minimize dust. Dust prevention is particularly important on unpaved streets and haul roads. Provide dust prevention treatments or watering to reduce dust. Provide and maintain combustion emission control devices on construction equipment and shut down motorized equipment not in use. Trash burning at the construction site will not be permitted.

E. Noise Control: Conduct the construction operations to cause the least amount of noise. Provide intake silencers on compressors and exhaust silencers or mufflers on internal combustion engines. Do not operate construction vehicles and equipment between the hours of 8:00 P.M. and 7:00 A.M. without written permission from the Engineer.

F. Spills: Spills of hazardous materials shall be immediately contained and cleanup provided by qualified persons. Report the spill to the applicable authority.

1.03 Safety

A. Contractor's Responsibility: The Contractor shall be solely and completely responsible for safety as set forth in Sections 6.13, 6.14, and 6.15 of the General Conditions. This requirement shall apply continuously and not be limited to normal working hours. Neither the Owner nor the Engineer nor their representatives are responsible for safety.

B. Safety Measures and Equipment: Maintain at the job-site safety equipment and apparatus applicable to the work and as prescribed by governing codes.

Provide equipment and supplies necessary to give first aid to injured persons. Establish a procedure for immediate transporting of injured persons to local hospital or medical clinic.

Take necessary precautions to protect the general public from hazards including, but not limited to, surface irregularities or unramped grade changes in pedestrian walkways, trenches and excavations. Provide barricades, lights and signs as necessary to ensure safety to the public.

Performance of the work with respect to ladders, platforms, structure openings, temporary railings, scaffolding, shoring, lagging and machinery guards shall be in conformance with applicable

governing codes.

Maintain temporary fencing, railings, barricades or steel plates as applicable at all openings, trenches or excavations. Provide lights or reflectors as necessary or required by governing codes.

C. Accident Reports: Immediately report all serious injuries and property damage to the Engineer. Promptly provide a written report of the incident to the Engineer giving full details of the accident including a description of the injury or damage, persons injured or involved and statements of witnesses.

If a claim is made by anyone against the Contractor or any subcontractor resulting from an accident, promptly report the facts in writing to the Engineer giving full details of the claim including investigation and restitution.

D. Traffic Safety: Comply with all laws regarding closing or restricting the use of public streets and comply with any specific requirements indicated in other Sections or in highway permits specific to the work. Provide traffic control devices in accordance with the Manual of Uniform Traffic Control Devices. Provide properly equipped flaggers as necessary or when required by the contract documents.

E. Fire Prevention: Execute the work in a manner that minimizes the potential for a fire. Provide fire extinguishers in construction vehicles and equipment. Provide personnel with information on reporting a fire.

F. Use of Explosives: The use of explosives shall be in accordance with Wisconsin Administrative Code COM 7. Contractor is responsible for obtaining any required permits. For work outside of Wisconsin, comply with the applicable codes of the state in which the work is located.

1.04 Site Access

A. Access to Property: No public or private road shall be closed except by the express permission of the Engineer or Owner. Conduct the work to ensure the least possible obstruction to traffic and normal commercial pursuits. Construct and maintain such facilities as may be required to provide access to properties. Pedestrian access to properties shall be provided at all times. Vehicle access to properties shall be maintained during all non-working hours.

B. Where traffic will pass over backfilled areas prior to paving, the roadway shall be maintained in a manner that will allow normal vehicular traffic. Temporary driveway access shall be provided.

C. Emergency and Public Vehicle Access: Notify the local fire and police departments and public and school transportation companies at least 24 hours prior to closing any street or portion thereof. No street closing shall be made without the concurrence of the fire and police departments. Notify the fire and police when the streets are passable for emergency vehicles. Maintain vehicle access to consecutive arterial crossings or dead end streets in excess of 300 feet unless written permission is obtained from the fire and police departments.

Provide non-working hours telephone number(s) to the fire and police departments to allow contact for emergencies.

Maintain postal service to properties affected by the construction.

END OF SECTION

SECTION 01 45 16

TESTING REQUIREMENTS

PART 1 - GENERAL

1.01 General

A. Contractor shall employ and pay for the services of an independent testing firm to perform the specified testing.

B. Testing is required for the following:
   1. Cast-in-Place Concrete (Test cylinders, air content, temperature, and slump):
      a. Section 03 31 00 - Concrete, Forms, and Reinforcement.
      b. Section 00 30 01 - Sitework Concrete
   2. Soils Compaction:
      a. Section 31 22 00 - Site Preparation and Earthwork.
      b. Section 31 23 00 - Structural Excavation, Backfill, and Compaction
      c. Section 31 23 33 - Utility Excavation, Backfill, and Compaction.
   3. Aggregate Gradation:
      a. Section 32 11 23 - Crushed Aggregate Base Course.
   4. Asphaltic Concrete Compaction:
      a. Section 32 12 16 - Asphaltic Concrete Pavement.
   5. Watermain Construction:
      b. Section 33 11 13 - Water Main Construction.

1.02 Testing Firm Qualifications

A. Firm shall be qualified and certified for the types of testing to be performed.

B. Meet basic requirements of ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspections.

C. Authorized to operate in the State of Wisconsin.

D. Bacteriological test firm to be approved by the Wisconsin DNR.

1.03 Testing Firm Duties

A. Provide qualified personnel.

B. Perform specified inspections, sampling, and testing:
   1. Comply with specified standard.
   2. Ascertain compliance with requirements of Contract Documents.

C. Promptly notify Engineer and contractor of observed irregularities or deficiencies.

D. Promptly submit written reports to Contractor. Each report shall include:
   1. Date issued.
   2. Project title and number.
   3. Testing firm name, address and telephone number.
   4. Date and time of sampling.
   5. Record of weather conditions.
   6. Date of test.
   7. Identification of specification section.
   8. Location of sample or test.
   9. Type of test.
   10. Results of tests and compliance with Contract Documents.

1.04 Limitations of Authority

A. Testing firm is not authorized to:
   1. Release, revoke, alter, or enlarge on requirements of the Contract Documents.
   2. Approve or accept any portion of the Work.

3. Perform any duties of the Contractor.

1.05 Contractor's Responsibilities

A. Cooperate with testing firm personnel and provide access to the site.

B. Secure and deliver to the testing firm adequate quantities of representative samples of materials proposed to be used and which require testing.

C. Furnish incidental labor and facilities:
   1. To provide access to Work being tested.
   2. To obtain and handle samples at the project site.
   3. To facilitate inspections and tests.
   4. For storage, transporting, and curing of samples.

D. Furnish copies of test reports.

E. Notify testing firm sufficiently in advance of operations to allow testing firm to assign personnel and schedule tests.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT, DISPOSAL & RECYCLING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Summary
2. Waste Management Goals
3. Construction and / or Demolition Waste Management
4. Waste Management Plan
5. Reuse
6. Recycling
7. Materials Sorting and Storage On Site
8. Lists of Recycling Facilities Processors and Haulers
9. Waste Management Plan Form

B. Related Sections:
1. Section 01 00 00 - General Requirements

1.2 WASTE MANAGEMENT GOALS

A. Dane County requires that as many waste materials as possible produced as result of this project be salvaged, reused or recycled in order to minimize impact of construction waste on landfills and to minimize expenditure of energy and cost in fabricating new materials. Additional information may be found in Dane County Green Building Policy, Resolution 299, 1999-2000.

1.3 CONSTRUCTION AND / OR DEMOLITION WASTE MANAGEMENT

A. All construction and demolition waste suitable for recycling may go to Dane County Construction & Demolition Recycling Facility located at 7102 US Hwy 12, Madison, located across from Yahara Hills Golf Course. This facility can receive mixed loads of construction and demolition waste. For complete list of acceptable materials, see landfill.countyofdane.com/services/construction.

B. Dane County Landfill, also at 7102 US Hwy 12, Madison, must receive all other waste from this project. landfill.countyofdane.com/services/landfill.

1.4 WASTE MANAGEMENT PLAN

A. Contractor shall develop Waste Management Plan (WMP) for this project. Contact the Dane County Special Projects & Materials Manager with questions. Outlined in RECYCLING section of this specification are examples of materials that can be recycled or reused as well as recommendations for waste sorting methods.

B. Contractor shall complete WMP and include cost of recycling / reuse in Bid. Submit WMP to Public Works Project Manager within fifteen (15) business days of Bid Due date, with Bid. Copy of blank WMP form is in this Section. Submittal shall include cover letter and WMP form with:

1. Information on:
    a. Types of waste materials produced as result of work performed on site;
    b. Estimated quantities of waste produced;
    c. Identification of materials with potential to be recycled or reused;
    d. How materials will be recycled or reused;
    e. On-site storage and separation requirements (on site containers);
    f. Transportation methods; and
    g. Destinations.

1.5 REUSE

A. Contractors and subcontractors are encouraged to reuse as many waste materials as possible. Investigate salvage for materials not reusable on site.

1.6 RECYCLING

A. These materials may be recycled at Dane County Construction & Demolition Recycling Facility:
    1. Wood.
    2. Wood Pallets.
    3. PVC Plastic (pipe, siding, etc.).
    4. Asphalt & Concrete.
    5. Bricks & Masonry.
    6. Vinyl Siding.
    7. Cardboard.
    8. Metal.
    9. Unpainted Gypsum Drywall.
    10. Shingles.

B. These materials can be recycled elsewhere in Dane County area:
    1. Fluorescent Lamps.
    2. Foam Insulation & Packaging (extruded and expanded).
    3. Carpet Padding.
    4. Barrels & Drums.

C. All materials must be recycled at WDNR permitted waste processing facilities that adhere to all State Statutes.

1.7 MATERIALS SORTING AND STORAGE ON SITE

A. Contractor shall provide separate containers for recyclable materials. Number of containers will be dependent upon project and site conditions.

B. Contractor shall provide on-site locations for subcontractors supplied recycling containers to help facilitate recycling.

C. Dane County allows mixed loads of recycled materials only per instructions at landfill.countyofdane.com/services/construction.

1.8 LISTS OF RECYCLING FACILITIES PROCESSORS AND HAULERS

A. Refer to landfill.countyofdane.com/services/construction for information on Dane County Construction & Demolition Recycling Facility.

B. Web site landfill.countyofdane.com/recycle-locations lists current information for Dane County Recycling Markets. Contractors can also contact Allison Rathsack, 608/266-4990, or local city, village, town recycling staff listed at site landfill.countyofdane.com/resources/local-contacts. Statewide listings of recycling / reuse markets are available from UW Extension at uwgb.edu/solid-hazardous-waste-education-center/.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

WASTE MANAGEMENT PLAN FORM

Contractor Name: _____

Address: _____

_____

Phone No.: _____ Recycling Coordinator: _____

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

WASTE MANAGEMENT PLAN FORM

Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____

SECTION 03 31 00

CONCRETE, FORMS AND REINFORCEMENT

PART 1 - GENERAL

1.01 Section Includes

A. Formwork for cast-in-place concrete.

B. Steel reinforcing for cast-in-place concrete.

C. Cast-in-place concrete.

D. Curing and Sealing.

1.02 Related Sections

A. Section 07 92 00 - Joint Sealers.

B. Section 01 45 16 – Testing Requirements.

1.03 References

A. ACI 117-90 - Standard Tolerance for Concrete Construction Materials.

B. ACI 301-96 - Structural Concrete for Buildings.

C. ACI 305R-91 - Hot Weather Concreting.

D. ACI 306R-88 - Cold Weather Concreting.

E. ACI 308-92 - Standard Practice for Curing Concrete.

F. ACI 318-08 - Building Code Requirements for Reinforced Concrete.

G. ACI 347-94 - Guide to Formwork for Concrete.

H. ASTM A82 - Steel Wire, Plain, for Concrete Reinforcement.

I. ASTM A185 - Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.

J. ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

K. ASTM C31 - Making and Curing Concrete Test Specimens in the Field.

L. ASTM C33 - Standard Specification for Concrete Aggregates.

M. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

N. ASTM C94 - Standard Specification for Ready-Mixed Concrete.

O. ASTM C143 - Standard Test Method for Slump of Hydraulic Cement Concrete.

P. ASTM C150 - Standard Specifications for Portland Cement.

Q. ASTM C171 - Sheet Materials for Curing Concrete.

R. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.

S. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete.

T. ASTM C260 - Air Entraining Admixtures for Concrete.

U. ASTM C494 - Chemical Admixtures for Concrete.

V. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

W. ASTM C618 - Coal Fly Ash and Raw or Calcinated Natural Pozzolan for Use in Concrete.

X. ASTM D1751 - Performed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

Y. ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

1.04 Quality Assurance

A. Perform formwork in accordance with ACI 347.

B. Perform reinforcement work in accordance with ACI 318.

C. Perform concrete work in accordance with ACI 301.

D. Conform to ACI 305R when concreting in hot weather and ACI 306R when concreting in cold weather.

1.05 Submittals

A. Formwork: Submit manufacturer's data and installation instructions for proprietary materials including form coating, ties and accessories, and manufactured form systems.

B. Reinforcement: Provide shop drawings prepared indicating bar sizes, spacing, locations, and quantities of reinforcing steel, bending and cutting schedules, and supporting and spacing devices.

C. Concrete
   1. Mix Design
      a. Provide dry weight of cement, saturated-surface dry weight of aggregate, brand name, type, and quantity of admixtures, and pounds of water per cubic yard of concrete.
      b. Test data supporting the portions of the design mixes based on laboratory trial batches in accordance with ACI 318. Test data supporting the proportions of the design mixes based on past field experience in accordance with ACI 318 may be provided in lieu of the laboratory data.
      c. Design mixes shall be approved by Engineer a minimum of five working days prior to delivery of concrete to the Site.
   2. Admixtures: Submit manufacturer's literature and certifications.
   3. Delivery Tickets: With each load of concrete delivered, duplicate delivery tickets shall be provided which give the following information:
      a. Name of ready-mix batch plant.
      b. Serial number of ticket
      c. Date.
      d. Truck number.
      e. Name of contractor.
      f. Name and location of job.
      g. Class or designation of concrete.
      h. Amount of concrete in cubic yards.
      i. Time loaded or of first mixing of cement and aggregate.
      j. Water added at jobsite and initials of person authorizing addition.
      k. Admixtures, if added.
   4. Surface Treatments: Submit manufacturer's literature and application recommendations.

1.06 Delivery

A. Deliver reinforcement in bundles with metal tags indicating bar size and length.

1.07 Coordination

A. Coordinate placement of formwork, formed openings, and placement of accessories and

attachments.

PART 2 - PRODUCTS

2.01 Forms

A. Wood Forms
   1. Plywood: PS1, BB grade, Class 1.
   2. Clean straight lumber, dressed on face and edges, 2-inch nominal thickness.

B. Preformed Steel Forms: Minimum 16 gauge matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.

C. Pan Type: Steel of size and profile required.

D. Tubular Column Type: Round, spirally wound laminated fiber material, surface treated with release agent, non-reusable, of sizes required.

2.02 Formwork Accessories

A. Form Ties: Snap-off type, galvanized metal, adjustable length, cone type, 1-inch breakback dimension. The tie shall not leave holes larger than one inch diameter in concrete surface.

B. Form Release Agent: Colorless mineral oil which will not stain concrete, or absorb moisture, or impair natural bonding of coating intended for use on concrete.

C. Chamfered Corners: When Drawings indicate chamfered corners provide wood strip type.

D. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

E. Waterstop: Polyvinyl chloride with preformed corner sections and heat welded jointing.
   1. Non-Moving Construction Joints: 6” ribbed, 3/8” thick, non-tapered, 5/8” rib diameter; Greenstreak 679 or equal.
   2. Expansion and Moving Construction Joints: 9” ribbed with center ball, 3/8” thick, non-tapered, 5/8” rib diameter, 1” O.D. and 1/2” I.D. center bulb; Greenstreak 735 or equal.

2.03 Formwork Design

A. Design formwork to safely support vertical and lateral loads that may be applied until such loads can be supported by the concrete structure.

B. Design formwork to carry loads to ground or to concrete that has attained adequate strength.

C. Design formwork to include assumed values of live load, dead load, weight of equipment to be operated on formwork, concrete mix, height of concrete drop, vibrator frequency, ambient temperature, foundation pressures, stresses, lateral stability, and other factors pertinent to the safety of the structure during construction.

D. Support form facing materials to prevent deflection.

E. Provide camber as required for anticipated deflections due to weight and pressure of fresh concrete and construction loads.

2.04 Reinforcement

A. Reinforcing Steel: ASTM A615; Grade 60, deformed, unfinished.

B. Welded Steel Wire Fabric: ASTM A185: flat sheets, unfinished.

2.05 Reinforcement Accessories

A. Tie Wire: Minimum 16 gage annealed type.

B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions.

C. Splice Devices: Sized to develop 125 percent yield strength of bar.

2.06 Concrete Materials

A. Portland Cement: ASTM C150, Type 1.

B. Aggregate: ASTM C33.

C. Water: Clean and not detrimental to concrete.

D. Flyash: ASTM C618, Class C.

2.07 Concrete Admixtures

A. Air Entrainment: ASTM C260.

B. Water Reducing: ASTM C494; Type A, Water Reducing.

C. Retarding: ASTM C494. Type D, Water Reducing and Retarding.

D. Accelerating: ASTM C494 Type C Accelerating (non-chloride); Type E, Water Reducing and Accelerating (non-chloride).

E. Superplasticizer: A high-range water reducing admixture meeting requirements of ASTM C494, Type F; Master Builders Rheobuild 1000 or equal.

F. Crystalline Waterproofing: A waterproofing agent meeting requirements of permeability according to COE CRD-C48.

2.08 Accessories

A. Vapor Retarders: 6 mil thick clear polyethylene film, type recommended for below grade application.

B. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

2.09 Concrete Mix Design

A. Mix and deliver concrete in accordance with ASTM C94.

B. Select proportions in accordance with ACI 301.

C. Provide concrete in accordance with the following requirements:
1. Concrete Mixes

Concrete Mixes		
Class	Compressive Strength at 28 days, psi	Maximum Water-Cement Ratio, by Weight
Plain Concrete		
A	5,000	.48
B	4,000	.57
C	3,500	.62
Air-Entrained Concrete		
D	4,000	.48

2. Air Content: Total air content (entrained and entrapped) for air-entrained concrete shall be in accordance with the following table:

Air Content	
Nominal Max. Size Aggregate	Air Content
¾"	6% ± 1
1"	6% ± 1
1 ½"	5% ± 1

3. In any mix, up to 20 percent of the cement (on a pound per pound basis) may be replaced with flyash.
4. Superplasticizer: Superplasticizer may be used at the Contractor's option. See Drawings for any locations where superplastized concrete is required. Superplasticizer shall generally be added at the plant, but may be added at the jobsite.
5. Concrete Schedule: Unless otherwise indicated in the Contract Documents provide concrete in accordance with the following schedule.

Concrete Schedule	
Concrete Class	Location
Class A	Walls & floors where water tightness is required (i.e. tanks, wet wells)
Class B	Structural slabs Beams and columns Interior precast topping
Class C	Footings Exterior walls Interior walls Interior slabs-on-grade
Class D	Exterior slabs Exterior precast topping Retaining walls Curb & gutter and sidewalk Other similar exterior concrete

D. Slump:

Location	Slump, Inches	
	Slump	Tolerance
Footings	5	± 1
Beams, columns and interior walls	4	± 1
Reinforced foundation walls, exterior walls	3	± 1
Interior slab on grade	3	± 1
Exterior slab on grade	3	± 1
Precast topping	3	± 1
Metal pan stairs	3	± 1
Pavements, sidewalk, curb and gutter	3	± 1
Retaining walls	3	± 1

Superplasticized Concrete Slump: 7 inches, not to exceed 10 inches. Do not use less than the manufacturer's recommended minimum dose. Adjust "water slump" (slump before superplasticizer addition) to be in line with Section D, above, and then utilize an appropriate superplasticizer dose to meet this final slump range.

2.10 Curing Materials

A. Reinforced Paper: Two sheets of kraft paper cemented together with bituminous material reinforced with fiber meeting requirements of ASTM C171.

B. Plastic Film: Polyethylene film with a minimum thickness of 0.004 inches meeting requirements of ASTM C171.

C. Curing Compound: Liquid membrane curing compound meeting requirements of ASTM C309. For concrete floors specified to receive a combination curing, sealing, and dustproofing compound, provide Sonneborn Kure-N-Seal or equal. Compound shall be compatible with resilient flooring and

carpet adhesives.

D. Curing/Sealing Material:
   1. An acrylic resin curing, sealing, and hardening compound for exterior freshly placed concrete that provides a durable, long-lasting moisture impermeable finish that improves resistance to chemicals, grease, and de-icing salts.
   2. Meet requirements of ASTM C1315, Type 1, Class B and ASTM C309, Type 1, Classes A and B.
   3. Manufacturer: AS-1 Achro Seal 1315 OTC, TK Products; Seal Cure 309-30, W.R. Meadows; or equal.

2.11 Concrete Sealers

A. Hardener/Sealer: A water soluble sealer densifier that produces a dense surface resistant to abrasion, moisture, and tire marking and provides added gloss to the floor.

B. Manufacturer: Kure-N-Harden, Degussa Building Systems or equal.

PART 3 - EXECUTION

3.01 Form Construction

A. General
   1. Construct forms to produce concrete sections of the size, shape lines and dimensions indicated and as required to obtain accurate alignment, location, grade, level and plumbness.
   2. Provide for openings, offsets, keyways, moldings, riglets, chamfers, blocking, screeds bulkheads, anchorages, inserts and other required features.

B. Fabrication
   1. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage concrete surfaces.
   2. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only.
   3. Kerf wood inserts for forming keyways, riglets, recesses, and similar items to prevent swelling and to ensure easy removal.
   4. Provide temporary openings where interior area of formwork is inaccessible for cleanout and inspection and concrete placement. Brace temporary openings in as inconspicuous locations as possible.
   5. Butt joints tight and provide back-up materials as necessary to prevent leakage of concrete paste.

C. Falsework
   1. Support, brace and maintain falsework to safely support vertical. lateral, and asymmetrical loads until loads can be supported by in-place construction. Provide shores and struts with positive means of adjustment capable of taking up settlement during concrete placement using wedges or jacks.
   2. Carefully inspect falsework and formwork during and after concrete placement for abnormal deflections or signs of failure. Make any necessary adjustments.

D. Forms for Exposed Concrete.
   1. Drill wood forms to suit ties used and to prevent leakage around tie holes. Do not splinter forms by driving ties through improperly prepared holes.
   2. Provide sharp, clean corners at intersecting planes without visible edges or offsets. Back joints with extra studs or girts to maintain true intersections.
   3. Use extra studs, walers and bracing to prevent bowing of forms between studs. Do not use narrow strips of form material which allows bowing.

E. Corner Treatment: Unless otherwise indicated, form chamfers with 3/4 in. x 3/4 in. strips accurately formed and surfaced to produce uniformly straight lines and tight edge joints on exposed concrete. Extend terminal edges to required limit and miter chamfer strips at changes in direction.

F. Provisions for Other Trades
   1. Provide openings in formwork to accommodate other trades. Verify size and location with trade requiring the opening. Provide openings in accordance with approved shop drawings.

2. Accurately and securely support items to be built into the forms. Other trades shall provide items to be installed and shall provide instructions and supervision as necessary.

G. Installation of Embedded Items
1. Set and build into the work, anchorage devices and other embedded items required for work by others that is attached to or supported by cast-in-place concrete. Use shop drawings, diagrams, templates and/or instructions provided by suppliers or other trades.
2. Thoroughly brace embedded items to prevent movement during concrete placement. Lace items whenever possible.
3. Ducts, conduits, pipes and their fittings shall be installed below slabs whenever possible. When it is necessary to embed them within a slab, they shall not be larger than 1/3 the thickness of the slab. Do not place adjacent ducts, conduits, or pipes closer than three times the O.D. of the smallest element.
4. Do not cut or move reinforcement to accommodate embedded items without approval of Engineer.

H. Edge Forms: Set edge forms or bulkheads and intermediate screwed strips for slabs to obtain required elevations and contours in the finished slab surface.

I. Cleaning and Tightening:
1. Thoroughly clean forms and adjacent surfaces immediately prior to pouring concrete.
2. Apply form release agent at the rate recommended by the manufacturer.
3. Re-tighten forms immediately after concrete placement as required to eliminate mortar leaks.

3.02 Form Removal

A. Formwork not supporting concrete, such as beams, walls, columns and similar items, may be removed after curing at not less than 50 degrees F for 24 hours after placement, provided concrete is sufficiently hard to not be damaged by form removal. Protection and curing shall be maintained after form removal.

B. Formwork supporting weight of concrete such as soffits, joists, slabs, and other structural elements may not be removed in less than 14 days and not until concrete has attained design minimum 28-day compressive strength.

C. Form-facing material may be removed four days after placement, if shores and other vertical supports have been arranged to permit removal without loosening or disturbing shoring and supports.

3.03 Reuse of Forms

A. Clean and repair surface of forms to be used. Split, frayed, delaminated or otherwise damaged form-facing material shall not be reused.

3.04 Formwork Tolerances

A. Tolerances shall meet requirements of ACI 347.

3.05 Reinforcement Installation

A. Steel Surface Condition
1. Remove dirt, grease, oil, loose mill scale, excessive rust, or foreign matter that may reduce bonding with concrete.
2. Steel with rust or mill scale may be used, provided minimum dimensions, including height of deformations and weight of hand wire-brushed test specimen, are not less than applicable ASTM specification.

B. Bends
1. Inside diameter of bend, other than for stirrups and ties in sizes No. 3 through No. 5, shall not be less than values in ACI 318, Table 7.2.
2. Inside diameter of bend for stirrups and ties shall not be less than 4 x diameter for No. 5 bars and smaller. For bars larger than No. 5, diameter of bend shall be in accordance with Table 7.2.

ACI 318, Table 7.2	
Bar Size	Min. Diameter
No. 3 - No. 8	6 x diam.
No. 9 - No. 11	8 x diam.
No. 14 and No. 18	10 x diam.

C. Hooks: Bends for hooks shall be in accordance with the following table.

Bends	
Bar Size	Min. Diameter
No. 3 - No. 8	4 x diam.
No. 9 - No. 11	5 x diam.
No. 14 and No. 18	6 x diam.

D. Placement
1. Accurately place and adequately secure reinforcement in position with concrete or metal chairs and spacers.
2. Place slab reinforcement in the upper one-third of the slab.
3. Clear distance between bars or layers of bars shall not be less than one inch or less than 1 1/3 times the maximum size aggregate, whichever is greater.
4. Move within tolerances to avoid interference with other reinforcing steel or embedded items.
5. Do not move bars beyond allowable tolerances without approval of Engineer.
6. Do not heat, bend or cut bars without approval of Engineer.
7. Place slab reinforcement in the upper one-third of the slab.

E. Splices
1. Stagger splices in adjacent bars.
2. Lap bars at least 6 inches or 44 bar diameters, whichever is greater.
3. Securely wire so that contact is maintained over entire length of splice.
4. Install splice devices in accordance with manufacturer's instructions.

F. Wire Fabric
1. Install in longest practical length.
2. Lap adjoining pieces one full mesh and tie.
3. Do not make end laps midway between supporting beams or directly over beams of continuous structures.
4. Offset laps in adjacent sheets.
5. Extend to within two inches of edge of slab.

G. Fastening: Tie bars at all intersections where spacing is one foot or greater. Where spacing is less than one foot, tie alternate sections.

H. Protection: Keep reinforcing steel in proper position during concrete placement.

I. Approval: All reinforcing shall be approved by the Engineer or his designated representative prior to placing concrete.

3.06 Reinforcement Tolerances

A. Fabrication
1. Sheared length: ±1 inch.
2. Depth of truss bars: +0 inch to -1/2 inch.
3. Stirrups, ties and spirals: ±1/2 inch.
4. All other bends: ±1 inch.

B. Placement
1. Concrete cover to formed surface: ±1/4 inch.
2. Minimum spacing between bars: ±1/4 inch.
3. Top bars in slabs and beams
   a. Eight inches deep or less: ±1/4 inch.
   b. Eight inches but not over two feet: ±1/4 inch.
   c. More than two feet deep: ±1/2 inch.
   d. Crosswise members: Spaced evenly within ±2 inches.
   e. Lengthwise members: ±2 inches.

C. Maximum bar movement to avoid interference with other reinforcing or embedded items: one bar diameter.

D. Minimum Concrete Cover:
1. Concrete cast against and permanently exposed to earth: …… 3 inches
2. Concrete exposed to earth or weather:
   a. No. 6 through No. 18 bars…….. 2 inches
   b. No. 5 bar, W31 or D31 wire, and smaller…….. 1-1/2 inches
3. Concrete not exposed to weather or in contact with ground:
   a. Slabs, walls, joists:
      1) No. 14 and No. 18 bars…….. 1-1/2 inches
      2) No. 11 bar and smaller…….. 3/4 inches
   b. Beams, columns:
      1) Primary reinforcement, ties, stirrups, spirals…….. 1-1/2 inches
   c. Shells, folded plate members:
      1) No. 6 bar and larger…….. 3/4 inches
      2) No. 5 bar, W31 or D31 wire, and smaller…… 1/2 inches

3.07 Preparation for Concrete Placement

A. Check grades and placement of forms.

B. Remove debris, water, excess form oil etc. from forms.

C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, and anchored securely.

D. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent.

E. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert dowels and pack solid with non-shrink grout.

3.08 Delivery

A. Deliver and discharge concrete within 90 minutes or before 300 drum revolutions, whichever comes first, after the addition of water to the cement.

B. Do not add water to the mix after the initial introduction of water without the approval of the Engineer. If water is added at the jobsite, the concrete shall be mixed a minimum of 30 drum revolutions. Any water added shall not bring the total water in the mix to an amount above the specified water-cement ratio.

C. The temperature of the concrete as delivered shall not exceed a temperature of 90^0F.

D. When the average of the highest and lowest temperature during the period from midnight to midnight is expected to drop below 40^0F for more than three successive days, concrete shall be delivered to meet the following temperature immediately after placement:

Minimum Concrete Temperature	
Section Size	Min. Temperature
<12”	55^0F
12”-36”	50^0F
36”-72”	45^0F
>72”	40^0F

3.09 Placing Concrete

A. Place concrete in accordance with ACI 318.

B. Notify Engineer a minimum of 24 hours prior to concrete placement.

C. Ensure reinforcement, inserts, embedded parts, formed expansion joints and contraction joints are not disturbed during concrete placement.

D. Install vapor retarder under interior slabs on grade. Lap joints a minimum of six inches and seal watertight by taping edges and ends.

E. Deposit concrete as close as practical to its final position. Do not drop concrete more than five feet vertically. Superplasticized concrete may be dropped a maximum of five feet vertically with maximum lift depth of five feet.

F. Place concrete continuously between predetermined construction joints.

G. Do not interrupt the placement. Do not permit cold joints.

H. Thoroughly consolidate concrete by suitable means during placement. Thoroughly work concrete around reinforcement and embedded items and into corners of forms.

I. Install joint devices in accordance with manufacturer's instructions.

3.10 Joints

A. Construction Joints: Joints that are placed at the end of a days work. In slabs they may be placed to permit movement and/or to transfer load.
   1. Horizontal constructions joints will not be permitted except as shown on the Drawings.
   2. For building floor slabs on grade, locate joints a maximum distance apart of three times the slab thickness.
   3. Provide keyways at least 1 1/2 inch deep or steel dowels in all construction joints in walls, slabs, and between footings and walls. See drawing details.

B. Expansion Joints: Joints that separate or isolate slabs from other parts of the structure such as walls, footings, columns, and equipment bases and drives and sidewalks from stairs, walls, light poles and other obstructions.
   1. Separate slabs on grade from vertical concrete surface with 3/4 inch preformed joint filler. Extend joint filler to within 1/8 inch of finished slab surface.

C. Control Joints: Joints in slabs to create planes of weakness so that cracks will occur at desired locations.
   1. Provide joints to form panels or patterns as indicated on the Drawings. If joints are not shown, consult Engineer for joint placement.
   2. Inserts: Form 1/4 inch wide joints, one-fourth the depth of the slab thickness (one inch minimum) by inserting pre-molded hardboard or fiberboard strips into the fresh concrete. The top surface of the strip shall be flush with the slab surface. After concrete has cured for a minimum of seven days remove inserts and clean loose debris from the joints.
   3. Sawed Joints (Normal): Saw joints as soon after concrete is set sufficiently to preclude raveling during sawing and before shrinkage cracking takes place. Saw joints no later than 24 hours after concrete placement. Joints shall be 1/8 inch wide and one-fourth the slab thickness (one inch minimum).
   4. Sawed Joints (Early Entry): Saw joints using the "SOFF-CUT System" or equal. Cut as soon as the slab will support the weight of the saw and the operator (normally within two hours). Joints shall be 1/8 inch wide and ten percent of the slab thickness (depth shall be at least equal to the largest aggregate size).

3.11 Concrete Finishing

A. Provide finishes in accordance with ACI 301, Section 5.

Type	Finish	Comments
1	Screed off	
2	Rough form finish	Patch tie holes and defects. Chip or rub off fins exceeding ¼ in. in height. Leave surfaces with the texture imparted by form.
3	Smooth form finish	Patch tie holes and defects. Remove all fins completely. Comply with rubbed finish.
4	Smooth rubbed finish	Remove forms as early as permitted and perform necessary patching. Produce finish no later than day

		following form removal. Wet surface and rub with carorundum brick or other abrasive until uniform color and texture are produced. Use no cement grout.
5	Floated finish	Place, consolidate, strike off, and level concrete. Float with hand float, bladed power float with flat shoes, or power disk float when bleed water sheen has disappeared and surface has stiffened sufficiently to allow floating.
Type	Finish	Comments
6	Troweled finish	Float surface, then hand or power trowel. Hand trowel surface smooth and free of trowel marks. Continue until ringing sound is produced as surface is troweled. Floors shall be laser screeded.
7	Broom finish	Immediately after surface has been floated, give the surface a course scored texture using a broom.

1. Finish Schedule: Unless otherwise indicated in the Contract Documents, finish concrete surfaces as follows:

Surface	Finish
Buried foundations, footings and footing walls	1 and 2
Buried walls	2
Exposed exterior walls and retaining walls	3
Interior walls	4
Interior process tanks	3
Tank grout and hopper fillets	6
Tank slabs and bases	5 (1 in grouted area)
Interior structural slabs and floors	6
Interior floors to receive quarry or ceramic tile	5
Interior beams, columns, lintels, etc.	4 or 6
Exterior slabs, steps, ramps, and sidewalks	7
Equipment pads and foundations	4 or 6
Concrete topping for precast decks	6
Flumes and open channels	3 or 5

2. In areas with floor drains, maintain floor elevations at walls; pitch surfaces uniformly to drains at 1/4 inch per foot or as indicated on Drawings.

3.12 Curing and Protection

A. General:
   1. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
   2. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
   3. Cover concrete with polyethylene if rain is eminent.
   4. Cure concrete in accordance with ACI 308.

B. Wet Fabric Method
   1. Place wetted burlap on concrete surface when the concrete is still wet, but firm enough to support the burlap without marring the surface. Lay the burlap flat on the concrete surface, overlapping adjacent strips by a minimum of six inches. After forms are removed, cover edge with burlap.
   2. Keep burlap wet for seven days. Add water as necessary by fine spray.

C. Plastic Film/Reinforced Paper Method
   1. Place plastic film or reinforced paper on exposed concrete surfaces when the concrete is still wet, but firm enough to support the burlap without marring the surface. Place the material flat on the surface, without wrinkles. Weight material so that it remains in contact with the concrete. Place soil or wood strips on material edges.
   2. Keep covered for seven days.

D. Liquid Membrane-Forming Curing Compound
   1. Apply after finishing as soon as the free water on the surface has disappeared and no water

sheen is visible, but not so late that the curing compound will be absorbed into the concrete.
2. Apply at a uniform rate of 150 to 200 sq. ft. per gallon. When feasible, apply in two applications at right angles to each other with the second coat being applied within 30 minutes of the first.
3. Coat edges within 30 minutes of form removal.
4. Use Type 2, white pigmented, for concrete exposed to sunlight and Type 1, clear for other concrete.
5. Do not use liquid membrane-curing compound on surfaces that are to receive additional concrete, paint, or tile that requires a positive bond, unless it has been demonstrated that the membrane can be satisfactorily removed or that it can serve as a satisfactory base.

E. Curing/Sealing Material
1. Use for sidewalk and driveways.
2. Cure and seal concrete with a uniform coating of membrane curing/sealing compound.
3. Apply with sprayer in accordance with the manufacturer's printed instructions.
4. Apply two coats at right angles to each other.
5. Do not apply if the temperature of the concrete is less than 40^0F.

3.13 Floor Sealing

A. Unless indicated elsewhere, seal interior concrete floors.

B. Apply the sealer in accordance with the manufacturer's instructions.

3.14 Field Quality Control

A. Sampling and testing shall be the responsibility of the Contractor. See Section 01 45 16 Testing Requirements.

B. Provide free access to Work and cooperate with testing personnel.

C. Four concrete test cylinders will be taken for every 75 or less cubic yards of each class of concrete placed in one day. Test cylinders will be lab cured. One test cylinder will be broken at 7 days, two at 28 days and one will be held.

D. Engineer may cast additional test cylinders for field curing cold or hot weather may affect curing.

E. One slump test, one air test and the concrete temperature will be taken for each set of test cylinders taken.

F. Sampling and testing will be performed in accordance with the following:
4. Concrete samples: ASTM C172.
5. Test cylinders: ASTM C31.
6. Slump tests: ASTM C143.
7. Air test: ASTM C231.

G. In addition to providing test results to the Engineer, provide the test results to the concrete supplier.

3.15 Patching

A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.

B. Honeycomb, embedded debris, and tie holes are not acceptable.

C. Patch imperfections in accordance with ACI 301, Section 5.

3.16 Defective Concrete

A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

B. Repair or replacement of defective concrete will be determined by the Engineer.

END OF SECTION

SECTION 03 31 01

SITEWORK CONCRETE

PART 1 - GENERAL

1.01 Section Includes

A. Cast-in-place concrete for curb and gutter, sidewalk, exterior slabs, and other similar exterior concrete. Does not include concrete pavement.

1.02 Related Sections

A. Section 01 45 16 – Testing Requirements.

1.03 References

A. ACI 301 - Specifications for Structural Concrete.

B. ACI 305R - Hot Weather Concreting.

C. ACI 306R - Cold Weather Concreting.

D. ACI 308 - Standard Practice for Curing Concrete.

E. ASTM A185 - Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.

F. ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

G. ASTM C31 - Making and Curing Concrete Test Specimens in the Field.

H. ASTM C33 - Standard Specification for Concrete Aggregates.

I. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

J. ASTM C94 - Standard Specification for Ready-Mixed Concrete.

K. ASTM C143 - Standard Test Method for Slump of Hydraulic Cement Concrete.

L. ASTM C150 - Standard Specifications for Portland Cement.

M. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.

N. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete.

O. ASTM C260 - Air Entraining Admixtures for Concrete.

P. ASTM C494 - Chemical Admixtures for Concrete.

Q. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

R. ASTM C618 - Coal Fly Ash and Raw or Calcinated Natural Pozzolan for Use as a Mineral Admixture in Portland Cement.

S. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds having Special Properties for Curing and Sealing.

T. ASTM D1751 - Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

U. ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

1.04 Quality Assurance

A. Perform concrete work in accordance with ACI 301.

B. Conform to ACI 305R when concreting in hot weather and ACI 306R when concreting in cold weather.

1.05 Submittals

A. Concrete Mix Design
   1. Provide dry weight of cement, saturated-surface dry weight of aggregate, brand name, type, and quantity of admixtures, and pounds of water per cubic yard of concrete.
   2. Test data supporting the portions of the design mixes based on laboratory trial batches in accordance with ACI 318. Test data supporting the proportions of the design mixes based on past field experience in accordance with ACI 318 may be provided in lieu of the laboratory data.

B. Admixtures: Submit manufacturer's literature and certifications.

C. Delivery Tickets: Provide for each load of concrete delivered; include the following information: Name of ready-mix batch plant, serial number of ticket, date, truck number, name of contractor, name and location of job, class of concrete, amount of concrete in cubic yards, time loaded or of first mixing of cement and aggregate, water added at jobsite and initials of person authorizing addition, admixtures, if added.

D. Test Results.

PART 2 - PRODUCTS

2.01 Reinforcement

A. Reinforcing Steel: ASTM A615; Grade 60, deformed, unfinished.

B. Welded Steel Wire Fabric: ASTM A185: flat sheets, unfinished.

2.02 Concrete Materials

A. Portland Cement: ASTM C150, Type 1.

B. Aggregate: ASTM C33.

C. Water: Clean and not detrimental to concrete.

D. Flyash: ASTM C618, Class C.

2.03 Concrete Admixtures

A. Air Entrainment: ASTM C260.

B. Water Reducing: ASTM C494; Type A, Water Reducing.

C. Retarding: ASTM C494. Type D, Water Reducing and Retarding.

D. Accelerating: ASTM C494 Type C Accelerating (non-chloride); Type E, Water Reducing and Accelerating (non-chloride).

2.04 Accessories

A. Curing Material: Liquid membrane curing compound; ASTM C309, Type 2, white pigmented.

B. Curing/Sealing Material:
   1. An acrylic resin curing, sealing, and hardening compound for exterior freshly placed concrete that provides a durable, long-lasting moisture impermeable finish that improves resistance to chemicals, grease, and de-icing salts.

2. Meet requirements of ASTM C1315, Type 1, Class B and ASTM C309, Type 1, Classes A and B.
3. Manufacturer: AS-1 Achro Seal 1315 OTC, TK Products; Seal Cure 309-30, W.R. Meadows; or equal.

C. Preformed Expansion Joint Fillers: ASTM D1751 or ASTM D1752.

2.05 Concrete Mix Design

A. Mix and deliver concrete in accordance with ASTM C94.

B. Select proportions in accordance with ACI 301.

C. Provide concrete in accordance with the following requirements:
a. Concrete Mixes

Concrete Mixes		
Class	Compressive Strength at 28 days, psi	Max. Water-Cement Ratio By Weight
Air-Entrained Concrete		
D	4,000	0.48

2. Air Content: Total air content (entrained and entrapped) for air-entrained concrete shall be in accordance with the following table:

Air Content	
Nominal Max.Size Aggregate	Air Content
¾"	6% ± 1
1"	6% ± 1
1 ½"	5% ± 1

3. In any mix, up to 20 percent of the cement (on a pound per pound basis) may be replaced with flyash.

D. Slump: 3 inches plus or minus 1 inch.

PART 3 - EXECUTION

3.01 Preparation for Concrete Placement

A. Check grades, infill deficient areas as needed. Native material can be used when permitted by the Owner /Engineer. The Contractor is responsible for disposal of the excess material.

B. Check placement of forms.

C. Remove debris, water, excess form oil etc. from forms.

D. Verify that anchors, seats, plates, reinforcement, inlet castings, and other items to be cast into concrete are accurately placed, and anchored securely.

E. Provide a minimum cover of 1-1/2 inch for reinforcing bars.

F. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent.

G. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert dowels and pack solid with non-shrink grout.

3.02 Delivery

A. Deliver and discharge concrete within 90 minutes or before 300 drum revolutions, whichever comes first, after the addition of water to the cement.

B. Do not add water to the mix after the initial introduction of water without the approval of the Engineer. If water is added at the jobsite, the concrete shall be mixed a minimum of 30 drum revolutions. Any water added shall not bring the total water in the mix to an amount above the specified water-cement ratio.

C. The temperature of the concrete as delivered shall not exceed a temperature of 90^0F.

D. When the average of the highest and lowest temperature during the period from midnight to midnight is expected to drop below 40^0F for more than three successive days, concrete shall be delivered to meet the following temperature immediately after placement:

Minimum Concrete Temperature	
Section Size	Min. Temperature
<12"	55^0F
12"-36"	50^0F
36"-72"	45^0F
>72"	40^0F

3.03 Placing Concrete

A. Place concrete in accordance with ACI 318.

B. Notify Engineer a minimum of 24 hours prior to concrete placement.

C. Ensure reinforcement, inserts, embedded parts, formed expansion joints and contraction joints are not disturbed during concrete placement.

D. Deposit concrete as close as practical to its final position. Do not drop concrete more than five feet vertically.

E. Place concrete continuously between predetermined construction joints.

F. Do not interrupt the placement. Do not permit cold joints.

G. Thoroughly consolidate concrete by suitable means during placement. Thoroughly work concrete around reinforcement and embedded items and into corners of forms.

3.04 Joints

A. Construction Joints: Joints that are placed at the end of a days work. In slabs they may be placed to permit movement and/or to transfer load.

B. Expansion Joints: Joints that separate or isolate slabs from other parts of the structure such as walls, footings, columns, and equipment bases and drives and sidewalks from stairs, walls, light poles and other obstructions. Separate slabs on grade from vertical concrete surface with 1/2- inch preformed joint filler. Filler shall extend the full depth of the concrete with the top slightly lower than the concrete surface.

C. Control Joints: Joints in slabs to create planes of weakness so that cracks will occur at desired locations.
   1. Provide joints to form panels or patterns as indicated on the Drawings. If joints are not shown, consult Engineer for joint placement.
   2. Inserts: Form 1/4 inch wide joints, one-fourth the depth of the slab thickness (one inch minimum) by inserting pre-molded hardboard or fiberboard strips into the fresh concrete. The top surface of the strip shall be flush with the slab surface. After concrete has cured for a minimum of seven days remove inserts and clean loose debris from the joints.
   3. Sawed Joints (Normal): Saw joints as soon after concrete is set sufficiently to preclude raveling during sawing and before shrinkage cracking takes place. Saw joints no later than 24 hours after concrete placement. Joints shall be 1/8 inch wide and one-fourth the slab thickness (one inch minimum).
   4. Sawed Joints (Early Entry): Saw joints using the "SOFF-CUT System" or equal. Cut as soon as the slab will support the weight of the saw and the operator (normally within two hours). Joints shall be 1/8 inch wide and ten percent of the slab thickness (depth shall be at least equal to the largest aggregate size).

3.05 Concrete Finishing

A. Provide finish in accordance with ACI 301, Section 5.

B. Unless indicated otherwise, provide a broom finish for concrete for curb and gutter, sidewalk, and exterior slabs. Immediately after the concrete has been floated, give the surface a course scored texture using a broom.

3.06 Curing and Protection

A. General:
   1. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
   2. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
   3. Cover concrete with polyethylene if rain is eminent.
   4. Cure concrete in accordance with ACI 308.

B. Liquid Membrane-Forming Curing Compound (Curb and Gutter):
   1. Apply after finishing as soon as the free water on the surface has disappeared and no water sheen is visible, but not so late that the curing compound will be absorbed into the concrete.
   2. Apply at a uniform rate of 200 sq. ft. per gallon. When feasible, apply in two applications at right angles to each other with the second coat being applied within 30 minutes of the first.
   3. Coat edges within 30 minutes of form removal.

C. Curing/Sealing Compound (Sidewalk):
   1. Cure and seal concrete with a uniform coating of membrane curing/sealing compound.
   2. Apply with sprayer in accordance with the manufacturer's printed instructions.
   3. Apply two coats at right angles to each other.
   4. Do not apply if the temperature of the concrete is less than 40^0F.
   5. Protect concrete from all traffic for three days and from vehicular traffic for seven days.

3.07 Field Quality Control

A. Sampling and testing shall be the responsibility of the Contractor. See Section 01 45 16 Testing Requirements.

B. Provide free access to Work and cooperate with testing personnel.

C. Four concrete test cylinders will be taken for every 75 or less cubic yards of each class of concrete placed in one day. Test cylinders will be lab cured. One test cylinder will be broken at 7 days, two at 28 days and one will be held.

D. Engineer may require the casting additional test cylinders for field curing when cold or hot weather may affect curing.

E. One slump test, one air test and concrete temperature will be taken for each set of test cylinders.

F. Sampling and testing will be performed in accordance with the following:
   1. Concrete samples: ASTM C172.
   2. Test cylinders: ASTM C31.
   3. Slump tests: ASTM C143.
   4. Air test: ASTM C231.

G. In addition to providing test results to the Engineer, provide the test results to the concrete supplier.

3.08 Patching

A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.

B. Honeycomb, embedded debris, and tie holes are not acceptable.

C. Patch imperfections in accordance with ACI 301, Section 5.

3.09 Defective Concrete

A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

B. Repair or replacement of defective concrete will be determined by the Engineer.

END OF SECTION

SECTION 04 05 13

MORTAR AND GROUT

PART 1 - GENERAL

1.01 Section Includes

A. Mortar and grout for masonry.

1.02 References

A. ASTM C91 - Standard Specification for Masonry Cement.

B. ASTM C144 - Standard Specification Aggregate for Masonry Mortar.

C. ASTM C150 - Standard Specification for Portland Cement.

D. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes.

E. ASTM C270 - Standard Specification for Mortar for Unit Masonry.

F. ASTM C387 - Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.

G. ASTM C404 - Standard Specification for Masonry Grout.

1.03 Delivery, Storage and Handling

A. Deliver and store manufactured products in original unopened containers.

B. Store cementitious ingredients in weather-tight enclosure.

C. Stockpile and handle aggregates in such a manner so as to prevent segregation and contamination.

D. Protect admixtures from excessive temperature changes.

1.04 Environmental Requirements

A. Heat mixing water when air temperature is below 40^0 F and heat aggregates when air temperature is below 32^0 F, to assure mortar temperatures between 40^0 F and 120^0 F until used.

B. Produce subsequent mortar batches within 10^0 F of first batch.

C. Do not heat water or sand above 120^0 F.

1.05 Submittals

A. Submit product data for premixed mortar.

B. Submit mix design for mortar types to be mixed at the site.

PART 2 - PRODUCTS

2.01 Materials

A. Portland Cement: ASTM C150, Type I.

B. Masonry Cement: ASTM C91.

C. Mortar Aggregate: ASTM C144; clean, dry, and free of foreign matter, meeting following gradation:

Mortar Aggregate Gradation		
	Percent Passing	
Sieve Size	Natural Sand	Manufactured Sand
No. 4	100	100
No. 8	95 - 100	95 - 100
No. 16	70 - 100	70 - 100
No. 30	40 - 75	40 - 75
No. 50	10 - 35	20 - 40
No. 100	2 - 15	10 - 25
No. 200	0 - 5	0 - 10

D. Grout Aggregate: ASTM C404, maximum 3/8 inch size.

E. Hydrated Lime: ASTM C207, Type S.

F. Premix Mortar: ASTM C387.

G. Clean and potable.

2.02 Mortar Color

A. Mineral oxide pigment; Western Lime and Cement, Medusa or equivalent. Color to be selected by Owner.

2.03 Admixtures

A. Polymeric Water Repellent: Rheopel by Rheomix or equal.

B. Other Admixtures: None permitted.

2.04 Mortar Mixes

A. Meet requirements of ASTM C270. Provide types in accordance with the following table.

Selection of Masonry Mortars		
Location	Building Segment	Mortar Type
Exterior, above grade	Load bearing wall	N
	Non-load bearing wall	N
	Parapet wall	N
Exterior, at or below grade	Foundation wall, retaining wall, manholes, sewers, pavements, walks	M
Interior	Load bearing wall	N
	Non-bearing partitions	O
Interior/Exterior, Above/below grade	Walls subject to high flexural stresses, walls over 16’ in height	S

2.05 Mixing Mortar

A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270.

B. Add mortar color, if required, in accordance with the manufacturer’s instructions. Provide uniformity of mix and coloration.

C. Add water repellent admixture when mortar is to be used for concrete block in exterior walls or at wet locations.

D. Use mortar within two hours after mixing.

2.06 Grout Mixes

A. Bond Beams and Lintels: 3,000 psi strength at 28 days; 7 to 8 inch slump.

PART 3 - EXECUTION

3.01 Installation

A. Install mortar as indicated in individual masonry sections.

B. Work grout into masonry cores and cavities to eliminate voids. Do not displace reinforcement while placing grout.

END OF SECTION

SECTION 04 43 13

STONE MASONRY

PART 1 - GENERAL

1.01 Section Includes

A. Stone veneer for concrete piers.

B. Stone caps.

1.02 Related Sections

A. Section 04 05 13 - Mortar and Grout.

1.03 References

A. ASTM C97 - Standard Specification for Absorption and Bulk Specific Gravity of Dimension Stone.

B. ASTM C170 - Standard Specification for Compressive Strength of Dimension Stone.

C. ASTM C568 - Standard Specification for Limestone Dimension Stone.

D. ASTM C880 - Standard Specification for Flexural Strength of Dimension Stone.

E. ACI 530.1/ASCE 6/TMS 602 - Specifications for Masonry Structures.

1.04 Submittals

A. Product data for natural dimensional stone.

B. Selection Samples: For each stone product specified, submit two samples, minimum size 6 inches long, representing color range, surface, and texture.

1.05 Quality Assurance

A. Manufacture’s qualifications: Company owning and operating stone quarry and specializing in quarrying, cutting, and dressing natural stone for masonry assemblies with 5 years minimum successful experience.

B. Installer qualifications: Company specializing in performing stone masonry work with 5 years documented, successful experience.

C. Mock-Up: Provide a mock-up for evaluation of the stone, mortar color, and application workmanship. Mock-up shall be the same size as one surface of the concrete pier.

1.06 Delivery, Storage, and Handling

A. Deliver, store, and handle stone units in a manner to avoid chipping, breakage, marring faces, and contact with contaminating materials.

B. Store stone on wood pallets and store on dry, level surface. Cover pallets with tarps. Do not stack pallets or allow them to sit in standing water.

1.07 Environmental Requirements

A. Maintain materials and surrounding air temperature to following limits prior to, during, and 24 hours after completion of masonry veneer.
   1. Minimum 40^0 F.
   2. Maximum 90^0 F.

B. Hot and Cold Weather Requirements: In accordance with ACI 530.1/ASCE 6/TMS 602 Specifications for Masonry Structures.

C. When ambient temperature falls below 50^0 F, heat mortar mixing water

PART 2 - PRODUCTS

2.01 Acceptable Manufacturers

A. Acceptable Stone Quarrier: Buechel Stone Corporation; 800.236.4473 or equal.

2.02 Natural Limestone Veneer

A. Fond du Lac Rustic:
   1. Nominal size range:
      a. Length: 6 inches 18 inches.
      b. Height: 1 3/4 to 3 1/4 inches.
      c. Width: 3 to 5 inches
   2. Color range: brown, buff, tan, and gold.
   3. Color consistency: consistent.
   4. Ends: square.
   5. Properties for limestone complying with ASTM C568:
      a. Maximum absorption rate tested in accordance with ASTM C97: 3 percent.
      b. Minimum density tested in accordance with ASTM C97: 2,560 kg per cubic meter.
      c. Minimum compressive strength tested in accordance with ASTM C170: 55 Mpa.
      d. Minimum flexural strength tested in accordance with ASTM C 880: 8.27 Mpa.

2.03 Cast Limestone Cap

A. Acceptable Provider: County Materials; 608-845-8636 or equal.
A. Heritage Cast Stone Cap:
   1. Nominal Size: 2’-4” x 2’-4” x 4” beveled from corners to a 10”x10” flat top, Owner to provide shop drawing prior to fabrication.
   2. Finish: Smooth
   3. Color: Buckskin
   4. Properties for limestone complying with ASTM C568:
      a. Maximum absorption rate tested in accordance with ASTM C97: 3 percent.
      b. Minimum density tested in accordance with ASTM C97: 2,560 kg per cubic meter.
      c. Minimum compressive strength tested in accordance with ASTM C170: 55 Mpa.
      d. Minimum flexural strength tested in accordance with ASTM C 880: 8.27 Mpa

PART 3 - EXECUTION

3.01 Preparation

A. Clean surfaces thoroughly.

B. Prepare surfaces in accordance with manufacturer’s recommendations.

3.02 Installation

A. Install stone and mortar in accordance with the manufacturer's instructions and in accordance with ACI 530.1

B. Stone installation:
   1. Layout work area in advance and distribute color range of stone uniformly over total work area.
   2. Coursing patterns: To match approved mock-up. Arrange stone pattern to provide color and uniformity, visual variations, blend of sizes, and regularity and neat appearance of joints. Exercise care to avoid concentration of any one color on any one wall surface. Do not use stacked vertical joints.
   3. Joints: Lay stone with 1/2 inch approximate mortar joints.
      a. Fill joints with grouting mortar. Pack and work into voids.
      b. When thumb-print hard, neatly tool surface to concave joint with round jointer slightly larger than joint width.

C. Remove excess mortar as work progresses to prevent staining.

D. Remove units disturbed after laying, clean, and relay with fresh mortar. If adjustments are required, remove units, clean off mortar, and reset with fresh mortar.

E. Exercise care that wet mortar is not splashed onto stone face during installation. Excess or splashed mortar shall be cleaned from face with dry burlap wipe. Remove excess mortar after mortar becomes hard enough not to smear but prior to mortar setting.

F. Ensure that sealant materials are not smeared onto stone faces. Remove as recommended by manufacturer.

G. Joining Work: Where fresh masonry joins partially set masonry.
   1. Remove loose stone and mortar.
   2. Clean and lightly wet surface of set masonry.
   3. To avoid a horizontal run of masonry, rack back 1/2 the length of stone in each course.
   4. Toothing is not permitted.

3.03 Cleaning

A. Keep face of stone free of mortar as work progresses.

B. Remove excess mortar and mortar smears as work progresses.

C. Allow walls to air dry. Brush off mortar with stiff fiber brush. Do not use metallic tools for cleaning.

D. Contact stone manufacturer for detailed cleaning if chemicals are required.

3.04 Protection

A. Protect installed products until completion of project.

B. Cover the top of unfinished stone masonry work at the end of each workday to protect it from the weather.

C. Touch-up, repair or replace damaged products before substantial completion.

END OF SECTION

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 - GENERAL

1.01 Section Includes

A. Provide:
   1. Dimensional Lumber
   2. Boards.
   3. Miscellaneous lumber:
      a. Blocking:
         1) Fire-treated.
   4. Plywood:
      a. Backing panels.
      b. Blocking.
      c. Wall sheathing.
      d. Underlayment.
   5. Wood treatment:
      a. Pressure-preservative.
      b. Fire-retardant.
   6. Rough carpentry accessories including, but not limited to:
      a. Framing anchors and fasteners.
      b. Building paper.

1.02 Related Sections

A. Section 06 17 53 – Prefabricated Wood Trusses.

1.03 References

A. ANSI:
   1. A194 – Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature.
   2. A208.1 – Mat-formed Wood Particleboard.

B. ALSC - American Lumber Standards Committee.

C. Engineered Wood Association (APA):
   1. E30 – Design/Construction Guide – Residential and Commercial.
   2. E445 – Performance Standard and Policies for Structural-use Panels.

D. AWPA U1 (American Wood Preservers Association) - Preservative Treatment by Pressure Process.

E. NFPA - National Forest Products Association.
   1. Recommended Nailing Schedule
   2. Manual for Wood Frame Construction
   3. National Design Specifications for Wood Construction.

1.04 Inspection Agencies

A. SPIB - Southern Pine Inspection Bureau.

B. WWPA - Western Wood Products Association.

1.05 Quality Assurance

A. Lumber Grading Agency: ALSC.

B. Plywood Grading Agency: API.

C. Grading Marks: Identify grade and official trademark of grading agency.

D. Lumber shall be sound, thoroughly seasoned, well manufactured, and free from warp that cannot be corrected by bridging or nailing.

E. Corrosion of steel is an issue when in contact with fire-retardant treated (FRT) wood at high moisture content levels. For FRT wood, the company providing the treatment should be contacted.

PART 2 - PRODUCTS

2.01 Materials

A. Lumber, General:
1. Lumber Standards: Manufacture lumber to comply with DOC PS 20, applicable grading rules of referenced inspection agencies certified by ALSC Board of Review.
2. Grade Stamps: Factory-mark each piece with grade stamp of inspection agency evidencing compliance with grading rule requirements, grading agency, grade, species, moisture content at time of surfacing, and mill.
3. Nominal Sizes:
   a. As indicated, except as shown by detail dimensions.
   b. Actual sizes required by PS 20, moisture content specified for each use.
   c. Dressed lumber, S4S, unless otherwise indicated.
   d. Seasoned lumber with 19 percent maximum moisture content at time of dressing and shipment for sizes 2 inches or less nominal thickness, unless otherwise indicated.

B. Dimension Lumber:
1. Other Light Framing: “Construction” grade lumber, 2 inches to 4 inches thick, 2 inches or wider, any suitable species.

C. Boards:
1. Exposed:
   a. Where exposed in finished work: Moisture content 19 percent maximum, “S-DRY.”
   b. Where painted finish indicated: Southern Pine, No. 2 boards per SPIB, or Douglas Fir Construction boards per WCLIB or WWPA.
2. Sizes: As indicated or, if not indicated, 1-inch by 8-inch boards.

D. Miscellaneous Lumber: Wood for support or attachment of other work, of sizes indicated, worked into shapes shown, and as follows:
1. Moisture content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.
2. Grade:
   a. Standard grade light framing size lumber, any species or board size lumber as required.
   b. No. 3 Common or Standard grade boards per WCLIB or WWPA rules or No. 3 boards per SPIB rules.

E. Plywood Panels:
1. Comply with PS 1. For products not manufactured under PS 1 provisions, comply with APA E445.
2. Trademark: Factory-mark each panel with APA trademark evidencing compliance with grade requirements.
3. Provide exterior grade plywood at all locations unless specified otherwise.
4. Concealed APA Performance-Rated Panels: Comply with requirements indicated for grade designation, span rating, exposure durability classification, edge detail where applicable, thickness.
5. Type of Use:
   a. Sheathing:
      1) Grade: APA C-D, exterior glue.
      2) Pressure preservative treated for roof parapet, curbs, etc.
      3) Thickness as indicated but at least 5/8 inch.
      4) Size: 4 feet by 8 feet.
   b. Underlayment:
      1) Grade: APA, UL, plugged with exterior glue.
      2) Thickness as indicated but minimum 3/4 inch.
      3) Size: 4 feet by 8 feet wherever possible.

4) Configuration: Tongue and groove.

c. Plywood backing panels:

1) Mounting electrical or telephone equipment: Fire-retardant treated plywood panels with grade designation, APA C-D PLUGGED INT with exterior glue, thickness indicated, or, if not otherwise indicated, not less than 1/2 inch nominal.

2) Grab bar mounting:

a) APA C-D exterior glue.

b) Thickness as indicated, 5/8-inch minimum.

F. Gypsum Sheathing:

1. See Section 09 29 00.

G. Miscellaneous Materials:

1. Fasteners, Anchorages:

a. Size, type, material, finish indicated and recommended by applicable standards, Federal Specifications, and manufacturer for each use, including recommended nails.

b. Where rough carpentry work exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners, anchorages with hot-dip zinc coating (ASTM A153).

2. 3. Plywood Sheathing Clips: *Simpson PSC*.

4. Adhesives for field gluing panels to framing: Formulation complying with APA AFG-01 or ASTM D3498 that is approved for use with type of construction panel indicated by both adhesive and panel manufacturers, with VOC content not more than 70 g/L.

H. Wood Treatment by Pressure Process:

1. Preservative treatment for wood indicated as PT or specified to be treated:

a. Mark each treated item with AWPA Quality Mark requirements.

b. Complete fabrication of treated items prior to treatment whenever possible.

c. It cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment.

d. Inspect each piece after drying, discard damaged or defective pieces.

e. For above ground items, kiln-dry to maximum moisture content of 19 percent or that allowed by National Grading Rules for the species and size specified to be dried.

f. Comply with the following AWPA U1 standards:

1) UC3A: Exterior, above ground, coated and rapid water runoff, such as coated millwork, siding, and trim.

2) UC3B: Exterior, above ground, uncoated or poor water runoff such as decking, railings, fence posts, uncoated millwork.

3) UC4A: Ground contact or fresh water such as fence, deck, guardrail and utility posts (low decay areas).

4) UC4B: Ground contact or fresh water, difficult replacement (high decay areas).

5) UC4C: Ground contact or fresh water, critical structural components such as foundation piling (severe decay areas).

PART 3 EXECUTION

3.01 Examination

A. Work of Other Trades: Prior to commencing work, carefully inspect and verify that work is complete to point where this installation may properly commence.

B. Verification of Conditions: Verify that rough carpentry may be installed in accordance with original design, pertinent codes and regulations, and pertinent portions of referenced standards.

C. Discrepancies:

1. Immediately notify Architect.
2. Do not proceed with installation in areas of discrepancy until fully resolved.
3. Commencement of installation signifies acceptance of surface conditions.

3.02 Installation, General

A. Coordinate and fit carpentry work to other Work.

1. Scribe, cope as required for accurate fit.

2. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other Work.

B. Set carpentry work to required levels and lines, with members plumb and true to line, cut, and fitted.

C. Defective Units: Discard if defects might impair quality of work, or if units are too small to use in fabricating work with minimum joints or optimum joint arrangement.

D. Fastening:
1. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards.
2. Countersink nail heads on exposed carpentry work, fill holes.
3. Make tight connections between members.
4. Install fasteners without splitting of wood, pre-drill as required.

3.03 Wood Grounds, Nailers, Blocking, Sleepers

A. Provide where shown and where required for screeding or attachment of other work.

B. Form to shapes shown and cut as required for true line and level of work to be attached.

C. Coordinate location with other work involved.

D. Attach to Substrates:
1. As required to support applied loading.
2. Countersink bolts, nuts flush with surfaces, unless otherwise indicated.
3. Build into masonry during installation of masonry work.
4. Where possible, anchor to formwork before concrete placement.

E. Grounds:
1. Permanent, of dressed, preservative treated, key-beveled lumber.
2. Not less than 1-1/2 inches wide.
3. Thickness required to bring face of ground to exact thickness of finish material involved.
4. Remove temporary grounds when no longer required.

F. Blocking:
1. Provide 2 by 8 wood blocking behind wall-mounted fixtures.
2. Window treatment blocking shall extend 8 inches minimum beyond window opening.
3. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

3.04 Wood Furring

A. Installation:
1. Plumb, level with closure strips at edges and openings.
2. Shim with wood as required for tolerance of finished work.
3. Provide fire treated wood for all furring.
4. Firestop furred spaces on walls at each floor level and at ceiling line of top story, with wood blocking or noncombustible materials, accurately fitted to close furred spaces.

3.05 Wood Framing, General

A. Framing Members:
1. Sizes, on spacings shown, frame openings as shown, or if not shown, comply with recommendations of NFPA “Manual for Wood Frame Construction.”
2. Do not splice structural members between supports.

B. Anchor and nail as shown, and to comply with “Recommended Nailing Schedule” of “Manual for Wood Frame Construction” and “National Design Specifications for Wood Construction” published by NFPA.

3.06 Installation of Construction Panels

A. Plywood Installation:
   1. Comply with applicable recommendations contained in Form No. E30, “APA Plywood Design/Construction Guide,” Residential and Commercial,” for types of plywood products and applications indicated. Comply with “CodePlus” provisions of above referenced guide.
   2. Fastening Methods:
      a. Plywood Backing Panels: Nail or screw to supports.

3.07 Schedules

A. Nailing Schedule: Comply with “Nailing Schedule” in International Building Code 2304.9, unless more stringent requirements are specified.

B. Pressure Treated Wood Preservative: Where indicated on Drawings or if not indicated, including but not limited to:
   1. Sill plates in contact with concrete or masonry.
   2. Roof blocking and framing used for single membrane roofing.

3.08 Cleaning

A. Do not allow accumulation of scraps and debris. Maintain premises in neat, orderly condition at all times.

END OF SECTION

SECTION 06 10 10

HEAVY TIMBER AND LUMBER PRODUCTION

PART 1 - GENERAL

1.01 Section Includes

A. Production of rough sawed heavy timbers and lumber from logs provided by Contractor.

1.02 Quality Assurance

A. A firm with a minimum of five years experience in the rough sawing of heavy timber and lumber.

1.03 Storage

A. Store rough sawn heavy timber and lumber covered with temporary corrugated roof.

B. Provide wood strips in between each layer to provide good air flow.

C. Immediately after sawing apply end seal to the timbers and boards.
   1. End Seal: A polymer and petroleum wax designed for sealing the ends of logs and lumber.
   2. Anchor 2® Hybrid End Sealer or equal.

PART 2 - PRODUCTS

2.01 General

A. Portable Sawmill:
   1. Provide portable sawmill capable of sawing minimum 36-Inch diameter and minimum 21-foot long logs.
   2. Wood-Mizer LT40 Sawmill or equal.

B. Check logs for metal both visually and magnetically. Clean mud from logs.

2.02 Heavy Timber and Lumber

A. Finish: Rough sawn.

B. Length: Minimum 8 to 12 feet.

C. Rough Sawn Dimensions:
   1. Heavy Timber (5” x 5” and greater): Rough sawn dimensions shall be 1 inch all around greater than the finished dimensions.
   2. Lumber (less than 5” x 5”): Rough sawn dimensions shall be 3/8 inch all around greater than the finished dimensions.

2.03 Species

A. Use logs of the following species:
   1. Heavy Timber: Douglas fir-larch, red oak, white oak, basswood, black walnut, black cherry, hard maple, or hickory.
   2. Lumber: Red oak, white oak, ash, basswood, black walnut, black cherry, hard maple, soft maple, or hickory.

PART 3 - EXECUTION

3.01 Performance

A. Choose logs of the appropriate species for the material to be processed.

B. Provide quantity of sizes and lengths as requested by Owner in the Contract Documents.

C. Choose logs for the most efficient timber and lumber production.

D. Store timbers and lumber in accordance with 1.03 above and at the location designated by the Owner.

3.02 Clean Up

A. Clean up saw site from all waste wood products and saw dust.

END OF SECTION

SECTION 06 13 26

HEAVY TIMBER CONSTRUCTION

PART 1 - GENERAL

1.01 Section Includes

A. Fabrication and installation of heavy timber beams, columns, & trusses.

B. Perform all work required to properly complete the heavy timber work as shown on the drawings and as specified herein.

C. Provide all labor, staging, scaffolding, temporary bracing, crane, hoists, rigging, equipment, materials, and services necessary to perform the Work of this Section. The work includes, but is not necessarily limited to the following:
   1. Timber components of every description, including beams, girts, columns, plates, braces, ties, pegs, webs.
   2. Miscellaneous hardware for heavy timber construction, including but not limited to connectors and bolts.

1.02 Related Sections

A. 06 10 10 - Heavy Timber and Lumber Production.

1.03 References

A. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, Threaded Rod 60,000 PSI Tensile Strength.

1.04 Submittals

A. Shop Drawings: Submit shop drawings in accordance with Section 3 of the Conditions of Contract. Shop Drawings shall include the following:
   1. Small scale plans and elevations showing all truss members, joints and methods of assembly. Shop Drawings shall include details for every member and connection and shall show connector plates, pegs, mortises, tenons, lengths, angles of cut, etc.

1.03 Measurements

A. Verify all measurements and conditions at the building as required for the proper installation of the work. Contractor shall be responsible for the accuracy and fit of the various parts of his work

1.04 Delivery, Storage, and Handling

A. Protect materials and keep under cover in transit and at the job site. Stack to ensure proper ventilation and drainage. Store under cover in a well-ventilated area. Materials damaged in shipment or at the job site shall be repaired or replaced at no cost to the Owner.

PART 2 - PRODUCTS

2.01 Wood Materials

A. Provide rough timbers and lumber in accordance with Section 06 10 10.

B. Rough Heavy Timber and Lumber Dimensions:

1. Heavy Timber (5” x 5” or greater): 1” wider on all four sides than finished dimensions.
2. Lumber (less than 5” x 5”): 3/8” wider on all four sides than finished dimensions.

C. Grading: Visually grade timbers and lumber and use only material that meets the following grades.
1. Heavy Timbers: No.2 - Well-spaced knots of any quality uo to 2”, with one hole up to 1-1/4” per 2’ lineal. Wane and skips are included.
2. Lumber: No. 3 - Knots of any quality can be up to 2-1/2”, with one hole up to 1-3/4” per lineal foot. Wane and skips are included.

D. Mill to required finished dimensions. Provide S4S.

2.02 Pegs

A. Peg material shall be straight grained, all heartwood, knot free, and reaction free from oak.

2.03 Miscellaneous Hardware

A. Bolts and Rods: Galvanized Steel, ASTM A307.

B. Washers and Nuts: Galvanized steel.

C. Connectors: Tmberlinx or equal.

2.04 Finish

A. An oil modified water base urethane manufactured with Nano Particle technology to provide protection against abrasion, UV light, and moisture and water and dirt repellency.

B. Rain Wet Sheen by Rymar Industries (sold by Sherwin Williams) or equal.

C. Color: To be selected by Owner.

PART 3 - EXECUTION

3.01 Truss Fabrication

A. Shop fabricate trusses in accordance with the Drawings, the approved Shop Drawings, code requirements, and the best trade practices.

B. All joinery shall be accurately cut so as to make a neat, snug fit.

C. Disassemble the trusses for shipment to job site.

3.02 Finishing

A. Provide a three coat urethane system on all four sides of the trusses and columns prior to shipment to job site.

B. Provide a three coat urethane system on the exposed side of the roof decking.

C. Apply coating in accordance with the manufacturer’s printed instructions.

3.03 Erection

A. Check truss components and assemblies for dimensions and anchorage accuracy before erection.

B. Temporary bracing and guy lines shall be provided to adequately protect all persons and property and to insure proper alignment.

C. Padding or non-marking slings shall be used, and corners shall be protected with blocking.

D. The assembled trusses shall be reasonably straight, plumb, level and square. Portions of the structure not adequately braced by design shall have temporary braces until the decking is applied.

E. All joints shall be reasonably tight.

F. Tools used to drive or pull joints together shall not permanently mar the finished surfaces of the trusses.

G. Install roof decking.

END OF SECTION

SECTION 07 61 13

METAL ROOFING

PART 1 - GENERAL

1.01 Section Includes

A. Installation of standing seam metal roofing roof flashing and trim, and accessories.

1.02 Related Sections

A. Section 07 92 00 - Joint Sealers

B. Section 06 13 26 - Heavy Timber Construction

1.03 References

A. ASTM A792 - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coatedby the Hot-Dip Process.

B. UL 580 - Standard Tests for Uplift Resistance of Roof Assemblies.

1.04 Submittals

A. Manufacturer's product data including materials, thickness, dimensions, finish, accessories, and installation instructions.

B. Shop drawings showing roofing layout and details.

1.05 Delivery, Storage, and Handling

A. Handle and store material in such a way as to prevent damage. Remove damaged material from site.

PART 2 – PRODUCTS

2.01 Roof Panels

A. Sheet Steel Stock: ASTM A792, aluminum-zinc alloy Coating Designation AZ55, Grade50.

B. Roof Panels: Concealed fastener roof panel.
   1. Profile: Trapezoidal height of 3"±. McElroy Metal MasterLok 90 or equal.2. Width: 24"±.
   2. Thickness: 24 gauge.
   3. Wind Uplift Resistance: UL 580, Class 90.

C. Color: Approved by Owner.

2.02 Accessories

A. Ridge Cap: Manufacturer's standard.

B. Trim and Flashing: Manufacturer’s standard.

C. Fasteners: Manufacturer's standard type, finish to match adjacent surfaces. Size to maintain load and weather tightness requirements.

D. Closure Strips: Manufacturer’s standard.

E. Drip Edge: Galvanized steel, minimum 0.024 in. thick.

2.03 Sealants:

A. Sealants for side laps, end laps, accessories, etc. shall be a preformed, butyl rubber based compound. The material shall be non-hardening, non-shrinking and non- corrosive and shall have excellent adhesion to metals, painted surfaces and plastics attemperatures from -30°F to 160°F. These sealants shall be in tape mastic form, of shape and size recommended by metal building manufacturer for various applications and shall have paper backing for easy handling.

B. Tube sealants shall be used to supplement tape mastic sealants and shall be applied in locations indicated by erection instructions. Tube sealant shall be a synthetic, elastomer-based material which becomes tack-free in less than 2 hours at 75°F but retains flexibility.

PART 3 – EXECUTION

3.01 Preparation

A. Remove debris from roof surface.

3.02 Roof Panel Installation

A. Install roofing systems in accordance with manufacturer's instructions and details.

B. Install drip edge.

C. Install full length panels. End laps will not be allowed.

D. Fasten cladding system to roof purlins, using fasteners approved by the panel manufacturer. Fasteners shall be provided by Contractor, aligned, level, and plumb.

E. Provide and install roof eave and rake flashing per Owner provided shop drawings.

F. Install sealant and gaskets to prevent weather penetration.

G. Install closure strips.

3.03 Cleaning

A. Remove strippable coating from panels and trim.

B. Dry wipe panels as they are installed.

3.04 Protection

A. Protect installed products from subsequent construction activities.

B. Replace damaged products.

C. Repair minor finish scratches in accordance with the panel manufacturer's recommendations. Replace panels that cannot be repaired to Owner's satisfaction.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.01 Summary

A. Provide sealant and backup materials:
1. Architectural precast concrete joints.
2. Interior joints in vertical surfaces and horizontal on-traffic surfaces.
3. Acoustical sealants.
4. Aluminum, Glazing and Sheet Metal Joint Sealant.
5. Compression Seals
5. Primer

1.02 References

A. ASTM C834 - Standard Specification for Latex Sealants.

B. ASTM C919 – Use of Sealants in Acoustical Applications.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.

D. ASTM 1193 – Standard Guide for Use of Sealants

E. Sealant, Waterproofing, and Restoration Institute (SWRI)

1.03 Submittals

A. Submit color charts for selection of sealants for exposed areas.

B. Submit manufacturer's product specifications and installation instructions.

1.04 System Description

A. Performance Requirements: Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Environmental Requirements: Avoid indoor use of sealants that may contribute to indoor air quality problems, including the following:
1. Butyl rubber.
2. Solvent-based acrylic
3. Neoprene.
4. Styrene butadiene rubber.
5. Nitrile.
6. Methylene chloride or chlorinated hydrocarbons.
7. Products containing bactericides and fungicides classified as phenol mercury acetates, phenol phenates, or phenol formaldehyde.
8. Provide acrylic latex or silicone sealants with less than 50g/1 VOCs.
9. Provide polyurethane products with less than 200 g/1VOCs.

1.05 Qualifications

A. Installer's Qualifications: Installer shall have successfully completed within the last three years at least three joint sealant applications of similar size and type to this project.

1.06 Warranty

A. Provide manufacturer's 5-year standard material warranty.
B. Include coverage for replacement of sealant materials which fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

1.07 Environmental Requirements

A. Environmental Requirements:
1. Do not proceed with installation of joint sealant under the following conditions:
   a. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
   b. When joint substrates are wet due to rain, frost, condensation or other causes.
2. Remove contaminants from joint substrate capable of interfering with adhesion.
3. Joint Width Conditions: Do not proceed with installation of joint sealant when joint widths exceed limits allowed by joint sealant manufacturer for application indicated.

PART 2 - PRODUCTS

2.00 Manufacturer

A. Joint Sealant:
1. Standard of Quality: Design is based on products of Tremco, Beachwood, OH www.tremcosealants.com, unless noted otherwise.
2. Otherwise Acceptable Manufacturers: Subject to compliance with requirements, acceptable manufacturers and products are:
   a. Sonneborn by BASF, www.basfbuildingsytems.com.
   b. EUCO (Euclid Chemical), www.euclidchemical.com.
   c. USG Sheetrock Brand, www.usg.com.
   c. Manufacturer of comparable products submitted for compliance with specifications:
      i. VOC content may be cause for rejection of comparable products submitted.

B. Compression Seals:
1. Standard of Quality: Design is based on *Illmod 600* as manufactured by Tremco, Beachwood OH.
2. Manufacturer of comparable products submitted for compliance with specifications.

C. Backer Rod/Backup Filler Materials:
1. Acceptable Manufacturers; subject to compliance with requirements, acceptable manufacturers and products are:
   a. Interior Joints: Open-cell, Denverfoam by Backer Rod Manufacturing and Supply www.bayindustries.com/backerrod.

2.01 Materials

A. Interior Vertical or Horizontal Joint Sealant:
1. Interior Dry Areas: Fast-setting, acrylic Latex; ASTM C834, Type P, Grade NF.
   a. Product: *Tremflex 834*,by Tremco.
   b. Maximum VOC content: 42 grams per liter.

2. Interior Wet Areas (restroms, kitchen): 1-part mildew-resistant silicone rubber conforming to ASTM C920, Type S, Grade NS.
   a. Product: *Tremsil 200* by Tremco.
      i. Type S. Grade NS
      ii. Fungicide additive

B. Interior Floor Joint Sealant:
1. Fast-setting, semi-rigid, two-part polyurea joint filler.
2. Color: Standard colors matching finished surfaces.
3. Application: Control, construction, and expansion joints in floors.
4. Product: EUCO *QWIKjoint 200* as manufactured by Euco.

C. Acoustical Sealant:
1. Non-hardening, non-drying, non-bleeding synthetic rubber; ASTM C834.
2. Product: *Acoustical Sealant* by Tremco or equal.

D. Louvers, Windows, Doors and Frame Sealant:
1. Dymonic 100 by Tremco or equal.

E. Sheet Metal, and Glazing Joint Sealants:
   1. Silyl-terminated Polyether Sealant:
      a. Low-modulus, high-movement, non-sag, fast-curing.
      b. ASTM C920.
      c. Type and Grade: S(single component) and NS (non-sag).
      d. Class: 100/50 for vertical joints.
      e. Product:
         i. *Sonolastic 150 with VLM Technology* by BASF.
         ii. *Great Seal PE-150* by STS Coatings.

F. Smoke Sound Sealant for use in fire-rated partitions, smoke barriers, and through-penetration firestop systems:
   1. Product: *Firecode Smoke-Sound Sealant* as manufactured by USG Sheetrock.
   2. ASTM C834
   3. Acrylic, latex-based fire caulk
   4. Grade: 0 degree F, low temperature flexibility.
   5. Flame Spread: 0
   6. NOTE: 1) This product is not approved for moist locations where frost or condensation is present or in direct contact with water. 2) Product is not intedend for use with CPVC or PVC. Specifier to make alternate product selection.

2.02 Accessories

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from field tests.

B. Cleaners for non-porous surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion o sealants to joint substrates..

C. Compression Seals:
   1. Uses: Between top of concrete masonry wall and precast plank where camber in plan creates top space.

D. Joint Backing:
   1. ASTM D1667.
   2. Round, closed cell PVC foam rod; oversized 30 to 50 percent larger than joint width.
   3. Non-oily, non-staining, non-gassing, back-up filler or other filler completely compatible with sealant approved by sealant manufacturer.

E. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer.

PART 3 - EXECUTION

3.01 Examination

A. Verify that substrate surfaces and joint openings are ready to receive work. Allow concrete and mortar to cure 28 days prior to sealant installation.

B. Verify that joint backing and release tapes are compatible with sealant.

3.02 Preparation

A. Clean and prime joints. Do not allow primer to get outside of joints.
   1. Prime and seal on the same day.

B. Remove loose materials, dust, moisture, form release agents, waterproofings, and other foreign matter that might impair adhesion of sealant.

C. Protect elements surrounding the work of this section from damage or disfiguration.

3.03 Installation

A. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

B. Install Sealants using proven techniques that comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
   4. Install joint sealant to all joints except those that allow moisture to drain.
   5. Caulk wide joints with three passes.
   6. Run a bead at each inside corner, fill joint with third pass.
   7. Tool joints immediately after application of material to ensure full contact with adjacent surfaces.
   8. Strike off excess material. Finished bead is to be flush with adjoining surfaces, unless otherwise indicated on Drawings.

C. Measure joint dimensions and size backing material to achieve required depth/width ratio.

D. Install bond breaker where joint backing is not used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

3.04 Curing

A. Allow minimum 7 days for full cure.

B. Do adhesion testing after 7 days.

C. Painting Sealant:
   1. Allow 7 days to cure before applying paint.
   2. Match sealant to paint colors.

3.05 Protection

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion.

END OF SECTION

SECTION 26 05 00

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

A. The electrical work included in all other divisions is the responsibility of the contractor performing the Division 26 work unless noted otherwise. The Contractor shall refer to other Divisions, and other Consultant's Drawings and Specifications, for additional work to be performed under Division 26. These include, but are not limited to: Civil, Architectural, Structural, etc.

1.01 Project Overview

A. Work as described in these specifications, and the attached drawings. All labor and materials necessary to complete Electrical work as specified herein, and as illustrated on the Drawings.

1.02 Scope

A. The work under this section includes basic electrical requirements, which are applicable to all Division 26 sections. This section includes information common to two or more technical specification sections or items that are of a general nature, not conveniently fitting into other technical sections. Included are the following topics:

1.03 Reference Standards

A. Abbreviations of standards organizations referenced in this and other sections are as follows:

ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
EPA	Environmental Protection Agency
ETL	Electrical Testing Laboratories, Inc.
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
ISA	Instrument Society of America
NBS	National Bureau of Standards
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
UL	Underwriters Laboratories Inc.

1.04 Regulatory Requirements

A. All work and materials are to conform in every detail to applicable rules and requirements of the Wisconsin State Electrical Code Volumes 1 and 2, the National Electrical Code (ANSI/NFPA 70), other applicable National Fire Protection Association codes, the National Electrical Safety Code, and present manufacturing standards (including NEMA).

B. All Division 26 work shall be done under the direction of a currently certified State of Wisconsin Certified Master Electrician.

1.05 Quality Assurance

A. Where equipment or accessories are used which differ in arrangement, configuration, dimensions, ratings, or engineering parameters from those indicated on the contract documents, the contractor is responsible for all costs involved in integrating the equipment or accessories into the system and the assigned space and for obtaining the performance from the system into which these items are placed.

B. Manufacturer references used herein are intended to establish a level of quality and performance requirements unless more explicit restrictions are stated to apply.

C. All materials, except medium voltage equipment and components, shall be listed by and shall bear the label of an approved electrical testing laboratory. If none of the approved electrical testing laboratories has published standards for a particular item, then other national independent testing standards, if available, applicable, and approved by A/E, shall apply and such items shall bear those labels. Where one of the approved electrical testing laboratories has an applicable system listing and label, the entire system, except for medium voltage equipment and components, shall be so labeled.

1.06 Protection of Finished Surfaces

A. Furnish one can of touch-up paint for each different color factory finish furnished by the Contractor. Deliver touch-up paint with other "loose and detachable parts" as covered in the General Requirements.

1.07 Approved Electrical Testing Laboratories

A. The following laboratories are approved for providing electrical product safety testing and listing services as required in these specifications:
Underwriters Laboratories Inc.
Electrical Testing Laboratories, Inc.

1.08 Sleeves and Openings

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

1.09 Sealing and Firestopping

A. Sealing and firestopping of sleeves/openings between conduits, wireways, troughs, etc. and the structural or partition opening shall be the responsibility of the contractor whose work penetrates the opening. The contractor responsible shall hire individuals skilled in such work to do the sealing and firestopping. These individuals hired shall normally and routinely be employed in the sealing and fireproofing occupation.

1.10 Work by Owner

A. Systems not described in these contract documents will be by the Owner under separate contract.

1.11 Intent

A. The Contractor shall furnish and install all the necessary materials, apparatus, and devices to complete the electrical equipment and systems installation herein specified, except such parts as are specifically exempted herein.

B. If an item is either called for in the specifications or shown on the plans, it shall be considered sufficient for the inclusion of said item in this contract. If a conflict exists within the Specifications or exists within the Drawings, the Contractor shall furnish the item, system, or workmanship, which is the highest quality, largest, or most closely fits the A/E's intent (as determined by the A/E Project Manager). Refer to the General Conditions of the Contract for further clarification.

C. It must be understood that the details and drawings are diagrammatic. The Contractor shall verify all dimensions at the site and be responsible for their accuracy.

D. All sizes as given are minimum except as noted.

E. Materials and labor shall be new (unless noted or stated otherwise), first class, and workmanlike, and shall be subject at all times to the A/E's inspections, tests and approval from the commencement until the acceptance of the completed work.

F. Whenever a particular manufacturer's product is named, it is intended to establish a level of quality and performance requirements unless more explicit restrictions are stated to apply.

1.12 Omissions

A. No later than ten (10) days before bid opening, the Contractor shall call the attention of the A/E to any materials or apparatus the Contractor believes to be inadequate and to any necessary items of work omitted.

1.13 Submittals

A. Submit for all equipment and systems as indicated in the respective specification sections, marking each submittal with that specification section number. Mark general catalog sheets and drawings to indicate specific items being submitted and proper identification of equipment by name and/or number, as indicated in the contract documents. Failure to do this may result in the submittal(s) being returned to the Contractor for correction and resubmission. Failing to follow these instructions does not relieve the Contractor from the requirement of meeting the project schedule.

B. On request from the A/E, the successful bidder shall furnish additional drawings, illustrations, catalog data, performance characteristics, etc.

C. Submittals shall be grouped to include complete submittals of related systems, products, and accessories in a single submittal. Mark dimensions and values in units to match those specified. Include wiring diagrams of electrically powered equipment.

D. The submittals must be approved before fabrication is authorized.

E. Submit sufficient quantities of submittals to allow the following distribution:

Operating and Maintenance Manuals	2 copies
Owner	1 copy
A/E	2 copies
Field Office	1 copy

1.14 Project/Site Conditions

A. Install Work in locations shown on Drawings, unless prevented by Project conditions.

B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of A/E before proceeding.

C. Tools, materials and equipment shall be confined to areas designated by the Owner.

1.15 Work Sequence and Scheduling

A. Install work in phases to accommodate Owner's occupancy requirements. During the construction period coordinate electrical schedule and operations with A/E's Construction Representatives.

1.16 Work by Other Trades

A. Every attempt has been made to indicate in this trade's specifications and drawings all work required of this Contractor. However, there may be additional specific paragraphs in other trade specifications and addenda, and additional notes on drawings for other trades which pertain to this Trade's work, and thus those additional requirements are hereby made a part of these specifications and drawings.

B. Electrical details on drawings for equipment to be provided by others is based on preliminary design data only. This Contractor shall lay out the electrical work and shall be responsible for its correctness to match equipment actually provided by others.

1.17 Offsite Storage

A. If payment will be requested for approved offsite stored material, then the Contractor shall complete an "Off-site Storage Agreement" which is available from the A/E. Prior approval by A/E personnel for offsite storage will be needed. No material will be accepted for offsite storage unless submittals for the material have been approved.

1.18 Request and Certificate for Payment

A. Within 10 days after Notice to Proceed, the successful bidder will submit to the A/E in a form prescribed below and by the General Conditions of the Contract, Scheduling and Coordination of Work, Reports, Records and Data, and Payments to Contractor, a cost breakdown of the proposed values for work performed which, if approved by the A/E, will become the basis for construction progress and monthly payments. The cost breakdown items shall reflect actual work progress stages as closely as feasible.

B. In addition, if payment will be requested for approved off-site stored material, then that material shall be listed as a line item and the Contractor shall complete an "Off-site Storage Agreement" which is available from the A/E.

1.19 Certificates and Inspections

A. Obtain and pay for all required State and/or Municipal installation inspections. Deliver originals of inspection reports to the Owner's Project Representative.

1.20 Operation and Maintenance Data

A. All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

B. In addition to the general content specified under GENERAL REQUIREMENTS supply the following additional documentation:

1. Manufacturer’s wiring diagrams for electrically powered equipment.

1.20 Record Drawings

A. The Contractor shall maintain at least one copy each of the specifications and drawings on the job site at all times.

B. The A/E will provide the Contractor with a suitable set of contract drawings on which daily records of changes and deviations from contract shall be recorded. Dimensions and elevations on the record drawings shall locate all buried or concealed piping, conduit, or similar items.

C. The daily record of changes shall be the responsibility of Contractor's field superintendent. No arbitrary mark-ups will be permitted.

D. At completion of the project, the Contractor shall submit the marked-up record drawings to the A/E prior to final payment.

PART 2 - PRODUCTS

2.01 Identification

A. See Electrical section 26 05 53 – Identification for Electrical Systems.

2.02 Sealing and Firestopping

A. FIRE AND/OR SMOKE RATED PENETRATIONS:

B. Manufacturers:
3M, STI/SpecSeal, Tremco, Hilti or approved equal.

C. All firestopping systems shall be by the same manufacturer.

D. Submittals:
Contractor shall submit product data for each firestop system. Submittals shall include product characteristics, performance and limitation criteria, test data, MSDS sheets, installation details and procedures for each method of installation applicable to this project. For non-standard conditions where no UL tested system exists, submit manufacturer's drawings for UL system with known performance for which an engineering judgement can be based upon.

E. Product:
Firestop systems shall be UL listed or tested by an independent testing laboratory approved by the Department of Commerce.

F. Use a product that has a rating not less than the rating of the wall or floor being penetrated. Reference architectural drawings for identification of fire and/or smoke rated walls and floors.

G. Contractor shall use firestop putty, caulk sealant, intumescent wrapstrips, intumescent firestop collars, firestop mortar or a combination of these products to provide a UL listed system for each application required for this project. Provide mineral wool backing where specified in manufacturer's application detail.

H. NON-RATED PENETRATIONS:

Conduit Penetrations Through Below Grade Walls:
In exterior wall openings below grade, use a modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the uninsulated conduit and the cored opening or a water-stop type wall sleeve.

I. Conduit Penetrations:
At conduit penetrations of non-rated interior partitions, floors and exterior walls above grade, use urethane caulk in annular space between conduit and sleeve, or the core drilled opening.

PART 3 - EXECUTION

3.01 Excavation and Backfill

A. Perform all excavation and backfill work to accomplish indicated electrical systems installation in accordance with section 31 23 16.13 - Trenching. Blasting will not be allowed without written permission of the Owner and A/E.

3.02 Concrete Work

A. The Division 3 Contractor will perform all cast-in-place concrete unless noted otherwise elsewhere. Provide all layout drawings, anchor bolts, metal shapes, and/or templates required to be cast into concrete or used to form concrete for the support of electrical equipment.

3.03 Cutting and Patching

A. Refer to Division 1, General Requirements, Cutting and Patching.

3.04 Building Access

A. Arrange for the necessary openings in the building to allow for admittance of all apparatus. When the building access was not previously arranged and must be provided by this contractor, restore any opening to its original condition after the apparatus has been brought into the building.

3.05 Equipment Access

A. Install all piping, conduit, ductwork, and accessories to permit access to equipment for maintenance. Coordinate the exact location of wall and ceiling access panels and doors with the General Contractor, making sure that access is available for all equipment and specialties. Where access is required in plaster or drywall walls or ceilings, furnish the access doors to the General Contractor and reimburse the General Contractor for installation of those access doors.

3.06 Coordination

A. The Contractor shall cooperate with other trades and Owner's personnel in locating work in a proper manner. Should it be necessary to raise or lower or move longitudinally any part of the electrical work to better fit the general installation, such work shall be done at no extra cost to the Owner, provided such decision is reached prior to actual installation. The Contractor shall check location of electrical outlets with respect to other installations before installing.

B. The Contractor shall verify that all devices are compatible for the surfaces on which they will be used. This includes, but is not limited to light fixtures, panelboards, devices, etc. and recessed or semi-recessed heating units installed in/on architectural surfaces.

C. Coordinate all work with other contractors prior to installation. Any installed work that is not coordinated and that interferes with other contractor's work shall be removed or relocated at the installing contractor's expense.

3.07 Sleeves

A. Pipe sleeves for conduits 6" in diameter and smaller, in new poured concrete construction, shall be schedule 40 steel pipe, plastic removable sleeve or sheet metal sleeve, all cast in place.

3.08 Sealing

A. When the opening is through a non-fire rated wall, floor, ceiling or roof the opening must be sealed using an approved type of material.

B. Install escutcheons or floor/ceiling plates where conduit, penetrates non-fire rated surfaces in occupied spaces. Occupied spaces for this paragraph include only those rooms with finished ceilings and the penetration occurs below the ceiling.

3.09 Housekeeping and Clean Up

A. The Contractor shall clean up and remove from the premises, on a daily basis, all debris and rubbish resulting from its work and shall repair all damage to new and existing equipment resulting from its work. When job is complete, this Contractor shall remove all tools, excess material and equipment, etc., from the site.

3.10 Owner Training

A. Contractor to provide factory authorized representative and/or field personnel knowledgeable with the operations, maintenance and troubleshooting of the system and/or components defined within this section for a minimum period of 2 hours.

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLE

PART 1 - GENERAL

1.01 Scope

A. The work under this section includes furnishing and installing required wiring and cabling systems including pulling, terminating and splicing.

1.02 References

A. NFPA 70 - National Electrical Code.

1.03 Submittals

A. Submit product data: Provide for each cable assembly type.

B. Submit factory test reports: Indicate procedures and values obtained.

C. Submit shop drawings for modular wiring system including layout of distribution devices, branch circuit conduit and cables, circuiting arrangement, and outlet devices.

D. Submit manufacturer's installation instructions. Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

1.04 Project Conditions

A. Verify that field measurements are as shown on Drawings.

B. Conductor sizes are based on copper.

C. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required to meet project conditions.

D. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.

PART 2 - PRODUCTS

2.01 General

A. All wire shall be new, delivered to the site in unbroken cartons and shall be less than one year old out of manufacturer's stock.

B. All conductors shall be copper.

C. Insulation shall have a 600 volt rating.

D. All conductors shall be stranded.

Stranded conductors may only be terminated with UL OR ETL Listed type terminations or methods: e.g. stranded conductors may not be wrapped around a terminal screw but must be terminated with a crimp type device or must be terminated in an approved back wired method.

2.02 Building Wire

A. Description: Single conductor insulated wire.

B. Insulation: Type THHN/THWN, XHHW-2 insulation for feeders and branch circuits.

2.03 Underground Wire for Exterior Work

A. Description: Stranded single or multiple conductor insulated wire.

B. Insulation: Type XHHW-2 or USE.

C. This wiring shall be used in all underground applications, except when run in a concrete-encased ductbank.

2.04 Wiring Connectors

A. Split Bolt Connectors: Not acceptable.

B. Solderless Pressure Connectors: High copper alloy terminal. May be used only for cable termination to equipment pads or terminals. Not approved for splicing.

C. Spring Wire Connectors: Solderless spring type pressure connector with insulating covers for copper wire splices and taps. Use for conductor sizes 10 AWG and smaller.

D. All wire connectors used in underground or exterior pull boxes shall be gel filled twist connectors or a connector designed for damp and wet locations.

E. Mechanical Connectors: Bolted type tin-plated; high conductivity copper alloy; spacer between conductors; beveled cable entrances.

F. Compression (crimp) Connectors: Long barrel; seamless, tin-plated electrolytic copper tubing; internally beveled barrel ends. Connector shall be clearly marked with the wire size and type and proper number and location of crimps.

PART 3 - EXECUTION

3.01 General Wiring Methods

A. All wire and cable shall be installed in conduit.

B. Do not use wire smaller than 12 AWG for power and lighting circuits.

C. All conductors shall be sized to prevent excessive voltage drop at rated circuit ampacity. As a minimum use 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 100 feet (30 m).

D. Make conductor lengths for parallel conductors equal.

E. Splice only in junction or outlet boxes.

F. No conductor less than 10 AWG shall be installed in exterior underground conduit.

G. Identify ALL low voltage, 600v and lower, wire per section 26 05 53.

H. Neatly train and lace wiring inside boxes, equipment, and panelboards.

3.02 Wiring Installation in Raceways

A. Pull all conductors into a raceway at the same time. Use Listed wire pulling lubricant for pulling 4 AWG and larger wires and for other conditions when necessary.

B. Install wire in raceway after interior of building has been physically protected from the weather and all mechanical work likely to injure conductors has been completed.

C. Completely and thoroughly swab raceway system before installing conductors.

D. Place all conductors of a given circuit (this includes phase wires, neutral (if any), and ground conductor) in the same raceway. If parallel phase and/or neutral wires are used, then place an equal number of phase and neutral conductors in same raceway or cable.

3.03 Wiring Connections and Terminations

A. Splice only in accessible junction boxes.

B. Wire splices and taps shall be made firm, and adequate to carry the full current rating of the respective wire without soldering and without perceptible temperature rise.

C. All splices shall be so made that they have an electrical resistance not in excess of two feet (600 mm) of the conductor.

D. Use solderless spring type pressure connectors with insulating covers for wire splices and taps, 10 AWG and smaller.

E. Use mechanical or compression connectors for wire splices and taps, 8 AWG and larger. Tape uninsulated conductors and connectors with electrical tape to 150 percent of the insulation value of conductor.

F. Thoroughly clean wires before installing lugs and connectors.

G. At all splices and terminations, leave tails long enough to cut splice out and completely re-splice.

3.04 Field Quality Control

A. Field inspection and testing will be performed under provisions of Section 26 05 04.

3.05 Wire Color

A. General:
Solid colored insulation is required for all THHN/THWN-2 wire. For other wire types use colored wire or identify wire with colored tape at all terminals, splices and boxes. Wire shall be colored as indicated below.

B. In existing facilities, use existing color scheme.

C. In new facilities, use black and red for single phase circuits at 120/240 volts, use Phase A black, Phase B red, and Phase C blue, for circuits at 120/208 volts single or three phase, and use Phase A brown, Phase B orange, and Phase C yellow, for circuits at 277/480 volts single or three phase. Note: This includes fixture whips except for Listed whips mounted by the fixture manufacturer on the fixture and Listed as a System.

D. Switch legs shall be the same color as their associated circuit, except for the second switch leg used for dual-level switching. The second switch leg shall be the next phase color, e.g. if the first switch leg is brown (277/480V phase A), the second switch leg shall be orange (277/480V phase B).

Traveler conductors run between 3 and 4 way switches shall be colored pink or purple.

E. Neutral Conductors: White for 120/208V and 120/240V systems, Gray for 277/480V systems. Where there are two or more neutrals in one conduit, each shall be individually identified with a different stripe.

F. Branch Circuit Conductors: Three or four wire home runs shall have each phase uniquely color coded.

G. Feeder Circuit Conductors: Each phase shall be uniquely color coded.

H. Ground Conductors: Green for 6 AWG and smaller. For 4 AWG and larger, identify with green colored wire, or with green tape at both ends and at all access points, such as panelboards, disconnects and junction boxes.

3.06 Branch Circuits

A. The use of single-phase, multi-wire branch circuits with a common neutral is not permitted. All branch circuits shall be furnished and installed with an individual accompanying neutral, sized the same as the phase conductors.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 Scope

A. The work under this section includes grounding electrodes and conductors, equipment grounding conductors, and bonding.

1.02 References

A. NFPA 70 - National Electrical Code.
ANSI/IEEE 142 (Latest edition) - Recommended Practice for Grounding of Industrial and Commercial Power Systems.

1.03 Performance Requirements

A. Grounding System Resistance: 2ohms maximum at building service entrance.

Provide test report of grounding system resistance in final O&M manuals.

1.04 Submittals

A. Product Data: Provide data for grounding electrodes and connections.

B. Test Reports: Indicate overall resistance to ground and resistance of each electrode.

C. Manufacturer's Instructions: Include instructions for preparation, installation and examination of exothermic connectors.

1.05 Project Record Documents

A. Accurately record actual locations of grounding electrodes.

1.06 Regulatory Requirements

A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

PART 2 - PRODUCTS

2.01 Mechanical Connectors

A. The mechanical connector bodies shall be manufactured from high strength, high conductivity cast copper alloy material. Bolts, nuts, washers and lockwashers shall be made of Silicon Bronze and supplied as a part of the connector body and shall be of the two bolt type.

B. Split bolt connector types are NOT allowed. Exception: the use of split bolts is acceptable for grounding of wire-basket type cable tray, and for cable shields/straps of medium voltage cable.

C. The connectors shall meet or exceed UL 467 and be clearly marked with the catalog number, conductor size and manufacturer.

2.02 Compression Connectors

A. The compression connectors shall be manufactured from pure wrought copper. The conductivity of this material shall be no less than 99% by IACS standards.

B. The connectors shall meet or exceed the performance requirements of IEEE 837, latest revision.

C. The installation of the connectors shall be made with a compression, tool and die system, as recommended by the manufacturer of the connectors.

D. The connectors shall be clearly marked with the manufacturer, catalog number, conductor size and the required compression tool settings.

E. Each connector shall be factory filled with an oxide-inhibiting compound.

2.03 Wire

A. Material: Stranded copper (aluminum not permitted).

B. Grounding Electrode Conductor: Size as shown on drawings, specifications or as required by NFPA 70, whichever is larger.

C. Feeder and Branch Circuit Equipment Ground: Size as shown on drawings, specifications or as required by NFPA 70, whichever is larger. Differentiate between the normal ground and the isolated ground when both are used on the same facility.

PART 3 - EXECUTION

3.01 Examination

A. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.02 General

A. Install Products in accordance with manufacturer's instructions.

B. Mechanical connections shall be accessible for inspection and checking. No insulation shall be installed over mechanical ground connections.

C. Ground connection surfaces shall be cleaned and all connections shall be made so that it is impossible to move them.

D. Attach grounds permanently before permanent building service is energized.

E. All grounding electrode conductors shall be installed in PVC conduit, in exposed locations.

3.03 Less Than 600 Volt System Grounding

A. Provide code sized copper grounding electrode conductor from secondary switchboard ground bus, to street side of water meter. Provide bonding jumper around water meter.

B. Bond together system neutrals, service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, receptacle ground connectors, and plumbing systems.

C. Equipment Grounding Conductor: Provide separate, insulated equipment grounding conductor within each raceway. Terminate each end on suitable lug, bus, enclosure or bushing. Provide a ground wire from each device to the respective enclosure.

3.04 Field Quality Control

A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

END OF SECTION

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 Scope

A. The work under this sections includes conduit and equipment supports, straps, clamps, steel channel, etc, and fastening hardware for supporting electrical work.

1.02 Submittals

A. Product Data: Provide data for support channel.

1.03 Quality Assurance

A. Support systems shall be adequate for weight of equipment and conduit, including wiring which they carry.

PART 2 - PRODUCTS

2.01 Materials

A. Support Channel: Steel, Galvanized, Enameled or other corrosion resistant.

B. Hardware: Corrosion resistant.

C. Minimum sized threaded rod for supports shall be 3/8” for trapezes and single conduits 1-1/4” and larger, and ¼” for single conduits 1” and smaller.

D. Conduit clamps, straps, supports, etc., shall be steel or malleable iron. One-hole straps shall be heavy duty type. All straps shall have steel or malleable backing plates when rigid steel conduit is installed on the interior or exterior surface of any exterior building wall.

PART 3 - EXECUTION

3.01 Installation

A. Fasten hanger rods, conduit clamps, outlet, junction and pull boxes to building structure using pre-cast insert system, preset inserts, beam clamps, expansion anchors, or spring steel clips (interior metal stud walls only).

B. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchors on concrete surfaces; sheet metal screws in sheet metal studs and wood screws in wood construction. If nail-in anchors are used, they must be removable type anchors.

Power-actuated fasteners and plastic wall anchors are not permitted.

C. File and de-bur cut ends of support channel and spray paint with cold galvanized paint to prevent rusting.

D. Do not fasten supports to piping, ductwork, mechanical equipment, cable tray or conduit. Do not fasten to suspended ceiling grid system.

E. Do not drill structural steel members unless approved by Owner’s Structural Engineer.

F. Fabricate supports from galvanized structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.

G. Install surface-mounted cabinets and panelboards with minimum of four anchors. Provide steel channel supports to stand cabinet one inch (25 mm) off wall (7/8” Uni-strut is acceptable).

H. Furnish and install all supports as required to fasten all electrical components required for the project, including free standing supports required for those items remotely mounted from the building structure, catwalks, walkways etc.

END OF SECTION

SECTION 26 05 33

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 Scope

A. The work under this section includes conduits, and boxes for electrical systems including wall and ceiling outlet boxes, and junction boxes.

1.02 Submittals

A. Raceway, Boxes, Fittings, etc - provide product data showing configurations, finishes, dimensions, and manufacturer's instructions.

PART 2 - PRODUCTS

2.01 Rigid Metal Conduit and Fittings

A. Conduit: Heavy wall, galvanized steel, schedule 40, threaded.

B. Fittings and Conduit Bodies: Use all steel threaded fittings and conduit bodies.

2.02 Electrical Metallic Tubing (EMT) and Fittings

A. Conduit: Steel, galvanized tubing.

B. Fittings: All steel, compression, concrete tight. No set screw, push-on or indenter types permitted.

Conduit Bodies: All steel threaded conduit bodies.

2.03 Rigid Nonmettalic Conduit and Fittings

A. Conduit: Schedule 40 PVC minimum, Listed, sunlight resistant, rated for 90^0 C conductors.

B. Fittings and Conduit Bodies: NEMA TC 2, Listed.

2.04 Conduit Supports

A. See section 26 05 29.

2.05 Outlet Boxes

A. Sheet Metal Outlet Boxes: galvanized steel, with stamped knockouts.

B. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 3/8 inch male fixture studs where required.

C. Cast Boxes: Cast ferroalloy, or aluminum type deep type, gasketed cover, threaded hubs.

2.06 Pull and Junction Boxes

A. Pull boxes and junction boxes shall be minimum 4 inch square (100 mm) by 2 1/8th inches (54 mm) deep for use with 1 inch (25 mm) conduit and smaller. On conduit systems using 1 1/4 inch (31.75 mm) conduit or larger, pull and junction boxes shall be sized per NEC but not less than 4 11/16 inch square (117 mm).

B. Sheet Metal Boxes: code gauge galvanized steel, screw covers, flanged and spot welded joints and corners.

C. Sheet Metal Boxes Larger Than 12 Inches (300 mm) in any dimension shall have a hinged cover or a chain installed between box and cover.

D. Cast Metal Boxes for Outdoor and Wet Location Installations: Type 4 and Type 6, flat-flanged, surface-mounted junction box, UL listed as raintight. Galvanized cast iron or aluminum box and cover with ground flange, neoprene gasket, and stainless steel cover screws.

E. Box extensions and adjacent boxes within 48” of each other are not allowed for the purpose of creating more wire capacity.

F. Junction boxes 6" x 6" or larger size shall be without stamped knock-outs.

G. Wireways shall not be used in lieu of junction boxes.

2.07 General

A. All steel fittings and conduit bodies shall be galvanized.

B. No cast metal, or split-gland type fittings permitted.

C. Mogul-type condulets larger than 2 inch (50 mm) not permitted except as approved or detailed.

D. All condulet covers must be fastened to the condulet body with screws and be of the same manufacture.

E. Wireways, gutters and c-condulets shall not be used in lieu of pull boxes and condulets.

F. All boxes shall be of sufficient size to provide free space for all conductors enclosed in the box and shall comply with NEC requirements.

PART 3 - EXECUTION

3.01 Conduit Sizing, Arrangement, and Support

A. EMT is permitted to be used in sizes 4" (50 mm) and smaller for power systems. See CONDUIT INSTALLATION SCHEDULE below for other limitations for EMT and other types of conduit.

B. Size power conductor raceways for conductor type installed. Conduit size shall be 1/2 inch (13 mm) minimum except **all homerun conduits shall be ¾”,** or as specified elsewhere. **Caution: Per the NEC, the allowable conductor ampacity is reduced when more than three current-carrying conductors are installed in a raceway. Contractor must take the NEC ampacity adjustment factors into account when sizing the raceway and wiring system.**

C. Arrange conduit to maintain headroom and present a neat appearance.

D. Route exposed conduit parallel and perpendicular to walls and structure.

E. Arrange conduit supports to prevent distortion of alignment by wire pulling operations. Fasten conduit using galvanized pipe straps, conduit racks (lay-in adjustable hangers), clevis hangers, or bolted split stamped galvanized hangers.

F. Group conduit in parallel runs where practical.

G. Do not fasten conduit with wire or perforated pipe straps. Before conductors are pulled, remove all wire used for temporary conduit support during construction.

H. Support and fasten metal conduit at a maximum of 8 feet (2.4 m) on center.

I. In general, all conduit shall be concealed except where noted on the drawings or approved by the Architect/Engineer. Contractor shall verify with Architect/Engineer all surface conduit installations.

J. Changes in direction shall be made with symmetrical bends, cast steel boxes, stamped metal boxes or cast steel conduit bodies.

K. No continuous conduit run shall exceed 100 feet (30 meters) without a junction box.

L. All conduits installed in exposed areas shall be installed with a box offset before entering box.

3.03 Conduit Installation

A. Cut conduit square; de-burr cut ends.

B. Conduit shall not be fastened to the corrugated metal roof deck.

C. Bring conduit to the shoulder of fittings and couplings and fasten securely.

D. Use conduit hubs for fastening conduit to cast boxes. Use sealing locknuts or conduit hubs for fastening conduit to sheet metal boxes in damp or wet locations.

E. All conduit terminations (except for terminations into conduit bodies) shall use conduit hubs, or connectors with one locknut, or shall use double locknuts (one each side of box wall) and insulated bushing. Provide bushings for the ends of all conduit not terminated in box walls. Refer to Section 26 05 26 – Grounding and Bonding for Electrical Systems for grounding bushing requirements.

F. Install no more than the equivalent of three 90 degree bends between boxes.

G. Use hydraulic one-shot conduit bender or factory elbows for bends in conduit larger than 2 inch (50 mm) size unless sweep elbows are required.

H. Conduit shall be bent according to manufacturers recommendations. Torches or open flame shall not be used to aid in bend of PVC conduit.

I. Use suitable conduit caps or other approved seals to protect installed conduit against entrance of dirt and moisture.

J. Provide 1/8 inch (3 mm) nylon pull string in empty conduit, except sleeves and nipples.

K. Install expansion-deflection joints where conduit crosses building expansion joints. Note: expansion-deflection joints are not required where conduit crosses building control joints if the control joint does not act as an expansion joint. Install expansion fitting in PVC conduit runs as recommended by the manufacturer.

L. Avoid moisture traps where possible. Where moisture traps are unavoidable, provide junction boxes with drain fittings at conduit low points.

M. Conduit is not permitted in any slab topping of two inches (50 mm) or less.

N. Ground and bond conduit under provisions of Section 26 05 26.

O. PVC conduit shall transition to galvanized rigid metal conduit before it enters a concrete foundation, wall (where exposed) or up through a concrete slab, unless noted otherwise.

P. Identify conduit under provisions of Section 26 05 53.

Q. All conduit installed underground (exterior to building) shall be buried a minimum of 24” below finished grade, whether or not the conduit is concrete encased.

R. PVC conduit shall be cleaned with solvent, and dried before application of glue. The temperature rating of glue/cement shall match weather condition. Apply full even coat of

cement/glue to entire area that will be inserted into fitting. The entire installation shall meet manufacturers recommendations.

3.04 Conduit Installation Schedule

A. Conduit other than that specified below for specific applications shall not be used.

B. Underground Installations Within Five Feet (1.5 m) of Foundation Wall: Rigid steel conduit.

C. Underground Installations More than Five Feet (1.5 m) From Foundation Wall: Rigid steel conduit. Schedule 40 PVC conduit.

D. Under Slab on Grade Installations: Schedule 40 PVC conduit.

E. Exposed Outdoor Locations: Rigid steel conduit.

F. Concealed in Concrete and Block Walls: Rigid steel conduit. Electrical metallic tubing. Schedule 40 PVC conduit.

G. Wet Interior Locations: Rigid steel conduit.

H. Exposed Damp Interior Locations: Rigid steel conduit. Electrical metallic tubing.

I. Light fixtures: Direct box or conduit connection for surface mounted fixtures.

3.05 Coordination of Box Locations

A. Provide electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and code compliance.

B. Electrical box locations shown on Contract Drawings are approximate unless dimensioned. Verify location of floor boxes and outlets in offices and work areas prior to rough-in.

C. No outlet, junction, or pull boxes shall be located where it will be obstructed by other equipment.

D. Boxes shall not be fastened to the metal roof deck.

E. It shall be the Contractor's responsibility to study drawings pertaining to other trades, to discuss location of outlets with workmen installing other piping and equipment and to fit all electrical outlets to job conditions.

F. In case of any question or argument over the location of an outlet, the Contractor shall refer the matter to the Architect/Engineer and install outlet as instructed by the Architect/Engineer.

G. The proper location of each outlet is considered a part of this contract and no additional compensation will be paid to the Contractor for moving outlets which were improperly located.

H. Locate and install boxes to allow access to them. Where installation is inaccessible, coordinate locations and provide 18 inch (450 mm) by 24 inch (600 mm) access doors.

I. Locate and install to maintain headroom and to present a neat appearance.

3.06 Outlet Box Installation

A. Power:
Recessed (1/4” maximum) outlet boxes in masonry, concrete or tile construction shall be minimum 4 inch square, with device rings. Device covers shall be square-cut except rounded corner plaster rings are allowed in drywall applications. Angle cut plaster rings are not permitted. Coordinate masonry cutting to achieve neat openings for boxes.

B. Provide knockout closures for unused openings.

C. Support boxes independently of conduit except for cast boxes that are connected to two rigid metal conduits, both supported within 12 inches (300 mm) of box.

D. Use multiple-gang boxes where more than one device are mounted together; do not use sectional boxes.

E. Coordinate mounting heights and locations of outlets.

F. Ceiling outlets shall be 4 inch square, minimum 2-1/8 inch (54 mm) deep except that concrete boxes and plates will be approved where applicable.

G. Provide recessed outlet boxes in finished areas; secure boxes to interior wall, accurately positioning to allow for surface finish thickness.

H. Provide cast ferroalloy or aluminum outlet boxes in exterior and wet locations.

I. Surface wall outlets shall be 4 inch (100 mm) square with raised covers for one and two gang requirements. For three gang or larger requirements, use gang boxes with non-overlapping covers.

3.07 Pull and Junction Box Installation

A. Support pull and junction boxes independent of conduit.

END OF SECTION

SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 Scope

A. The work under this section includes the products and execution requirements relating to labeling of power, lighting, general wiring. Further, this section includes labeling of all terminations and related sub-systems, including but not limited to nameplates, and stenciling.

1.02 Submittals

A. Include schedule for nameplates and stenciling.

B. Prior to installation, the Contractor shall provide samples of all label types planned for the project. These samples shall include examples of the lettering to be used. Samples shall be mounted on 8 1/2” x 11” sheets annotated, explaining their purposed use.

PART 2 - PRODUCTS

2.01 Materials

A. Labels: All labels shall be permanent, and machine generated. NO HANDWRITTEN OR NON-PERMANENT LABELS ARE ALLOWED. Exception: back side of device plates and junction boxes may use handwritten, legible labeling on box covers, unless specifically prohibited by other specification sections.

B. Cable label size shall be appropriate for the conductor or cable size(s), outlet faceplate layout and patch panel design. All labels shall be self-laminating, white/transparent vinyl and be wrapped around the cable or sheath. Labels for power conductors (600V and lower) shall be cloth-type. Flag type labels are not allowed. The labels shall be of adequate size to accommodate the circumference of the cable being labeled and properly self-laminate over the full extent of the printed area of the label.

C. Nameplates: Engraved three-layer laminated plastic, black letters on a white background.

D. Tape (phase identification only): Scotch #35 tape in appropriate colors for system voltage and phase.

E. Adhesive type labels not permitted except for phase and wire identification. Machine generated adhesive labels shall be permitted for device plates, 4-11/16” and smaller junction boxes, Fire alarm and control devices.

PART 3 - EXECUTION

3.01 General

A. All branch circuit and power panels must be identified with the same symbol used in circuit directory in main distribution center.

B. Clean all surfaces before attaching labels with the label manufacturer’s recommended cleaning agent.

C. Install all labels firmly as recommended by the label manufacturer.

D. Labels shall be installed plumb and neatly on all equipment.

E. Install nameplates parallel to equipment lines.

F. Secure nameplates to equipment fronts using screws, rivets or manufacturer approved adhesive or cement.

G. Embossed tape will not be permitted for any application.

3.02 Junction and Pullbox Identification

A. The following junction and pullboxes shall be identified utilizing spray painted covers:

System	Color(s)
Secondary Power – 277/480V	Brown
Secondary Power – 208Y/120V, 240/120V	White

B. Provide circuit numbers, and source panel designations for power wiring. Other system shall be identified as shown on details or approved shop drawings. Temperature control shall identify the source.

3.03 Power and Control Wire Identification

A. Provide wire markers on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connection. Identify with branch circuit or feeder number for power and lighting circuits, and with control wire number as indicated on schematic and interconnection diagrams or equipment manufacturer's shop drawings for control wiring.

B. All wiring shall be labeled within 2 to 4 inches of terminations. Each end of a wire or cable shall be labeled as soon as it is terminated including wiring used for temporary purposes.

3.04 Wiring Device Identification

A. Wall switches, receptacles, device plates, box covers, and photocells shall be identified with circuit numbers and source. Use machine-generated labels, or neatly hand-written permanent marker.

3.05 Nameplate Engraving

A. Provide nameplates of minimum letter height as scheduled below.

B. Panelboards: 1 inch (25 mm); identify equipment designation. 1/2 inch (13 mm); identify voltage rating, source and room location of the source.

C. Equipment Enclosures: 1 inch (25 mm); identify equipment designation.

D. Junction boxes: 1 inch (25 mm); identify system source(s) and load(s) served. Junction boxes may be neatly identified using a permanent marker.

3.06 Panelboard Directories

A. Typed directories for panels must be covered with clear plastic, have a metal frame. Room number on directories shall be Owner's numbers, not Plan numbers unless Owner so specifies.

END OF SECTION

SECTION 26 24 16

PANELBOARDS

PART 1 - GENERAL

1.01 Scope

A. The work under this section includes main, distribution and branch circuit panelboards.

1.02 Submittals

A. Include outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, and circuit breaker arrangement and sizes.

1.03 Operation and Maintenance Data

A. All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

1.04 Spare Parts

A. Keys: Furnish 2 keys for each panelboard to Owner.

PART 2 - PRODUCTS

2.01 Main and Distribution Panelboards

A. Panelboards: Circuit breaker type.

B. Enclosure: NEMA Type 1 or 3R as applicable. Minimum cabinet size: 5-3/4 inches (144 mm) deep; 20 inches (508 mm) wide, with 5" minimum gutter space top and bottom. Constructed of galvanized code gauge steel.

C. Provide cabinet front with hinged door with flush lock. Front cover shall be hinged to allow access to wiring gutters without removal of panel trim. Hinged trim shall be held in place with screw fasteners. Finish in manufacturer's standard gray enamel.

D. Provide metal directory holders with clear plastic covers.

E. Provide panelboards with copper bus (phase buses, bus fingers, etc.), ratings as scheduled on Drawings. Provide ground bars in all panelboards. Neutral and ground bars can be dual rated ALCU9. All spaces shall have bus fully extended and drilled for the future installation of breakers.

F. Minimum System (i.e. individual component) Short Circuit Rating: As shown on the Drawings.

G. Molded Case Circuit Breakers: Provide circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Provide circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.

H. Circuit breakers shall be bolt-on type with common trip handle for all poles. No handle ties of any sort will be approved.

2.02 Branch Circuit Panelboards

A. Lighting and Appliance Branch Circuit Panelboards: Circuit breaker type.

B. Enclosure: NEMA Type 1 or 3R as applicable. Minimum cabinet size: 5-3/4 inches (144 mm) deep; 20 inches (508 mm) wide with 5" minimum gutter space top and bottom. Constructed of galvanized code gauge steel. Panel enclosure (back box) shall be of non-stamped type (without KO's) to avoid concentric break out problem.

C. Provide flush or surface cabinet front, as indicated on drawings, with concealed trim clamps, concealed hinge and flush cylinder lock all keyed alike. Front cover shall be hinged to allow access to wiring gutters without removal of panel trim. Hinged trim shall be held in place with screw fasteners. Finish in manufacturer's standard gray enamel.

D. Provide metal directory holders with clear plastic covers.

E. Provide panelboards with copper bus (phase buses, bus fingers, etc.), ratings as scheduled on Drawings. Provide ground bars in all panelboards. Neutral and ground bars can be dual rated ALCU9. All spaces shall have bus fully extended and drilled for the future installation of breakers.

F. Minimum System (i.e. individual component) Short Circuit Rating: As shown on the Drawings.

G. Molded Case Circuit Breakers: Bolt-on type thermal magnetic trip circuit breakers. Provide UL Class A ground fault interrupter circuit breakers where shown on Drawings. Provide circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.

H. Do not use tandem circuit breakers.

I. Circuit breakers shall be bolt-on type with common trip handle for all poles. No handle ties of any sort will be approved.

J. All of the panelboards provided under this section shall be by the same manufacturer.

PART 3 - EXECUTION

3.01 Installation

A. See section 26 05 29 for support requirements.

B. Install panelboards plumb with wall finishes.

C. Height: 6 ft (2 m) to top.

D. Install a crimp type stud termination to stranded conductor when terminating on circuit breakers without a captive assembly rated for terminating stranded conductors.

E. Provide filler plates for unused spaces in panelboards.

F. See section 26 05 53 for identification requirements. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.

3.02 Field Quality Control

A. The Contractor shall circuit the panelboards as shown on the drawings. Measure steady state load currents at each panelboard feeder. Should the difference at any panelboard between phases exceed 10 percent, rearrange circuits in the panelboard to balance the phase loads within 10 percent.

B. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections.

END OF SECTION

SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.01 Scope

A. The work under this section includes wall switches, receptacles, device plates and box covers.

1.02 Submittals

A. Provide product data showing model numbers, configurations, finishes, dimensions, and manufacturer's instructions.

1.03 Operation and Maintenance Data

A. All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

PART 2 - PRODUCTS

2.01 Wall Switches

A. Wall Switches for Lighting Circuits and Motor Loads Under 1/2 HP: Heavy duty use toggle switch, rated 20 amperes and 120/277 volts AC. Switches shall be UL20 Listed and meet Federal Specification WS-896. All switches shall be heavy duty Specification Grade with separate green ground screw.

B. All switches shall be back and side wired, screw clamp type, suitable for solid or stranded wire up to #10 AWG. Switches shall be Leviton model 1221-S, Hubbell model CS1221, Pass & Seymour model CSB20, Cooper model CSB120, or approved equal.

C. Handle: Ivory, made of nylon or high impact resistant material.

2.02 Receptacles

A. GFCI Receptacles: Duplex convenience receptacle, Specification Grade, with integral ground fault current interrupter meeting the requirements of UL standard 943 Class A and UL standard 498. GFCI receptacles shall be Leviton model 8899, Hubbell model GRF5352, Pass & Seymour model 2095 or approved equal.

B. Generally, all receptacles shall be duplex type unless otherwise noted.

C. All receptacles installed in outdoor locations and in other damp or wet locations shall be WR, TR, and GFCI type.

2.03 Device Plates and Box Covers

A. Decorative Cover Plate: 302/304 smooth stainless steel.

B. Weatherproof In-Use Cover: Gasketed metal with hinged device cover.

C. Surface Cover Plate: Raised galvanized steel.

PART 3 - EXECUTION

3.01 Installation

A. Install wall switches 42 inches above floor, OFF position down.

B. Install convenience receptacles 18 inches above floor, 4 inches above counters or backsplash, grounding pole on bottom, unless noted otherwise.

C. Install specific-use receptacles at heights shown on Contract Drawings.

D. Install decorative plates on switch, receptacle, and blank outlets in finished areas.

E. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface-mounted outlets.

F. Install devices and wall plates flush and level.

G. Receptacles shall have a bonding conductor from grounding terminal to the metal conduit system. Self-grounding receptacles using mounting screws as bonding means are not approved.

3.02 Field Quality Control

A. Inspect each wiring device for defects.

B. Operate each wall switch with circuit energized and verify proper operation.

C. Verify that each receptacle device is energized.

D. Test each receptacle device for proper polarity.

E. Test each GFCI receptacle device for proper operation.

F. The Owner's Representative and A/E personnel reserve the right to be present at all tests.

3.03 Adjusting

A. Adjust devices and wall plates to be flush and level.

B. Mark all conductors with the panel and circuit number serving the device with a machine generated label, at the device, and on the device cover.

END OF SECTION

SECTION 26 28 30

ELECTRIC VEHICLE CHARGING STATIONS

PART 1 GENERAL

1.01 Scope

A. Electric Vehicle Charging Stations, including all accessories.

1.02 Related Work

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

1.03 Submittals

A. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

B. Shop Drawings: Indicate area layout, equipment locations, details of assembly and anchorage.

C. Operation and Maintenance Data: For entire system.

D. The electrical contractor is responsible for all necessary permits, fees, and electrical inspections associated with this installation.

1.04 Quality Assurance

A. Manufacturer Qualifications: A company with not less than 5 years of experience in manufacturing components of the type required for this project.

B. Regulatory Requirements: Provide UL listed equipment and controls.

1.05 Delivery, Storage, and Handling

A. Deliver and store products as recommended by manufacturer until installation.

1.06 Warranty

A. Warranty: Provide manufacturer's standard warranty.

PART 2 PRODUCTS

2.01 Manufacturers

A. Acceptable Manufacturer: Clipper Creek, 11850 Kemper Road #E, Auburn, CA 95603; Toll Free Tel: 1-877-694-4194; Web: store.clippercreek.com

B. Substitutions: **No equipment substitution will be considered unless a written request has been submitted to the Owner for "conditional approval" at least ten (10) calendar days prior to the date set for receipt of bids. Equipment submitted after this date will be rejected.**

Each such request shall include the following:

- A complete description of the proposed equipment for which the proposed substitute is being submitted.

- Equipment cut sheets, clearly indicating the Manufacturer, Catalog Number, and all components and accessories.
- Additional information may be requested by the Owner.

The decision regarding “conditional approval” shall be at the sole discretion of the Owner. If the Owner grants “conditional approval”, such approval shall not be considered official until it is set forth in an Addendum. The Owner’s “conditional approval” of substitutions is based on a cursory review, and shall not be interpreted as a formal submittal as required under other Articles or Sections of the Contract Documents.

2.02 Pedestal Mount Charging Station

A. Clipper Creek Charging Station HCS-40R, 32 Amp, Level 2 EVSE, 240V with 25ft cable.
   1. Number of Units: 2
   2. Part Number 0918-00-003
   3. Charging Power: 32 Amp (7.7kW max).
   4. Supply Circuit: 208/240V, 40A
   5. Warranty: 3 years
   6. Cable Length: 25 Ft
   7. Accessories Included: SAE J1772 Connector Holster, Connector Lock and Keys
   8. Enclosure: Fully Sealed NEMA 4

B. Clipper Creek Dual-Mount Pedestal Extension Kit
   1. Number of Units: 1
   2. Part Number 0300-00-028

C. Clipper Creek Pedestal Kit for HCS EV
   1. Number of Units: 1
   2. Part Number 0300-00-033

D. Clipper Creek HCS Pedestal Dual Mount Kit s
   1. Number of Units: 1
   2. Part Number 0300-00-030

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that required utilities are properly sized and in correct locations.

B. Verify that substrates are in proper condition to receive work of this section. Do not begin installation until substrates have been properly prepared.

C. If substrate preparation is the responsibility of another installer, notify Owner of unsatisfactory preparation before proceeding

3.02 INSTALLATION

A. Construct a concrete base as specified in the plans, and specs.

B. Install units and accessories in accordance with approved shop drawings and manufacturer's printed instructions. Test for proper operation. Install in proper relationship with adjacent construction.

3.03 CLEANING AND PROTECTION

A. Clean soiled surfaces in accordance with manufacturer's instructions.

B. Protect components from damage until completion of project.

C. Touch-up, repair or replace damaged products after Substantial Completion

END OF SECTION

SECTION 26 51 13

LIGHTING FIXTURES AND COMPONENTS

PART 1 - GENERAL

1.01 Scope

A. The work under this section includes interior luminaires and accessories, LEDs, and drivers.

1.02 Related Work

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

1.03 Submittals

A. Include outline drawings, LED and driver data, support points, weights, accessory information and performance data for each luminaire type.

B. For each luminaire type, submit luminaire information including catalog cuts with highlighted catalog numbers and required accessories:

- Luminaire:
  - Manufacturer and catalog number.
  - Type (identification) as indicated on the plans and schedule.
- Drivers:
  - Manufacturer and catalog number.
  - Type, THD, etc.
  - Quantity per luminaire.
- LEDs:
  - Manufacturer, catalog number, and wattage
  - Quantity per luminaire

1.04 Operation and Maintenance Data

A. All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

1.05 Extra Material

A. Provide one (1) of each type of LED module, light bar, or array (if applicable). If the LED's are integrated into the luminaire and are not separate components, then extra LED's are not required.

C. Provide not less than one (1) LED driver of each type.

PART 2 - PRODUCTS

2.01 Luminaires and Accessories

A. Refer to Lighting Fixture Schedule on the Drawings. Fixtures which are specified on the Drawings are for quality and performance requirements only. Fixtures manufactured by others are equally acceptable provided they meet or exceed the quality & performance of the specified fixtures, and meet the intent of the design, including aesthetics.

No fixture substitution will be considered unless a written request has been submitted to the Engineer for "conditional approval" at least ten (10) calendar days prior to the date set for receipt of bids. Fixtures submitted after this date will be rejected.

Each such request shall include the following:

- A complete description of the proposed substitute, including Fixture Type, for which the proposed substitute is being submitted.
- Fixture cut sheets, clearly indicating the Manufacturer, Catalog Number, and all components and accessories.
- In addition, illuminance calculations may be requested by the Engineer.

The decision regarding “conditional approval” shall be at the sole discretion of the Engineer. If the Engineer grants “conditional approval”, such approval shall not be considered official until it is set forth in an Addendum. The Engineer’s “conditional approval” of substitutions is based on a cursory review, and shall not be interpreted as a formal submittal as required under other Articles or Sections of the Contract Documents.

B. Provide fixtures with quick-connect disconnecting means, similar to Thomas & Betts Sta-Kon.

2.02 LED Luminaires

A. Color Temperature of LED luminaires should not exceed 3000K (nominal).

B. Color Consistency: LED manufacturer shall use a maximum 3-step MacAdam Ellipse binning process to achieve consistent luminaire-to-luminaire color for interior luminaires. Exterior luminaires shall use a maximum 5-step MacAdam Ellipse binning process.

C. Luminaire shall be mercury-free, lead-free, and RoHS compliant.

D. Luminaire shall comply with FCC 47 CFR part 15 non-consumer RFI/EMI standards.

E. Light output of the LED system shall be measured using the absolute photometry method following IES LM-79 and IES LM-80 requirements and guidelines.

F. Luminaire shall maintain 70% lumen output (L70) for a minimum of 50,000 hours.

G. Driver shall have a rated life of 50,000 hours, minimum.

H. Lumen output shall not depreciate more than 20% after 10,000 hours of use.

I. Driver and LEDs shall be furnished from a single manufacturer to ensure compatibility.

J. Luminaire Color Rendering Index (CRI) shall be a minimum of 80 for interior luminaires, and a minimum of 70 for exterior luminaires.

K. LED luminaire shall be thermally designed as to not exceed the maximum junction temperature of the LED for the ambient temperature of the location the luminaire is to be installed. Rated case temperature shall be suitable for operation in the ambient temperatures typically found for the intended installation. Exterior luminaires to operate in ambient temperatures of -20°F to 122°F (-29°C to 50°C).

L. LED driver shall have a minimum power factor (pf) of 0.9 and a maximum crest factor (cf) of 1.5 at full input power and across specified voltage range.

M. Luminaire shall operate normally for input voltage fluctuations of plus or minus 10 percent.

N. Luminaire shall have a maximum Total Harmonic Distortion (THD) of 20% at full input power and across specified voltage range.

O. Wiring connections to LED drivers shall utilize polarized quick-disconnects for field maintenance.

P. All connections to luminaires shall be reverse polarity protected and provide high voltage protection in the event connections are reversed or shorted during the installation process.

Q. Fuse Protections: All luminaires shall have built-in fuse protection. All power supply outputs shall be either fuse protected or be Polymeric Positive Temperature Coefficient (PTC)-protected as per Class 2 UL listing.

R. All luminaires shall be provided with knockouts for conduit connections.

S. The LED luminaire shall carry a limited 5-year warranty minimum for LED light engine(s)/board array, and driver(s).

T. Provide all of the following data on submittals:
- Delivered lumens
- Input watts
- Efficacy
- Color rendering index.

PART 3 - EXECUTION

3.01 Installation

A. Install in accordance with manufacturer's instructions.

B. Install surface mounted luminaires plumb and adjust to align with building lines and with each other. Secure to prohibit movement.

C. The Contractor shall install fixture supports as required. Fixture installations with fixtures supported only by insecure boxes will be rejected. It shall be the Contractor's responsibility to support all lighting fixtures adequately, providing extra steel work for the support of fixtures if required. Any components necessary for mounting fixtures shall be provided by the Contractor. No plastic, composition or wood type anchors shall be used.

D. Install wall mounted luminaires at height as scheduled.

E. Install accessories furnished with each luminaire.

F. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.

G. Bond fixtures and metal accessories to branch circuit equipment grounding conductor.

H. All new fixtures shall be operational at the Substantial Completion of the project.

3.02 Adjusting and Cleaning

A. Align luminaires and clean lenses and diffusers at completion of Work. Clean paint splatters, dirt, and debris from installed luminaires.

B. Aim and adjust luminaires as indicated on Drawings or as directed by the A/E.

C. Touch up luminaire finish at completion of work.

3.03 Field Quality Control

A. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.04 All Fixture Connections

A. Direct box or conduit connections for surface fixtures.

END OF SECTION

SECTION 31 22 00

SITE PREPARATION AND EARTHWORK

PART 1 - GENERAL

1.01 Section Includes

A. Clearing site of debris, grass, trees and other plant life in preparation for construction.

B. Protection of existing structures, trees or vegetation to remain.

C. Stripping of topsoil from areas to be incorporated into the work.

D. Excavation, filling and compaction for site grading and paved surface subgrade preparation.

1.02 Related Sections

A. Section 01 45 16 – Testing Requirements.

1.03 References

A. ASTM D 1557 - Standard Test Methods Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

B. ASTM D2487 - Classification of Soils for Engineering Purposes.

C. ASTM D2922 - Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

D. ASTM D3017 - Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.04 Submittals

A. Submit compaction test reports.

PART 2 - PRODUCTS

2.01 Materials

A. Common Fill: On-site or off-site natural soil free from organic matter, debris, vegetation, stones larger than 6” and frozen material and classified in ASTM D2487 as follows:
- GW - Well-graded gravels, gravel-sand mixtures, little or no fines.
- GP - Poorly-graded gravels, gravel-sand mixtures, little or no fines.
- GM - Silty gravels, gravel-sand-silt mixtures.
- GC - Clayey gravels, gravel-sand-clay mixtures.
- SW - Well-graded sands, gravelly sands, little or no fines.
- SP - Poorly-graded sands, gravelly sands, little or no fines.
- SM - Silty sands, sand-silt mixture.
- SC - Clayey sands, sand-clay mixtures.
- 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.

B. Breaker Run: Crushed stone meeting the following gradation:

5-Inch Breaker Run	
Sieve Size	% Passing by Weight
5 inch	90 - 100
1-1/2 inch	20 - 50
No. 10	0 - 10

3-Inch Breaker Run	
Sieve Size	% Passing by Weight
3 inch	90 - 100
1-1/2 inch	60 - 85
3/4 inch	40 - 65
No. 4	15 - 40
No. 10	10 - 30
No. 40	5 - 20
No. 200	2 - 12

C. Geotextile: A geotextile fabric woven from polyester or polypropylene. The geotextile shall be insect, rodent, mildew, rot, and UV resistant. The geotextile shall have the following minimum requirements:

Geotextile Properties		
Property	Test Method	Requirement*
Grab Tensile Strength, lbs.	ASTM D4632	200
Elongation, %	ASTM D4632	15
Puncture, lbs.	ASTM D4833	120
Trapezoidal Tear, lbs.	ASTM D4533	80

*Minimum average roll value

Mirafi 500X, TenCate Geosynthetics; 80EX, Thrace-LINQ, Inc; Soiltex ST205N, Geo-Synthetics, Inc. or equal.

PART 3 - EXECUTION

3.01 Protection

A. Locate and identify existing utilities that are to remain and protect them from damage.

B. Protect trees, plants, structures, site improvements and features designated to remain.

C. Protect bench marks, property corners and other survey monuments from damage or displacement.

3.02 Clearing

A. Clear area within the clearing limits shown on the Drawings. If no clearing limits are shown, clear five feet outside of the grading limits, but not beyond project property boundaries.

B. Remove trees, saplings, shrubs, bushes, vines and undergrowth within the clearing limits to the height above ground as follows:
1. Trees over six inch diameter; six inches.
2. Trees, shrubs and bushes under six inch diameter; three inches.
3. Vines and undergrowth; two inches.

3.03 Grubbing

A. Remove all stumps, main root balls and root systems to the minimum depths indicated:
1. Beneath footings: 18 inches.
2. Beneath paved roads, parking areas and walks: 24 inches below sub-grade.
3. Beneath turf: 12 inches.
4. In fill areas: 12 inches.

3.04 Topsoil Excavation

A. Cut heavy growths of grass from areas to be stripped.

B. Strip topsoil from all areas to be excavated, regraded or landscaped to a depth that prevents the intermingling of the topsoil with the subsoil.

C. Topsoil is defined as surficial soil containing organic matter that sustains plant life.

D. Stockpile the stripped topsoil on the site for reuse. If stockpile location is not shown on the Drawings, coordinate the location with the Engineer.

E. Provide erosion protection for all stockpiled topsoil.

3.05 Pavement Removal

A. Remove existing pavement and dispose of off-site. Removal of pavement will be considered incidental to the work unless indicated otherwise.

B. Provide a straight, clean, vertical saw cut joint between pavement being removed and pavement to remain. Use power saw for cutting. Steel disk cutters mounted on power shovel bucket are not acceptable.

3.06 Lines and Grade

A. Streets
   1. Construct the finish subgrade to the line, grade, and cross section as shown on the Drawings.
   2. The Engineer will provide grade stakes at a minimum distance of 50 feet along the centerline. Provide Engineer with a minimum of 48 hours notice of the need for grade stakes.
   3. Contractor may use slope meters or GPS type controls on machines for grade control. However, the contractor is responsible for verifying the finish grade elevations with a level at a minimum of every 50 feet along the centerline.

B. Site Grading
   1. Construct the finish subgrade to contours shown on the Drawings.
   2. The Engineer will provide grade stakes as appropriate for the Work.
   3. Contractor may use slope meters or GPS type controls on machines for grade control. However, the contractor is responsible for verifying the finish grade elevations.

3.07 Grading and Subgrade Preparation

A. Cut and fill to the required grades and cross section and contours.

B. Scarify surface of cut areas and compact to the degree required for subsequent backfill.

C. Place fill material in continuous layers not exceeding 8” compacted thickness.

D. For proposed streets and parking lots, roll the surface with a steel drum roller to provide a relatively impervious surface where additional filling or excavation is necessary or placement of base course will be delayed.

E. Maintain surface drainage during construction.

F. Remove excess material from site. If borrow is needed, provide material meeting requirements of 2.01 for common fill.

G. Grading contractor shall grade roads and other surfaces to be paved to rough subgrade elevation prior to installation of utilities. After utility installation, the grading contractor shall grade to finish subgrade elevation.

H. Prior to placement of topsoil, areas that have been compacted by construction traffic shall be scarified to a minimum depth of 12 inches using a chisel plow or ripper arms on a dozer. Scarifying shall be performed along the contour.

3.08 Compaction

A. Adjust moisture content of fill material to accomplish the required degree of compaction.

B. Use a sheepsfoot roller for cohesive soils and a smooth drum vibratory roller for granular soils.

C. Compact to the percent of maximum dry density as listed below in accordance with ASTM D1557.

Compaction Requirements		
Area	Cohesive Soils	Granular Soils
Beneath Turf	85%	85%
Beneath Walks & Curbs	90%	95%
Beneath Paving	90%	95%
Building Pad Area	90%	95%
Storm Water/Treatment Pond Berms	90%	95%

3.09 Proof Rolling

A. Proof roll the finished pavement subgrade in the presence of the Engineer. Provide 24-hour notice to the Engineer as to when the proof-rolling will be performed.

B. Prior to proof rolling, the entire roadway subgrade shall have a relatively smooth surface, suitable for observing soil reaction during proof rolling.

C. Provide a loaded tri-axle dump truck with a minimum gross weight of 30 tons.

D. Proof rolling shall be accomplished in a series of traverses parallel to the centerline of the street or parking area. The truck shall traverse the length of the street or parking area once for each 12 feet of width. Additional passes may be directed by the Engineer.

E. Soft areas, yielding areas, cracked areas, or areas where rolling or wave action is observed shall be considered indicative of unsatisfactory subgrade. Such areas shall be undercut, replaced with suitable fill material, and recompacted.

F. Once the subgrade has been proof rolled and approved, protect the soils from becoming saturated, frozen, or adversely affected.

3.10 Subgrade Stabilization

A. If ordered by the Engineer or if indicated in the Contract Documents, subgrade material that cannot be adequately compacted shall be removed and replaced with breaker run material and/or geotextile.

B. The depth of the undercut, breaker run size, and/or geotextile requirement will be at the discretion of the Engineer.

C. Unless otherwise indicated within the contract documents, subgrade stabilization with breaker run material will be paid for by the in-place cubic yard including excavation, furnishing and placement of breaker run material, and disposal of undercut material.

3.11 Geotextile Placement

A. Clear area of sharp objects, stumps, and large stones that would puncture geotextile.

B. Roll geotextile onto the subgrade by hand in the longitudinal direction. Overlap adjacent strips two feet.

C. Back-dump aggregate onto the geotextile beginning at a point just before the fabric and on firm soil. No vehicular traffic will be allowed directly on the geotextile. Spread the aggregate with a bulldozer. The first lift shall be as thick as possible to prevent over-stressing of the subgrade.

D. Take care during aggregate placement to prevent damage to the geotextile. Repair damages or tears by placing a piece of geotextile over the damaged area. Overlap the repair piece onto the undamaged area a minimum of three feet.

E. Compaction: Perform initial compaction with bulldozers while spreading. Perform final compaction with a vibratory compactor, first without vibration for several passes, followed with vibration. Do not grade down ruts; fill with additional aggregate and compact.

3.12 Tolerances

A. Top Surface of Road Subgrade:
   1. Rough Grade: Plus or minus 0.25 ft.
   2. Finish Subgrade: Plus or minus 0.05 ft.

B. Top Surface of General Grading: Plus or minus 0.1 ft.

3.13 Field Quality Control

A. Field inspection will be performed by an authorized representative of the Owner.

B. Contractor is responsible for meeting the compaction requirements. The Contractor shall hire and pay for an independent testing firm to perform compaction tests to confirm the in-place density.

C. For general grading, perform one test per 9,000 square yards or part thereof of fill placed per lift. In addition, perform one test per building lot where fill is placed. For streets perform one test per 1,000 square yards or part thereof of fill placed per lift. Engineer or Owner's Representative will direct location of tests.

D. Additional tests may be required if compaction requirements are not being met. The cost of these additional tests are the responsibility of the Contractor.

E. Determination of moisture content shall be in accordance with ASTM D3017. Determination of density shall be in accordance with ASTM D2922.

3.14 Disposal

A. Dispose of all plant material off-site at a location meeting state landfill requirements.

B. Burning at the site will not be permitted.

C. Dispose of excess soil materials or unsuitable material off-site unless on-site disposal is indicated, or approved by Owner.

END OF SECTION

SECTION 31 23 00

STRUCTURAL EXCAVATION, BACKFILL, AND COMPACTION

PART 1 - GENERAL

1.01 Section Includes

A. Excavation for structures.

B. Backfill and compaction for structures.

1.02 Related Sections

A. Section 01 45 16 – Testing Requirements.

1.03 References

A. ASTM D 1557 - Standard Test Methods Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

B. ASTM D2487 - Classification of Soils for Engineering Purposes.

C. ASTM D2922 - Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

D. ASTM D3017 - Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.04 Submittals

A. Submit compaction test reports.

PART 2 - PRODUCTS

2.01 Materials

A. Structural Fill: On-site or off-site natural soil free from organic matter, debris, vegetation, stones larger than 6” and frozen material and described in ASTM D2487 as follows:

GW - Well-graded gravels, gravel-sand mixtures, little or no fines.
GP - Poorly-graded gravels, gravel-sand mixtures, little or no fines.
GM - Silty gravels, gravel-sand-silt mixtures.
GC - Clayey gravels, gravel-sand-clay mixtures.
SW - Well-graded sands, gravelly sands, little or no fines.
SP - Poorly-graded sands, gravelly sands, little or no fines.
SM - Silty sands, sand-silt mixture.
SC - Clayey sands, sand-clay mixtures.

B. Common Fill: Same as structural fill plus soils classified in ASTM D2487 as follows:

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.

C. Sand: Clean, granular material meeting the following gradation:

Sieve Size	Percent Passing by Weight
3/8 Inch	100
No. 4	90 - 100
No. 16	45 - 80
No. 50	10 - 30
No. 100	2 - 10
No. 200	0 - 5

PART 3 - EXECUTION

3.01 Preparation

A. Identify required lines, elevations and grades.

B. Protect benchmarks, property corners and grade stakes.

C. Locate and identify utilities that are to remain and protect them from damage.

D. Protect plant life, turf, fences, structures and other site improvements from damage.

3.02 Excavation

A. Excavate structure area to line and grade. Do not excavate below indicated depth except to remove unsuitable material.

B. Dispose of unsuitable material. Stockpile suitable material for reuse as backfill.

C. Scarify surface of excavated areas and compact to the degree required for subsequent backfill.

D. Excavation walls more than five feet in depth shall be shored or cut back to a stable slope. Meet requirements of Department of Labor, Occupational Safety and Health Administration (OSHA).

E. Provide necessary equipment to remove water from excavation.

3.03 Backfilling and Compaction

A. Place fill in continuous layers not exceeding 8” compacted thickness.

B. Maintain optimum moisture content of fill material to accomplish the required degree of compaction.

C. Do not place frozen material and do not place fill on frozen ground.

D. Backfill interior and exterior of walls simultaneously.

E. Do not backfill against walls prior to completion of curing period.

F. Provide fill material as indicated in the schedule.

G. Compact to the percent of maximum dry density as listed in the schedule in accordance with ASTM D1557.

H. Schedule

Area	Fill Material	Percent Compaction
Beneath Floor Slabs		
Top 6 Inches	Sand	95
Below 6 Inches	Structural Fill	95
Foundation Walls		
Interior	Structural Fill	92
Exterior	Structural Fill	92
Walks & Pavement	Structural Fill	95
Beyond 10 Ft. from Structure	Common Fill	85

3.04 Tolerances

A. Under Paved Areas: Plus or minus 0.1 ft.

B. Under Slabs-On-Grade: Plus or minus 0.1 ft.

C. Under Turf: Plus or minus 0.2 ft.

3.05 Field Quality Control

A. Field inspection will be performed by an authorized representative of the Owner.

B. Contractor is responsible for meeting the compaction requirements. The Contractor shall hire an independent testing firm to perform compaction tests to confirm the in-place density.

C. Determination of moisture content shall be in accordance with ASTM D3017. Determination of density shall be in accordance with ASTM D2922.

END OF SECTION

SECTION 31 23 33

UTILITY EXCAVATION, BACKFILLING AND COMPACTION

PART 1 – GENERAL

1.01 Section Includes

A. Excavation of trenches for below grade piping and conduit.

B. Backfilling and compaction.

1.02 Related Sections

A. Section 01 45 16 – Testing Requirements.

1.03 References

A. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregate.

B. ASTM D1557 - Standard Test Methods Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

C. ASTM D2487 - Classification of Soils for Engineering Purposes.

1.04 Submittals

A. Submit 50 lb. sample of off-site backfill materials.

B. Submit gradation of select granular backfill.

PART 2 – PRODUCTS

2.01 Materials

A. Crushed Stone: Hard, durable particles of crushed stone or gravel substantially free from shale or lumps of clay or loam meeting the following gradation:

Crushed Stone Gradation	
Sieve Size	% Passing By Weight
2 Inch	100
1-1/2 Inch	90 - 100
1 Inch	35 - 70
3/4 Inch	0 - 15
1/2 Inch	0 - 5

B. Trench Backfill: Natural soils, free of organic matter, trash, deleterious materials, stones larger than eight inches and frozen material and classified in ASTM D2487 as follows:

GW - Well-graded gravels, gravel-sand mixtures, little or no fines.
GP - Poorly-graded gravels, gravel-sand mixtures, little or no fines.
GM - Silty gravels, gravel-sand-silt mixtures.
GC - Clayey gravels, gravel-sand-clay mixtures.
SW - Well-graded sands, gravelly sands, little or no fines.
SP - Poorly-graded sands, gravelly sands, little or no fines.
SM - Silty sands, sand-silt mixture.
SC - Clayey sands, sand-clay mixtures.
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.

Soils classified in ASTM D2487 as follows are not acceptable:

OL - Organic silts and organic silty clays of low plasticity.
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.
Pt - Peat and other highly organic soils.

C. Select Granular Backfill: Durable particles ranging from fine to coarse in a substantially uniform combination. Sufficient fine material shall be present to fill all the voids of the coarse material. Some fine clay or loam particles are desirable, but they shall not be present in the form of lumps. Granular backfill shall conform to the following gradation:

Granular Backfill Gradation	
Sieve Size	% Passing By Weight
3 Inch	100
2 Inch	95 - 100
No. 4	35 - 60
Finer than No. 200	5 - 15

D. Bedding: See individual specification sections.

PART 3 – EXECUTION

3.01 Examination

A. Verify fill materials to be used are acceptable.

3.02 Preparation

A. Identify required lines, levels, contours, and datum.

B. Maintain and protect existing utilities remaining which pass through work area.

C. Protect plant life, lawns, and other features remaining as a portion of the final landscaping.

D. Protect benchmarks and existing features from excavation equipment and vehicular traffic.

E. Protect above and below grade utilities which are to remain.

F. Strip topsoil and stockpile on–site for reuse.

G. When excavating across or within existing pavement, saw cut in neat, straight, vertical lines.

3.03 Minor Trench Water

A. Do not allow water to accumulate in the trench.

B. Provide all equipment needed to accomplish the Work. Unless indicated otherwise, no additional compensation will be made for removing trench water.

C. No additional compensation will be made for crushed stone used for trench drainage.

D. Dispose of water in a suitable manner, and in accordance with regulations of the Wisconsin Department of Natural Resources, without damage to property.

3.04 Excavation

A. Excavate subsoil to required depth and grade.

B. Cut trenches sufficiently wide to enable installation of the utilities and allow inspection. Normal trench width below the top of the pipe shall be the nominal pipe diameter plus 24 inches.

C. Do not undercut trench walls.

D. Trench walls more than five feet in depth shall be shored, cut back to stable slope or provided with equivalent means of protection in accordance with the applicable rules of the Department of Labor, Occupational Safety and Health Administration (OSHA). Provide a ladder for trench exit in trenches over four feet deep.

E. Excess excavation below the required level shall be backfilled with crushed stone at the Contractor's expense.

F. If the trench bottom is unstable due to soil material or groundwater conditions, an additional 3 inches shall be excavated and backfilled with crushed stone as specified in Part 2. There will be no extra payment for the additional excavation and stone. If it is necessary to excavate to a greater depth to provide a stable trench, the Contractor will be paid for the additional excavation and stone, if the extra excavation was ordered by the Engineer or approved by the Engineer prior to the work being performed.

G. Remove ledge rock, boulders or large stones to provide a minimum clearance of 6 inches between the pipe and the rock. See Section on Rock Excavation, if included.

H. Not more than 100 feet of trench shall be open ahead or behind the pipe laying. Additional trenching will not be allowed if earlier trenches have not been backfilled or if the trench surfaces are unsatisfactory.

I. Utility contractor is responsible for the disposition of excess material resulting from the utility construction. Stockpile excess excavated material in areas designated on the Drawings. If stockpile areas are not designated on the Drawings, dispose of the material offsite.

3.05 Backfilling

A. Backfill trenches with excavated material meeting the requirements for backfill specified in Part 2 above. Use select granular backfill only when indicated on the Drawings or elsewhere in the Project Manual.

B. Backfill trenches to the rough subgrade elevation, plus or minus 0.25 ft.

C. Place material in continuous layers not exceeding 8 inches compacted thickness. Compact each layer to the percent of maximum dry density as listed below in accordance with ASTM D1557.

D. Compaction Requirements: Meet the following compaction requirements:

Compaction Requirements		
Area	Cohesive Soil	Granular Soil
Beneath Turf	85%	85%
Beneath Structures	90%	95%
Beneath Paving	90%	95%

E. Maintain moisture content of backfill materials to attain required compaction density.

3.06 Restoration

A. Remove excess excavation immediately after completion of backfilling.

B. If site restoration is required, commence immediately after backfilling is completed.

C. Maintain roadways in a driveable condition, acceptable to the Engineer, prior to pavement restoration.

3.07 Field Quality Control

A. Field inspection will be performed by an authorized representative of the Owner.

B. Contractor is responsible for meeting the compaction requirements. The Contractor shall hire an independent testing firm to perform compaction tests to confirm the in-place density.

C. Testing Requirements: Four tests at various depths per 400 feet of trench. Engineer or Owner's Representative will direct the location of the tests.

D. Additional tests may be required if compaction requirements are not being met. The cost of these additional tests are the responsibility of the Contractor.

E. Determination of moisture content shall be in accordance with ASTM D3017. Determination of density shall be in accordance with ASTM D2922.

END OF SECTION

SECTION 31 25 00

CONSTRUCTION SITE EROSION CONTROL

PART 1 - GENERAL

1.01 Section Includes

A. Furnishing, installing, maintaining, and removing erosion and sediment control facilities and measures.

B. The contractor is responsible for providing all erosion control facilities and measures necessary to control erosion and sedimentation at the work site. These facilities and measures may or may not be shown on the Drawings and their absence on the Drawings does not alleviate the contractor from providing them. Any measures and facilities shown on the Drawings are the minimum actions required.

1.02 References

A. WDNR Technical Standards - See DNR website @ http://dnr.state.wi.us/org/water/wm/nps/stormwater/techstds.htm.

B. Wisconsin Department of Transportation, Erosion Control, Product Acceptability Lists for Multi-Modal Applications PAL, Current Edition.

1.03 General

A. Requirements of WDNR Technical Standards shall be followed at all times.

B. Use surface water and erosion control facilities and measures throughout the duration of the construction activity to control the movement of surface water and to reduce the potential for erosion. Maintain the facilities and measures until permanent vegetation is established.

C. Eroded soil material shall not be allowed to leave the construction site or to enter a waterway, lake, or wetland.

D. The Contractor shall be responsible for furnishing, installing, and maintaining the erosion control facilities, and in general, shall use construction practices that minimize erosion.

E. Eroded material that has left the construction site shall be collected and returned to the site by the Contractor.

F. Prevent construction site tracking with graveled roads, access drives, and parking areas of sufficient width and length to prevent sediment from being tracked onto public and private roadways. Any sediment reaching a public or private road shall be removed by street cleaning (not flushing) before the end of each workday.

1.04 Sequencing and Scheduling

A. Construct and stabilize erosion control measures for diversions or outlets prior to any grading or disturbance of the construction site.

B. Install filter fabric and straw bale fences and barriers prior to disturbing the area.

C. Turf areas that have been completed to finish grade shall be stabilized with permanent seeding within seven days. Turf areas where activity has ceased and that will remain exposed for more than 20 days before activity resumes and soil stockpiles shall be stabilized with temporary seeding or soil stabilizer.

D. Other erosion control measures shall be in place prior to disturbance of the construction site, as applicable.

PART 2 - PRODUCTS

2.01 Silt Fence

A. Fabric shall be a woven or nonwoven polyester, polypropylene, stabilized nylon, or polyethylene geotextile with the following minimum properties:

Property	Test Method	Requirement*
Grab tensile strength, lbs min. Machine direction Cross direction	ASTM D4632	 120 100
Max. Apparent opening size, US Sieve	ASTM D 4751	No. 30
Permittivity, sec^{-1}, min.	ASTM D4491	0.05
Min. UV stability at 500 Hrs, %	ASTM D4355	70%

* Minimum or maximum average roll values.

2.02 Straw Bales

A. Straw or hay bales in good condition with nominal dimensions of 14”W x 18”H x 30”L.

B. Stakes: Wood stakes with minimum nominal dimension of 2” x 2” x 30”.

2.03 Sediment Logs

A. Wood excelsior log wrapped in biodegradable fabric or mesh and listed in the Erosion Control Product Acceptability Lists.

B. Stakes: Wood stakes with minimum nominal dimension of 1” x 1” x 24”.

2.04 Temporary Seed

A. Areas needing protection during periods when permanent seeding is not applied shall be seeded with annual species for temporary protection. Provide species as follows:

Species	% Purity
Oats	98
Cereal Rye	97
Winter Wheat	95
Annual Ryegrass	97

B. Provide oats for spring and summer. Provide cereal rye, winter wheat, or annual ryegrass for fall seeding.

2.05 Erosion Mat

A. All erosion mat products shall be of the class and type indicated and shall be chosen from the Erosion Control Product Acceptability Lists.

B. Class I: A short-term duration (six months or greater), light duty, organic mat. Netting shall be non-organic, photodegradable or biodegradable netting. The weight of the netting shall not exceed 15% of the total blanket weight. The netting shall be sufficiently bonded to the parent material to prevent separation for the life of the product.
   1. Type A: A netted product for use on slopes 2.5 to 1 or flatter with a minimum product permissible shear stress of 50 Pa (1.0 lbs/ft^2). Not to be used in channels.
   2. Type B: A double netted product for use on slopes 2 to 1 or flatter or in channels with a minimum product permissible shear stress of 70 PA (1.5 lbs/ft^2).

C. Class II: A long-term duration (3 years or greater), organic mat. The weight of the netting shall not exceed 15% of the total blanket weight. The netting shall be bonded sufficiently to the parent material to prevent separation of the net from the parent material for the life of the product.
   1. Type A: Jute fiber only to be used for reinforcing sod.
   2. Type B: For use on slopes 2:1 or flatter, or in channels with a minimum product permissible shear stress of 95 Pa (2.0 lbs/ft^2). Non-organic, photodegradable, or biodegradable netting allowed.

3. Type C: For use on slopes 2:1 or flatter, or in channels with a minimum product permissible shear stress of 95 Pa (2.0 lbs/ft^2). Only 100% organic fibers allowed. Woven mats are allowed with a maximum opening of ½ inch. Use in environmentally sensitive areas that have a high probability of entrapping animals in the plastic netting.

D. Staples: U-shaped No. 11 gauge or greater wire with a span width of one to two inches and a length of not less than 6 inches for firm soil and 12 inches for loose soil.

2.06 Soil Stabilizer

A. Soil stabilizer shall be a polyacrylamide (PAM) and calcium solution intended to reduce the erodibility of bare soils. The product shall achieve an 80% reduction in soil loss induced by a two inch per hour rainfall simulator.

B. PAM mixtures shall be environmentally benign, harmless to fish, aquatic organisms, wildlife, and plants. Only anionic PAM will be permitted.

C. Anionic PAM, in pure form shall have no more than 0.05% free acrylic monomer by weight, as established by the Food and Drug Administration and the Environmental Protection Agency. The anionic PAM in pure form shall not exceed 200 pounds per batch.

D. The product provided shall be listed in the WisDOT PAL for Type B Soil Stabilizer.

2.07 Inlet Protection

A. Type A: Use around field inlets until permanent stabilization methods have been established. Use on pavement inlets prior to installation of curb and gutter or pavement.

B. Type B: Use on inlets without curb head after casting and grate are in place.

C. Type C: Use on street inlets with curb head.

D. Type D: Use in areas where other typed of inlet protection are incompatible with roadway and traffic conditions causing possible safety hazards when ponding occurs at inlet.

E. Geotextile: Type FF meeting the requirements of the latest edition of WisDOT PAL.

PART 3 - EXECUTION

3.01 Installation of Diversions

A. Temporary diversions shall be designed and installed in accordance with WDNR Conservation Practice Standard, Construction Site Diversion (1066).

3.02 Installation of Silt Fence and Straw Bale Barriers

A. Install straw bale barriers and sediment logs in accordance with the Drawings and WDNR Conservation Practice Standard, Sediment Bale Barrier (1055).

B. Install silt fence in accordance with the Drawings and WDNR Conservation Practice Standard, Silt Fence (1056).

C. Silt fence and straw bale barriers shall be placed on the contour to the extent practicable. Place fences parallel to the slope with the ends of the fence turned upslope a distance of one to two feet. The parallel spacing shall not exceed the maximum slope lengths as indicated in the following Table:

Fence and Barrier Spacing	
Slope	Spacing
<2%	100’
2 - 5%	75’
5 - 10%	50’
10 - 33%	25’
>33%	20’

3.03 Temporary Seeding

A. Provide a seedbed of loose soil to a minimum depth of 2 inches.

B. Apply seed evenly at the rate shown in the following table. Rake or drag to cover the seed to a depth of 1/4 inch.

Species	Lbs./Acre
Oats	131
Cereal Rye	131
Winter Wheat	131
Annual Ryegrass	80

3.04 Erosion Mat Installation

A. Remove stones, clods, sticks, or other foreign material that would damage the mat or interfere with the mat bearing completely on the surface.

B. Install erosion mat in accordance with the manufacturer's recommendations.

C. After seeding has been completed, roll blankets out parallel to the direction of water flow, with the netting on top. Spread the blankets without stretching, making sure the fibers are in contact with the soil. Overlap adjacent strips in accordance with the manufacturer's recommendations. Overlap strip ends a minimum of 10 inches with the upgrade strip on top. Bury the upgrade end of each strip in a vertical trench at least 6 inches deep.

D. Staple the mat strips in accordance with the manufacturer's recommendations. Staple longitudinal overlaps and outer edges at maximum intervals of 3 feet. Staple strip ends at maximum intervals of 16 inches. Place staples throughout the mat at maximum 3-foot intervals. Insert staples flush with the ground surface.

3.05 Soil Stabilizer

A. The manufacturer shall provide detailed written instructions on the storage, mixing, and application procedures.

B. The soil stabilizer may be applied by spraying or by dry spreading.

C. Application Rates: Apply at the rate recommended by the manufacturer.

D. Do not apply within 30 feet of body of water (i.e. lake, river, stormwater pond).

3.06 Ditch Erosion Control

A. The following erosion control measures are minimum requirements for all ditches. The Drawings may include more specific measures.

Ditch Erosion Control		
Slope Range	Method	Bale Checks
0 - 1%	Seed and mulch	None
1% - 4%	Seed and mulch with erosion mat	1% - 2%; Every 200' 2% - 4%; Every 100'
4% - 6%	Staked sod	Every 75'
>6%	Staked sod and/or riprap as specified by Engineer on Drawings	Every 75' for sod

B. Stone Ditch Checks: Unless otherwise indicated on the Drawings, install stone ditch checks at intervals of one ditch check for every two feet of drop in channel grade.

3.07 Installation of Sod in Ditches

A. Lay sod so that joints of abutting ends of strips are not continuous. Lay each strip snugly against previously laid strips.

B. Roll or firmly tamp sod to press the sod into the underlying soil.

C. Turn the upper edges of the strips into the soil.

D. Stake strips along the longitudinal axis at 18-inch intervals and near the top edge of the strip. Provide wood lath or similar stakes, 12 inches long. Leave top of stake approximately 1/2 inch above sod surface.

3.08 Installation of Other Facilities

A. Inlet protection barriers, channel stabilization, grassed waterways, rock lined waterways, sediments traps, sediment basins, and other forms of erosion control measures shall be designed and installed in accordance with *WDNR Technical Standards*.

3.09 Maintenance

A. Inspect diversions within 24 hours after each rainfall or daily during periods of prolonged rainfall, until the vegetative cover is stabilized. Make necessary repairs immediately.

B. Inspect filter fabric fences and barriers within 24 hours after each rainfall or daily during periods of prolonged rainfall. Necessary repairs or replacement shall be made immediately. Remove sediment deposits when deposits reach one-half the height of the fence. Follow manufacturer's recommendations for replacing fabric due to weathering.

C. Inspect straw bale fences and barriers within 24 hours after each rainfall or daily during periods of prolonged rainfall. Necessary repairs or replacement shall be made immediately. Remove sediment deposits when deposits reach one-third the height of the bales. Replace bales after three months.

D. Inspect all seeding, sod, mulches, mats and nets within 24 hours after each rainfall or daily during periods of prolonged rainfall. Additional mulch, netting or matting shall be applied immediately when necessary to maintain suitable coverage. Make inspections until vegetative cover is established. Water seeding and sod when necessary to promote establishment.

E. All other soil erosion control measures should be inspected and repaired immediately, if required, within 24 hours after storm event or daily during periods of prolonged rainfall.

3.10 Removal

A. After final vegetation is established, remove bales, silt fences, ditch checks, diversions, and other erosion control facilities. Restore areas disturbed by the removals.

3.11 Monitoring for WPDES Permit

A. Unless indicated otherwise within the Contract Documents, the Contractor shall be responsible for the monitoring requirements of the WPDES permit for storm water discharges associated with construction activities.

B. Erosion and sediment controls shall be routinely inspected at least every seven days, and within 24 hours after a precipitation event of 0.5 inches or greater. Weekly written reports of all inspections shall be maintained and submitted to the Engineer. The reports shall contain the following information:
   1. Date, time, and exact place of inspection.
   2. Name(s) of individual(s) performing inspection.
   3. An assessment of the condition of erosion and sediment controls.
   4. A description of any erosion and sediment control implementation and maintenance performed.
   5. A description of the sites present phase of construction.

C. The Engineer will provide the Contractor with the appropriate DNR form (see section 00 62 30) to use for the inspections.

END OF SECTION

SECTION 31 37 16

RIPRAP

PART I - GENERAL

1.01 Section Includes

A. Furnishing and placing of stone riprap.

B. Geotextile.

1.02 References

A. ASTM D4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles.

B. ASTM D4751 - Test Method for Determining Apparent Opening Size of a Geotextile.

C. ASTM D4833 - Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.

D. State of Wisconsin Standard Specifications for Highway and Structure Construction, Current Edition (WisDOT).

1.03 Submittals

A. Submit gradation for each riprap size to be used for the Work.

PART 2 - PRODUCTS

2.01 Materials

A. Riprap: Durable field stone or quarry stone, sound, hard and free from seams or cracks. Stones shall be generally round or cubiform in shape with a weight of approximately 165 lbs/cf. Slabby or elongated pieces having a width or thickness less than one-third the length shall not exceed ten percent of the total. The riprap shall conform to the following gradations:

Gradation - Diameter in Inches				
Class	D_{Max}	D_{50}	D_{Min}	WIDOT Equiv. Riprap
1	6	3	2	- - -
2	12	6	3	Light
3	18	9	5	Heavy
4	24	12	7	Extra Heavy

B. Geotextile: A nonwoven fabric consisting of polypropylene, polyethylene, or polyamide. Fabric shall be resistant to insects, rodents, mildew and rot, and protected from UV degradation. Fabric shall meet the following minimum values:

Geotextile Requirements			
Property	Test Method	Requirements*	
		Riprap Class 1 & 2	Riprap Class 3 & 4
Grab tensile strength, lbs. min.	ASTM D4632	205	300
Elongation, percent min.	ASTM D4632	50	50
Puncture strength, lbs	ASTM D4833	500	800
Max. Apparent opening size, US Sieve	ASTM D 4751	No. 80	No. 100

*Typical or average values

PART 3 - EXECUTION

3.01 Geotextile Placement

A. Provide geotextile as required for the class of riprap to be installed.

B. Remove stones or sharp objects from the subgrade that could damage the geotextile.

C. Unroll geotextile directly on the prepared surface.

D. Overlap adjacent sides and ends a minimum of two feet.

E. Toe-in geotextile at top and bottom of slope.

3.02 Riprap Placement

A. Use riprap class indicated on Drawings.

B. Place riprap from bottom to top.

C. Provide a uniform distribution of the various size stones to produce a well-keyed mass.

D. Place to the depth indicated on the Drawings.

E. Do not drop stones from a height greater than one foot.

END OF SECTION

SECTION 32 11 23

CRUSHED AGGREGATE BASE COURSE

PART 1 - GENERAL

1.01 Section Includes

A. Furnishing and placing crushed aggregate base course as a foundation for asphaltic concrete pavement or Portland cement concrete pavement.

1.02 Related Sections

A. Section 01 45 16 – Testing Requirements.

1.03 References

A. ASTM C136 - Sieve Analysis of Fine and Coarse Aggregate.

B. ASTM D1557 - Standard Test Methods Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

C. Wisconsin Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition (WisDOT).

1.04 Submittals

A. Submit aggregate gradation; ASTM C136.

B. Submit truck weight slips. Include as a minimum, truck number, date, time, gross weight, tare weight and net weight.

PART 2 - PRODUCTS

2.01 Crushed Aggregate

A. Meet material requirements of WisDOT.

B. Gradation

1. Except for reclaimed asphaltic pavement, conform to the gradations listed in the following table:

Sieve Size	Percentage Passing By Weight		
	3-Inch Base	1 1/4-Inch Base	3/4-Inch Base
3-Inch	90 - 100	- - -	- - -
1 1/2-Inch	60 - 85	- - -	- - -
1 1/4-Inch	- - -	95 - 100	- - -
1-Inch	- - -	- - -	100
3/4-Inch	40 - 65	70 - 93	95 - 100
3/8-Inch	- - -	42 - 80	50 - 90
No. 4	15 - 40	25 - 63	35 - 70
No. 10	10 - 30	16 - 48	15 - 55
No. 40	5 - 20	8 - 28	10 - 35
No. 200	2 - 12	2 - 12[a, c]	5 - 15[b]

   a. Limited to a maximum of 8 percent in base course placed between new and old pavement.
   b. 8 - 15 percent passing when base is ≥ 50% crushed gravel.
   c. 4 - 10 percent passing when base is ≥ 50% crushed gravel.

2. Use 1 1/4-Inch Base in top 4 or more inches of base. Use 3-Inch Base or 1 1/4-Inch Base in the lower base layers.
3. Use 3/4-Inch Base in the top 3 inches of unpaved portion of the shoulder. Also, if using 3-Inch Base in the lower base layers, use 3/4-Inch Base in the top 3 inches of the shoulder foreslopes. Use 3/4-Inch Base or 1 1/4-Inch Base elsewhere in shoulders.

2.02 Reclaimed Asphaltic Pavement

A. If Contract Documents allow reclaimed asphaltic pavement, the material shall conform to the following:

100 percent passing a 1 1/4-inch sieve.
75 percent or less passing a No. 4 sieve.
Asphalt content between 3 and 6.5 percent.

PART 3 - EXECUTION

3.01 Preparation

A. Check subgrade for conformity with grade and cross section.

B. Remove depressions and ruts that may have been caused after subgrade completion.

C. Proof-roll subgrade prior to placing aggregate with a loaded tandem-axle dump truck under the observance of the Engineer. Subgrade shall not rut or displace significantly under the weight of the loaded truck. Soft or unstable areas that cannot be improved by additional compaction shall be undercut, replaced with suitable fill material, and recompacted.

3.02 Lines and Grade

A. Construct the base course to the line, grade and cross section as shown on the Drawings or as directed by the Engineer.

B. For streets without curb and gutter, the Engineer will provide grade stakes at a minimum distance of 50 feet along the centerline. For streets with curb and gutter, the Engineer will stake the curb and gutter and will provide centerline cuts and fills from the curb stakes. Provide Engineer with a minimum of 48 hours notice of the need for grade stakes.

C. Contractor may use slope meters or GPS type controls on machines for grade control. However, the contractor is responsible for verifying the finish grade elevations with a level at a minimum of every 50 feet along the centerline.

3.03 Equipment

A. The weight, type, capacity and method of operation of all hauling and spreading equipment shall be appropriate for the work and shall not damage the subgrade or previously laid base course. Spreading equipment shall be designed and operated to spread the material in uniform layers without significant segregation.

B. Motor graders used for mixing and shaping shall have weight, rigidity and design suitable for the work.

C. Compaction equipment shall be of the rolling type, vibratory type or combination thereof. Tamping rollers shall exert a weight of not less than 150 pounds per square inch of tamping surface on each tamping foot in a transverse row. Pneumatic-tire rollers or other equipment shall have a weight of not less than 150 pounds per linear inch of overall rolling width.

3.04 Placing Base Course

A. Place material in a manner to minimize segregation and to facilitate spreading in a uniform layer.

B. Place material in maximum 6-inch thick compacted layers. If material is placed in more than one layer, each layer shall be approximately the same thickness.

C. Compact each layer to 95 percent of the maximum dry density in accordance with ASTM D1557. If material is deficient in moisture content for readily attaining the required density, moisten the material as necessary.

D. All material placed on the subgrade or previous layer shall be spread, shaped and compacted on the same day.

3.05 Tolerances

A. Smoothness: Maximum variation of 3/8 inch when measured with a 10-foot straight edge.

B. Compacted Thickness: Plus or minus 1/4 inch.

3.06 Proof Rolling

A. Proof roll the completed base course with a loaded tri-axle dump truck with a minimum gross weight of 30 tons. The surface shall not rut, displace, or roll under the weight of the loaded truck. Soft or unstable areas that cannot be improved by additional compaction shall be replaced and recompacted. Proof rolling shall be done in the presence of the Engineer.

3.07 Field Quality Control

A. Contractor is responsible for meeting the compaction requirements. The Engineer or authorized representative of the owner has the option to require the Contractor to hire an independent testing firm, at the Contractor's expense, to perform compaction tests to confirm the in-place density.

B. Field inspection will be performed by the Engineer or an authorized representative of the Owner.

C. Determination of moisture content shall be in accordance with ASTM D3017. Determination of density shall be in accordance with ASTM D2922.

D. If tests indicate the work does not meet the specified requirements, remove and replace the work.

END OF SECTION

SECTION 32 12 16

ASPHALTIC CONCRETE PAVEMENT

PART 1 - GENERAL

1.01 Section Includes

A. Construction of a one or two course asphaltic concrete pavement to the thickness and cross-section indicated on the Drawings or in the written Bid Documents.

B. Provide the mix indicated on the Drawings or in the written Bid Documents.

1.02 Related Sections

A. Section 01 45 16 – Testing Requirements.

1.03 References

A. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition (WisDOT).

1.04 Submittals

A. Preconstruction Submittals
   1. Submit mix design, meeting all necessary criteria for all mixtures to be used on the project. Conduct the mix design in accordance with WisDOT 460.

B. Construction Submittals:
   1. Submit density testing records.
   2. Submit truck weight slips.

1.05 Quality Assurance

A. Qualifications of Asphalt Producer: Use only materials which are furnished by a bulk asphalt concrete producer regularly engaged in the production of hot-mix, hot-laid asphalt concrete.

B. Qualifications of Testing Agency: Use only recognized commercial-testing laboratory experienced in testing asphalt concrete materials.

1.06 Job Conditions

A. Weather Limitations
   1. Asphalt concrete surface course material shall not be placed during the calendar period between November 1st and April 15th except with written approval of Engineer of a cold weather paving plan provided by the Contractor.
   2. Asphalt concrete material shall not be placed when air temperature is less than 36^0F as measured 3 feet above the ground in the shade and away from the effects of artificial heat.
   3. Asphalt concrete materials shall not be placed on frozen or excessively wet base course or when it is raining.

B. Traffic Control
   1. Maintain vehicular and pedestrian traffic during paving operations as required for other construction activities.
   2. Provide flagmen, barricades, warning signs and lights as needed to provide for safety and movement of traffic.

PART 2 - PRODUCTS

2.01 Asphaltic Mixture Design

A. Conduct the asphaltic mixture design in accordance with WisDOT Table 460-2. Mixture requirements are as follows:

Mixture Type	LT	MT
ESALs x 10^6 (20 yr design life)	< 2	2 to < 8
LA Wear (AASHTO T 96) 100 revolutions (max % loss) 500 revolutions (max % loss)	 13 50	 13 45
Soundness (AASHTO T 104) (sodium sulfate, max % loss)	12	12
Freeze/Thaw (AASHTO T 103) (specified counties, max % loss)	18	18
Fractured Faces (ASTM D5821) (one face/2 face, % by count)	65 / __	75 / 60
Thin or elongated (ASTM D4791) (max % by weight)	5 (5:1 ratio)	5 (5:1 ratio)
Fine Aggregate Angularity (AASHTO T 304, Method A, min)	40	43
Sand Equivalency (AASHTO T 176, min)	40	40
Gyratory Compaction Gyrations for N_{ini} Gyrations for N_{des} Gyrations for N_{max}	 6 40 60	 7 75 115
Air Voids, $\%V_a$	4. 0[6]	4. 0[6]
% G_{mm} @ N_{des}	96.0	96.0
% G_{mm} @ N_{ini}	≤91.5[1]	≤89.0[1]
% G_{mm} @ N_{max}	≤98.0	≤98.0
Dust to Binder Ratio[2] (% passing 0.075/P_{be})	0.6 - 1.2	0.6 - 1.2
Voids filled with Binder (VFB or VFA, %)	60 - 80 (4, 5)	65 - 75 (3, 4)
Tensile Strength Ratio - TSR (ASTM D4867) no antistripping agent with antistripping agent	 0.75 0.80	 0.75 0.80
Draindown at Production Temperature (%)	------	------

[1] The percent maximum density at initial compaction is only a guideline.
[2] For a gradation that passes below the boundaries of the caution zone (ref. AASHTO MP3), the dust to binder ratio limits are 0.6 - 1.6.
[3] For 9.5 mm and 12.5 mm nominal maximum size mixtures, the specified VFB range is 70 - 76%.
[4] For 25.0 mm nominal maximum size mixtures, the specified VFB lower limit is 67%.
[5] For 37.5 mm nominal maximum size mixtures, the specified VFB lower limit is 67%.
[6] Shall conform to current WisDOT ASP 6, 460.2.1, which includes the regression of air voids from 4.0% to 3.0% with asphalt cement.

2.02 Aggregate

A. Provide aggregate conforming to WisDOT Table 460-1. Aggregates shall consist of hard durable particles and shall not contain more than a combined total of one percent, by mass, of lumps of clay, loam, shale, soft particles, organic matter, adherent coatings, and other deleterious matter. The composite aggregates shall conform to the requirements of the Mixture Requirements Table and the Aggregate Gradation Table.

Aggregate Gradation Percent Passing By Weight				
Sieve Size	25.0 mm (#2)	19.0 mm (#3)	12.5 mm (#4)	9.5 mm (#5)
37.5 mm	100	- - -	- - -	- - -
25.0 mm	90 - 100	100	- - -	- - -
19.0 mm	90 max	90 - 100	100	- - -
12.5 mm	- - -	90 max	90 - 100	100
9.5 mm	- - -	- - -	90 max	90 - 100
4.75 mm	- - -	- - -	- - -	90 max
2.36 mm	19 - 45	23 - 49	28 - 58	20 - 65
75 um	1 - 7	2 - 8	2 - 10	2 - 10
% Min VMA	12.0	13.0	14.0	15.0

B. Unless otherwise designated in the contract, the nominal size of aggregate used in the mixture shall conform to the following:

Pavement Thickness	Aggregate Size	
	Binder	Surface
3”	12.5 mm	9.5 mm
3 1/2”	12.5 mm	12.5 mm
4”	19.0 mm	12.5 mm
4 1/2”	19.0 mm	12.5 mm
5”	19.0 mm	12.5 mm

2.03 Asphalt Cement

A. PG 58-28 S or H.

B. Tack Coat: Emulsified asphalt - Grade SS-1; WisDOT 455.2.5

2.04 Recycled Asphaltic Materials

A. Recycled Asphalt Shingles can be used as follows: 5-7% binder, 2% surface. WisDOT 460.2.5

2.05 Recovered Asphaltic Binders

A. WisDOT 460.2.6

PART 3 - EXECUTION

3.01 Lines and Grade

A. Lines and grade shall be as shown on the drawings or as given by the Engineer.

B. When curb & gutter is in place, the Contractor shall use the curb & gutter for line and grade. For streets without curb and gutter, the Engineer will provide grade stakes at a minimum distance of 50 feet along the centerline. Provide the Engineer with a minimum 48 hours’ notice of the need for grade stakes.

C. Parking lots will be staked as required.

3.02 Surface Preparation

A. Proof Roll
   1. Proof-roll prepared base surface using heavy rubber-tired roller or loaded tandem-axle dump truck under the observance of the Engineer. Aggregate surface shall not rut or displace significantly under the weight of the equipment. Soft or unstable areas that cannot be improved by additional compaction shall be undercut, replace with suitable fill material, and recompacted.
   2. Do not begin paving until necessary corrections are made.

B. Loose and Foreign Material
   1. Remove loose and foreign materials from compacted base or old surface course immediately before paving.
   2. Use power brooms or blowers and hand brooming as required.

C. Tack Coat (WisDOT 455.3.2.1)
   1. Dilute material with equal parts of water and apply to contact surfaces of previously constructed asphalt concrete or Portland cement concrete and similar surfaces.
   2. Apply at a rate of 0.05-0.07 gallons per square yard of surface with a power distributor.
   3. Apply only when air temperature is 36° F or higher.
   4. Apply tack coat by brush to contact surfaces of curbs, gutters, manholes and other structures projecting into or abutting asphalt concrete pavement.
   5. Apply tack coat between all layers. This work shall be incidental to the asphalt paving.

D. Existing Pavement Correction
   1. Fill potholes, sags and depressions.
   2. Material may be placed by hand.

3.03 Frame Adjustments

A. Prior to paving, set frames of subsurface structures to final grade. Covers shall be one-half inch below surface of adjacent pavement with the tops of manholes the same slope as the surrounding pavement.

3.04 Preparing the Mixture

A. Comply with applicable sections of WisDOT 450 for material storage, control, mixing and for plant equipment and operation.

3.05 Equipment

A. Provide size and quantity of equipment to complete the work specified within the project time schedule.

B. Paving shall be placed with a self-propelled spreading and finishing machine that spreads the hot-asphalt concrete mixture without tearing, shoving or gouging the surface and that controls pavement edges to true lines without use of stationary forms.

C. Rolling equipment shall be self-propelled steel-wheel rollers of the three-wheel, tandem or three-axle tandem type. Three-wheel and tandem rollers shall be rated at not less than 8 tons. Three-axle tandem rollers shall be rated at not less than 12 tons.

3.06 Placing the Mix

A. Do not place asphaltic mixture when the air temperature approximately three feet above grade, in shade, and away from artificial heat source is less than 36^0F.

B. Place asphalt concrete mixture on prepared surface, spread and strike off using paving machine.

C. Spread mixture at a temperature between 250^0F and 350^0F.

D. Inaccessible and small areas may be placed by hand.

E. Place each course at thickness so that when compacted, it will conform to the indicated grade cross section, finish thickness and density specified.

F. Compacted Thickness of Individual Layers:

Pavement Thickness	Layer Thickness	
	Binder	Surface
3”	1 1/2”	1 1/2”
3 1/2”	1 3/4”	1 3/4”
4”	2 1/4”	1 3/4”
4 1/2”	2 3/4”	1 3/4”

5”	3”	2”

G. Paver Placing
   1. Unless otherwise directed, begin placing along centerline of areas to be paved on crowned section and at high side of sections on one-way slope and in direction of traffic flow.
   2. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips.
   3. Complete binder course for a section before placing surface course.

H. Hand Placing
   1. Spread, tamp and finish mixture using hand tools in areas where machine spreading is not possible.
   2. Place mixture at a rate that will ensure handling and compaction before mixture becomes cooler than acceptable working temperature.

I. Joints
   1. Carefully make joints between old and new pavements or successive day's work to ensure a continuous bond between adjoining work.
   2. Clean contact surfaces free of sand, dirt or other objectionable material, and apply tack coat.
   3. Cut back edge of previously placed course to expose an even, vertical surface for full course thickness.

3.07 Compacting the Mix

A. While the mixture is still hot, compact thoroughly and uniformly by rolling. Provide sufficient number of rollers to obtain the required density and accomplish the rolling.

B. Begin rolling operations as soon after placing as the mixture will bear weight of roller without excessive displacement.

C. Do not permit heavy equipment, including rollers, to stand on finished surface before it has thoroughly cooled or set.

D. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.

E. Start rolling longitudinally at extreme lower side of sections and proceed toward center of pavement. Roll to slightly different lengths on alternate roller runs.

F. Do not roll centers of sections first.

G. Breakdown Rolling
   1. Accomplish breakdown or initial rolling immediately following rolling of transverse and longitudinal joints and outside edge.
   2. Check crown grade and smoothness after breakdown rolling.
   3. Repair displaced areas by loosening at once with lutes or rakes and filling, if required, with hot loose material before continuing rolling.

H. Second Rolling
   1. Follow breakdown rolling as soon as possible while mixture is hot and in condition for compaction.
   2. Continue second rolling until mixture has been thoroughly compacted.

I. Finish Rolling
   1. Perform finish rolling while mixture is still warm enough for removal of roller marks.
   2. Continue rolling until roller marks are eliminated and course has attained specified density.

3.08 Pavement Density

A. Pavements shall be built with the Maximum Density Method, WisDOT 460.3.3, unless otherwise specified.

B. Ordinary Compaction: Compact leveling, wedging, patching layers, driveways, and other non-traffic areas to the degree that no further appreciable consolidation is evidenced under the action of

the compaction equipment. Comply with WIDOT 450.3.2.6.

C. Maximum Density Method: All courses or layers thereof of plant mixed asphaltic mixtures for which the Maximum Density Method is used shall be compacted to a density not less than the percentage shown in the Table of Maximum Required Density, WisDOT Table 460-3, for the applicable mixture and course.

3.09 Pavement Density Determination

A. General
1. Density testing shall be performed by an independent testing firm, hired by the contractor or by a trained and qualified employee of the Contractor if approved by the Engineer. Densities may be determined on the basis of cored/sawed holes or nuclear methods.
2. Density determination will be made as soon as practical after placement and compaction and prior to placement of subsequent layers. Do not re-roll compacted mixtures represented by samples or tests having deficient densities. Do not operate below the specified maximum density on a continuing basis. Stop production until the source of the problem is determined and corrected.
3. A lot shall represent 1500 lineal feet of mixture, or the quantity placed in one day if less than 1500 lineal feet, for each density requirement. Densities of binder and surface course mixtures shall be determined on the basis of nuclear methods. Random testing locations will be established by the Engineer.

B. Tests: Five random tests will be taken on each lot. The lot density shall be the average of all samples taken.

C. Compact all layers to the percent of the target maximum density as shown in the following table.

Minimum Required Density (1)		
Location	Layer	% of Target Maximum Density Mixture Type LT and MT
Traffic Lanes (2)	Lower Upper	93.0 (3) 93.0
Shoulders and Appurtenances	Lower Upper	91.0 92.0

(1) The table values are for average lot density. If any individual test result falls more than 3% below the minimum required target maximum density, the engineer may investigate the acceptability of that material.
(2) Includes parking lanes as determined by engineer.
(3) Minimum reduced by 2% when the first lift of lower layer constructed on crushed aggregate or recycled base courses.

D. Density Deficiency: When the density of a lot of compacted binder or surface course is less than the specified minimum, payment will be adjusted in accordance with the following table:

Adjusted Payment Schedule	
Percent Lot Density Below Specified Minimum	Percent of Contract Price
From 0.5 to 1.0 inclusive	98
From 1.1 to 1.5 inclusive	95
From 1.6 to 2.0 inclusive	91
From 2.1 to 2.5 inclusive	85
From 2.6 to 3.0 inclusive	70
More than 3.0	*

* The lot shall be removed and replaced with a mixture at the specified density and, when acceptably replaced, will be paid for at the contract price; or the engineer may permit the unacceptable material to remain in place with a 50 percent reduction in payment.

3.10 Surface and Thickness Requirements

A. Surface Requirements
   1. Provide final surface of uniform texture conforming to required grade and cross-section.
   2. Test finished surface of each asphalt concrete course for smoothness using a 10-foot straightedge applied parallel to and at right angles to centerline of paved area.
   3. Check surface areas at intervals directed by Engineer.
      a. Binder course: 1/4 inch in 10 feet.
      b. Surface course: 1/4 inch in 10 feet.

B. Thickness Requirements
   1. If the Engineer believes that the thickness of the compacted base or surface course is not at the specified thickness, the Contractor may be required to obtain 4-inch diameter samples to verify the thickness. The samples shall be obtained by sawing or coring and all sample holes shall be repaired with fresh mix and compacted.
   2. If the thickness is not as specified it will be the Engineer's option to adjust the contract price, require an overlay, or require some other remedial action.

3.11 Patching

A. Remove and replace defective areas.
   1. Cut out and fill with fresh hot-asphalt concrete.
   2. Compact by rolling to specified density and surface smoothness.
   3. Remove deficient areas for full depth of course.
   4. Cut sides perpendicular and parallel to direction of traffic with edges vertical.
   5. Apply tack coat to exposed surfaces before placing new asphalt concrete mixture.

3.12 Cleaning and Protection

A. After final rolling, do not permit vehicular traffic on asphalt concrete pavement until it has cooled and hardened and, in no case, sooner than 6 hours.

B. Provide barricades and warning devices as required to protect pavement and the general public.

END OF SECTION

SECTION 32 13 13

CONCRETE SIDEWALK

PART 1 - GENERAL

1.01 Section Includes

A. Subgrade preparation.

B. Aggregate base course.

C. Furnishing, placement and finishing of concrete sidewalk, driveway and steps.

1.02 Related Sections

A. Section 03 31 01 – Sitework Concrete.

1.03 References

A. ASTM A185 - Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.

B. ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

C. ASTM A616 - Rail-Steel Deformed and Plain Bars for Concrete Reinforcement.

D. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

E. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds having Special Properties for Curing and Sealing.

F. ASTM D1557 - Test Method for Moisture-Density Relations of Soil and Soil-Aggregate Mixtures Using 10-lb. (4.5-kg) Rammer and 18-in. (457 mm) Drop.

G. ASTM D 1751 - Performed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

H. ASTM D 1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

I. ASTM D2487 - Classification of Soils for Engineering Purposes.

J. Wisconsin Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition (WisDOT).

1.04 Submittals

A. Concrete delivery tickets.

B. Manufacturer’s data and installation instructions for curing/sealing compound.

1.05 Weather Limitations

A. Cold Weather Placement
   1. Do not place concrete when air temperature is 40 degrees F and falling. Placement may commence when air temperature is 35 degrees F and rising.
   2. Insulate concrete to maintain a minimum temperature of 50 degrees F for not less than 72 hours and a temperature above freezing for the remainder of the curing period.
   3. The subgrade shall be free of frost.
   4. Water and aggregates may be heated prior to mixing so that the temperature of the in-place concrete is between 50 and 85 degrees F.

B. Warm Weather: Temperature of in-place concrete shall not exceed 85 degrees F except where an

approved retarder is used. In no case shall the in-place temperature exceed 95 degrees F.

C. Do not place during rain, sleet or snow.

1.06 Equipment

A. Equipment, machines and tools shall have the capability of producing the required product, meeting grade controls, thickness control and smoothness requirements.

B. Slip forming machines shall be self-propelled, automatically controlled, crawler mounted, and capable of spreading, consolidating and shaping the plastic concrete to the desired cross section in one pass.

PART 2 - PRODUCTS

2.01 Materials

A. Concrete: Class D, air entrained concrete. See Section 03 31 00 or 03 31 01 for concrete.

B. Reinforcing Steel: ASTM A615 or A616, Grade 60, deformed bars; ASTM A185 welded wire fabric.

C. Curing/Sealing Material:
1. An acrylic resin curing, sealing, and hardening compound for exterior freshly placed concrete that provides a durable, long-lasting moisture impermeable finish that improves resistance to chemicals, grease, and de-icing salts.
2. Meet requirements of ASTM C1315, Type 1, Class B and ASTM C309, Type 1, Classes A and B.
3. Manufacturer: AS-1 Achro Seal 1315 OTC, TK Products; Seal Cure 309-30, W.R. Meadows; or equal.

D. Preformed Expansion Joint Fillers: ASTM D1751 or ASTM D1752.

E. Crushed Aggregate Base: Provide crushed aggregate base meeting gradation requirements of WisDOT 305 as reproduced below:

	Percentage Passing By Weight	
Sieve Size	1 1/4-Inch Base	3/4-Inch Base
1 1/4-Inch	95 - 100	- - -
1-Inch	- - -	100
3/4-Inch	70 - 93	95 - 100
3/8-Inch	42 - 80	50 - 90
No. 4	25 - 63	35 - 70
No. 10	16 - 48	15 - 55
No. 40	8 - 28	10 - 35
No. 200	2 - 12	5 - 15

F. Common Fill: Natural soil free from organic matter, debris, vegetation, stones larger than six inches, and frozen material and classified as GW, GP, GM, GC, SW, SP, SC, ML or CL in ASTM D2487.

PART 3 - EXECUTION

3.01 Lines and Grade

A. Construct sidewalk to lines and grade shown on the Drawings or as given by the Engineer.

B. Engineer will provide grade stakes at 50-foot intervals on straight sections, at 25-foot intervals on curves, and at tangent points.

C. Inform Engineer at least 48 hours in advance of the need for grade stakes.

D. Use short vertical curves where change in grade exceeds two percent.

E. Normal cross slope is two percent towards the street.

F. Do not exceed a four percent longitudinal slope for a distance of two feet from the top and bottom of steps.

3.02 Subgrade Preparation

A. Excavate to required subgrade and compact to 95 percent of the maximum dry density in accordance with ASTM D1557.

B. Use common fill for areas needing fill. Place in maximum 8-inch compacted layers. Compact to 95 percent of the maximum dry density in accordance with ASTM D1557. Unless otherwise indicated on the Drawings, the top of the fill shall extend one foot beyond the edge of the walk.

3.03 Base

A. Place crushed aggregate base material on prepared subgrade to a minimum compacted thickness of three inches. Compact to 95 percent of the maximum dry density.

3.04 Forms

A. Wood or metal forms, straight, and of sufficient strength to resist placement during pouring. Wood forms shall be surfaced plank, 2-inch nominal thickness. Steel forms shall be channel-formed sections with a flat top surface. Forms shall be at least equal to the thickness of the concrete.

B. Clean and oil forms prior to use.

3.05 Placing and Finishing

A. Place concrete on moistened base material in one layer. Consolidate sufficiently to bring moisture to the surface and strike off. Placing, consolidating and striking may be by hand or with a slip forming machine.

B. Finish surface with a smooth wood float until the surface is true to grade and section and uniform in texture. Before mortar has set steel trowel the surface and brush troweled surface with a broom or brush transverse to the direction of traffic.

C. Do not remove forms until the concrete has been in place for at least 12 hours.

D. Edges of walk and edge of joints shall be rounded with a 1/4 inch radius edger.

E. Surface and edges shall be true and free from tool marks.

F. After forms are removed, paint honey-combed areas with mortar.

3.06 Contraction Joints

A. Provide transverse contraction joints at five foot intervals. If sidewalk is greater than 12 feet wide, provide a longitudinal joint at the midpoint.

B. Form joints by cutting the concrete not less than 1/4 of the depth with a pointed trowel or other suitable tool. Finish edges with a 1/4-inch radius tool. Joints shall have a minimum width of 1/8 inch and a minimum depth of 1 inch.

3.07 Expansion Joints

A. Form expansion joints with 1/2 inch thick preformed filler. Filler shall extend the full depth of the concrete with the top slightly lower than the concrete surface.

B. Place expansion joints at uniform intervals not exceeding 100 feet, between walk and abutting curb, between walk and driveway approaches, and between walk and buildings or other rigid structures.

3.08 Reinforcement

A. Install reinforcement when crossing sewer, water main, and lateral trenches and as indicated.

3.09 Steps

A. Construct steps in accordance with the Drawings or as directed by the Engineer.

B. Provide a rubbed finish on riser surfaces and sides of steps.

3.10 Handicap Ramps

A. Provide handicap ramps at all intersections. Provide handicap ramps at other locations, as indicated on the Drawings or as directed by the Engineer.

B. The ramp surface shall have one of the following detectable warning surfaces as shown on the Drawings or as directed by the Engineer:
   1. Provide Truncated Dome Panels: Neenah R-4984 DWP 2'x4'.
   2. Provide plastic truncated dome tiles in accordance with Section 32 17 26 when indicated on the Drawings.

3.11 Curing and Protection

A. Cure and seal concrete with a uniform coating of membrane curing/sealing compound.

B. Apply with sprayer in accordance with the manufacturer's printed instructions.

C. Apply two coats at right angles to each other.

D. Do not apply if the temperature of the concrete is less than 40^0F.

E. Protect concrete from all traffic for three days and from vehicular traffic for seven days.

3.12 Defects

A. If sidewalk cracks between contraction joints, settles, or spalls within one year of placement, the Engineer may require the defective concrete to be removed and replaced at no expense to Owner.

B. Full blocks from joint to joint shall be removed.

END OF SECTION

SECTION 32 17 23.14

PAVEMENT MARKING

PART 1 - GENERAL

1.01 Section Includes

A. Traffic control markings for pavement.

1.02 References

A. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition (WisDOT).

PART 2 - PRODUCTS

2.01 Paint

A. A fast-drying, waterborne paint formulated for traffic markings meeting the requirements of WisDOT 646.

2.02 Line Types

A. Line types shall have the width and color as follows:
   1. Centerline: 4-inch, yellow, solid.
   2. No Passing: 4-inch, yellow, dashed.
   2. Lane Line: 4-inch, white, solid.
   3. Edge Line: 4-inch, white, solid.
   4. Stop Line: 12-inch, white, solid.
   5. Crosswalk: 6-inch, white, solid.
   6. Parking Stalls: 4-inch, white, solid.

PART 3 - EXECUTION

3.01 Preparation

A. Pavement shall be dry and free from frost.

B. Remove dust, dirt, glaze, oil, grease, loose paint, gravel, debris or other materials that may prevent proper bonding.

C. Accurately layout the markings.

3.02 Application

A. Do not apply below the minimum pavement temperature recommended by the manufacturer.

B. Place markings as indicated on the Drawings or as directed by the Engineer.

C. Applied lines shall have a uniform width.

D. Applied lines and symbols shall have a uniform color. Edges of lines and symbols shall have a reasonably sharp cutoff.

E. Apply paint at a rate of 17.6 gallons per mile of 4-inch wide line.

3.03 Protection

A. Protect painted markings from traffic until paint is sufficiently dry to preclude pickup under traffic.

END OF SECTION

SECTION 32 32 23.14

BOULDER RETAINING WALLS

PART 1 - GENERAL

1.01 Section Includes

A. Furnishing and installation of boulder retaining wall.

1.02 Submittals

A. If requested by Owner, provide a sample of the boulders to be provided.

PART 2 - PRODUCTS

2.01 Materials

A. Boulders: Fieldstone boulders generally spherical in shape with a diameter from 18 inches to 48 inches.

B. Geotextile: A nonwoven fabric consisting of polypropylene, polyethylene, or polyamide. Fabric shall be resistant to insects, rodents, mildew and rot, and protected from UV degradation. the fabric shall meet the following minimum values:

Property	Test Method	Requirement
Grab tensile strength, lbs min.	ASTM D4632	180
Elongation, percent min.	ASTM D4632	50
Trapezoidal tear strength, psi	ASTM D4533	75
Mullen burst strength, psi	ASTM D3786	350
Puncture strength, lbs	ASTM D4833	105
Apparent opening size, US Sieve	ASTM D 4751	70-100

C. Crushed Aggregate: Crushed stone or crushed gravel meeting the following gradation:

Sieve Size	Percent Passing by Weight
1 1/4-Inch	95 - 100
1-Inch	- - -
3/4-Inch	70 - 90
3/8-Inch	45 - 75
No. 4	30 - 60
No. 10	20 - 40
No. 40	7 - 25
No. 200	2 - 12

D. Drainage Stone: Clean crushed stone or crushed gravel meeting the following gradation:

Sieve Size	Percent Passing by Weight
1-Inch	100
3/4-Inch	75 - 100
No. 4	0 - 60
No. 40	0 - 50
No. 200	0 - 5

PART 3 - EXECUTION

3.01 Foundation Preparation

A. Excavate to the lines and grades shown on the Drawings or as given by the Engineer.

B. Test foundation to determine if there are any soft spots. Remove soft foundation material and replace with compacted crushed stone.

3.02 Installation

A. Place geotextile between boulders and drainage stone as shown on the Drawings.

B. Place boulder according to size with largest boulders on bottom as first course. Place subsequent boulders vertically according to relative size with the smallest boulders as the last course on top

C. Place first course on the prepared foundation at the appropriate line and grade. The bottom of the first course shall be at a minimum depth below finish grade of one-half the boulder height. All boulders shall be in full contact with the foundation material.

D. Place the boulders tight together in a well-keyed mass. Stagger vertical joints.

E. Place drain tile at the base of the wall slightly above the finish grade at the base as shown on the Drawings. Discharge the drain tile at maximum intervals of 50 feet.

F. Place drainage stone behind the wall.

G. Place backfill behind the wall in maximum 12-inch lifts, compacting each lift.

3.03 Measurement and Payment

A. Payment will be made at the contract unit price per square foot or by the lump sum as indicated in the Contract Documents and shall include all labor, materials, and equipment necessary to construct boulder retaining wall including excavation, foundation preparation, drain tile, geotextile, drainage stone, backfilling, and compaction, and boulders from top of wall to finished grade (exposed face of wall).

B. If additional boulders are required at the base to provide stability of the wall, the additional height of wall will be paid for at the contract unit price per square foot if payment is on a unit price basis or payment will be negotiated if payment is on a lump sum basis. Additional depth of wall shall be approved by the Engineer prior to installation.

END OF SECTION

SECTION 32 92 19

SOIL PREPARATION AND SEEDING

PART 1 - GENERAL

1.01 Section Includes

A. Preparation of subsoil.

B. Placing topsoil.

C. Fertilizer.

D. Seeding.

E. Mulching.

1.02 Quality Assurance

A. Comply with requirements of state regulations regarding grass seed and fertilizer.

B. Fertilizer
   1. Each container shall be plainly marked with the analysis of the contents showing the minimum percentages of total nitrogen, available phosphorous and soluble potash. Containers or packages shall be new and unopened.
   2. When furnished in bulk, each shipment shall be accompanied by an invoice indicating minimum percentages of the contents listed above.

C. Seed
   1. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging and location of packaging. Containers or packages shall be new and unopened.
   2. Seed shall not be used later than one year later than the test date appearing on the label.
   3. Sampling and testing of seed for purity, germination and weed seed content shall be in accordance with "Rules for Testing Seed" published by the Association of Official Seed Analysts.

1.03 Submittals

A. Submit composition of fertilizer and seed mixture.

B. Submit, upon request, manufacturer's certification that materials meet specification requirements.

C. Submit, upon request, results of seed purity and germination tests.

D. Submit topsoil test results for all topsoil borrow.

PART 2 - PRODUCTS

2.01 Topsoil

A. Provide reclaimed topsoil from the site unless the contract documents require topsoil borrow.

B. Reclaimed Topsoil: Topsoil stripped from the site consisting of loam, sandy loam, silt loam, or silty-clay loam, or clay loam, humus-bearing soil, adapted to sustaining plant life. The soil shall be free of subsoil, foreign matter, plant material, objects larger than one inch in any dimension, and toxic or other substances harmful to plant growth.

C. Topsoil Borrow: Topsoil from offsite consisting of natural loam, sandy loam, silt loam, or silty-clay loam, or clay loam, humus-bearing soil, adapted to sustaining plant life. The soil shall be free of subsoil, foreign matter, plant material, objects larger than one inch in any dimension, and toxic or other substances harmful to plant growth. The soil shall have a pH range of 5.5 to 8.0 and a

maximum soluble salt level of 500 PPM. Topsoil originating from agricultural fields shall be free of residual herbicide and other contaminants.

2.02 Fertilizer

A. Standard commercial fertilizer with the following available nutrients by weight:
   1. Nitrogen - not less than 10%.
   2. Phosphoric Acid - not less than 10%
   3. Potash - not less than 10%

2.03 Seed

A. Seed mixtures shall be Olds Seeds or equal of grass species and varieties, proportions by weight, and minimum percentages of purity and germination as indicated in the following schedule.

Species	Purity Min. %	Germination Min. %	Quick-2-Gro	Survivor	Boulevard	Wear-n-Tear
Kentucky Bluegrass	98	85	25	15		50
Creeping Red Fescue	97	85	25	30	25	10
Turf Type Tall Fescue	98	85		40	25	
Fine Fescue	97	85				
Dawson Red Fescue	97	85				
Perennial Ryegrass	97	85	25	15	25	40
Annual Ryegrass	97	90	25			
Alkaligrass	98	85			25	

Unless otherwise provided in the Contract Documents, the selection of seed mixtures shall be as follows:

1. Quick-2-Gro: Use for general seeding within new subdivisions.
2. Survivor: Use for seeding lawns where soils are light and sandy.
3. Wear-n-Tear: Use for seeding lawns where soils are loam or clay.
4. Boulevard: Use for boulevard areas behind curb to sidewalk or ROW, from shoulder to ROW on rural section roads, and street or parking lot islands.

2.04 Mulch Materials

A. Hay: Straw or hay in air-dry condition substantially free from noxious weed seeds or objectionable foreign matter.

B. Paper Fiber: Mulch consisting of recycled newsprint fibers, wetting agent, deforming agent and green dye with a dry moisture content of 9 to 15 percent.

C. Wood Cellulose: Wood cellulose fibers manufactured from virgin wood fibers that form a blotter-like ground cover that readily absorbs water and allows infiltration to the underlying soil. Moisture content shall not exceed 15 percent at the time of delivery. The mulch shall be dyed green and shall have the property of becoming dispersed and suspended when agitated in water.

D. Erosion Control Revegetative Mat: A light duty, organic, non-netted mat with a minimum thickness of 3/8 inch and biodegradable yarn or glue on 12 inch maximum centers in the longitudinal direction. The mat shall be capable of withstanding moderate foot traffic without tearing or puncturing. Acceptable products are those listed in the Wisconsin Department of Transportation, Erosion Control Product Acceptability Lists for Class I, Type Urban mats. Anchoring devices shall be biodegradable, non-splintering and shall last for at least two months and shall substantially degrade in four months.

2.05 Tackifiers

A. Latex-Base: A latex emulsion polymer with a composition by weight of 48 percent styrene, 50 percent butadiene and 2 percent additive; 42 to 46 percent solids; and a pH of 8.5 to 10.

B. Guar Gum: Guar gum tackifiers consisting of a minimum of 95 percent Guar gum by weight with

the remaining consisting of dispersing and cross-linking additives.

C. Other: Water soluble natural vegetable gums or guar gums blended with gelling and hardening agents or a water soluble blend of hydrophilic polymers, viscosifiers, sticking aids and other gums.

PART 3 - EXECUTION

3.01 Inspection

A. Examine area to receive soil preparation to ensure subsoil is ready for finish grading.

B. Do not proceed with soil preparation until unsatisfactory conditions are corrected.

3.02 Preparation of Subsoil

A. Eliminate uneven areas or low spots. Make changes in gradual and blend slopes into level areas.

B. Do not prepare or place frozen soils or soils with excessive moisture.

C. Remove weeds, roots, trash, debris, concrete, asphalt, crushed aggregate, and any stones larger than two inches in any dimension.

D. Scarify subsoil to a depth of three inches.

3.03 Placing of Topsoil

A. Spread topsoil evenly to a compacted depth of four inches.

B. Place during dry weather.

C. Grade to eliminate rough or low areas and to ensure positive drainage. Grading shall be approved by the Engineer.

D. Remove stones and other objects larger than one inch in any dimension.

3.04 Fertilizing

A. Apply fertilizer at a rate of seven pounds per 1000 square feet.

B. Apply fertilizer uniformly, incorporating it into the soil by light disking or harrowing.

C. Apply fertilizer prior to seeding.

3.05 Seeding

A. Do not sow seed on frozen soil or when wind exceeds 5 MPH.

B. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.

C. Seeding Dates:
1. Spring/Summer: April 1 to August 14.
2. Fall: August 15 to October 1.

D. Application Rate:

Application Rate

Mixture	Lbs/1000 Sq. Ft.
Quick-2-Gro	5 - 6
Survivor	5 - 6
Wear-n-Tear	4 - 5
Boulevard	5 - 6

E. Broadcasting
1. Sow seed evenly with a spreader or seeding machine.
2. Do not broadcast or drop seed when wind velocity exceeds 5 MPH.

3. Broadcast one half of seed.
4. Broadcast remaining half of seed at right angles to first seed pattern.
5. Cover seed to a depth of 1/4" by raking, dragging or cultipacting.
6. Roll seeded area with roller weighing a maximum of 150 pounds per foot of roller width.
7. Water seeded area with fine spray, if required, to promote growth.

F. Drilling
1. Drill seed following elevation contours.
2. Seed to uniform depth.
3. Roll seeded area with roller weighing a maximum of 150 pounds per foot of roller width.
4. Water seeded area with fine spray, if required, to promote growth.

3.06 Mulching

A. Place mulch on same day that the area is seeded.

B. Do not place straw or hay mulch or sprayed-on mulches during periods of high wind.

C. Mulch type and method is the Contractor's option unless a specific type or method is indicated on the Drawings or in the Contract Documents.

D. Hay/Straw Mulch
1. Method 1 - Spread straw or hay treated with a tackifier over the area using a blowing machine. Spread the material uniformly to a depth of 1/2 to 1 inch using 1 1/2 to 3 tons of material per acre. The amount of tackifier used shall be in accordance with the manufacturer's recommendations.
2. Method 2 - Spread hay or straw over the area by hand or using a blowing machine. Spread the material uniformly to a depth of 1/2 to 1 1/2 inch using 1 1/2 to 3 tons of material per acre. Immediately after spreading, anchor the mulch into the soil using a mulch tiller.

E. Paper Fiber: Apply with hydraulic spray equipment in a water slurry at the rate necessary to provide a 1/4 inch layer. Use the color of the material as a metering agent. Take care not to spray material on adjacent surfaces.

F. Wood Cellulose: Apply with hydraulic spray equipment in a water slurry at the rate of 1500 pounds per acre. Use the color of the material as a metering agent. Take care not to spray material on adjacent surfaces.

G. Mat: Remove all clods, stones or other materials that could damage the mat. Place mat over seeded area without overlapping. Anchor mat in accordance with the manufacturer's recommendations.

3.07 Establishment

A. Establishment Period:
1. For areas seeded during the spring or summer planting season the establishment period shall be 90 days.
2. For areas seeded during the fall planting season the establishment period shall be through June 1 of the following year.

B. Acceptable Establishment: At the end of the establishment period the grass shall be healthy, uniform in density and color, and substantially free of weeds with uniform coverage of at least 70 percent of a representative one square yard plot and bare spots not exceeding 6 inches by 6 inches.

C. Re-seed areas that fail to grow an acceptable stand of grass.

3.08 Protection

A. Protect all seeded areas, as necessary, to prevent trampling and/or damage by erecting temporary fences, barriers, signs, etc.

END OF SECTION

SECTION 32 93 00

TREES, SHRUBS, AND GROUND COVER

PART 1- GENERAL

1.01 Section Includes

A. Preparation of subsoil and topsoil.

B. Furnishing and planting of trees, shrubs and plants.

C. Mulches and accessories.

1.02 References

A. American Association of Nurserymen, Inc. - American Standard for Nursery Stock.

B. American Joint Committee on Horticultural Nomenclature - Standardized Plant Names.

C. National Arborist Association (NAA) - Pruning Standards for Shade Trees.

1.03 Quality Assurance

A. Contractor shall assume responsibility for all certificates of inspection of plant materials required by Federal, State or other authorities.

B. All plant material shall be subject to final approval by the Owner's representative on the site before installation.

C. Quality of and size shall be number one grade nursery stock in accordance with the American Standard for Nursery Stock.

D. All plants shall be true to name. Botanical names shall take precedence over common names.

E. Planting foreman shall have previously and successively completed landscaping work similar in design, material, and extent, to the Work required by the Contract Documents.

1.04 Submittals

A. Complete list of plants and plant materials to be provided. Identify plants as they are identified in the plant schedule. Provide brand name and description of planting materials.

B. Certificate of Inspection of plant material by State or Federal authorities if requested.

C. Maintenance Instruction: Contractor shall furnish written maintenance instructions to Owner for maintenance and care of plantings through their full growing season.

D. Provide samples of the following materials:
   1. Edging.
   2. Accessory materials to verify color selected.

E. Planting schedule indicating anticipated dates and locations for each type of planting.

1.05 Product Delivery, Storage and Handling

A. Provide freshly dug trees and shrubs. Do not prune prior to delivery. Do not bend or bind in such a manner as to damage bark, break branches or destroy natural shape of the trees and shrubs.

B. Digging Seasons
   1. Deciduous Trees and Shrubs: March 1st through June 1st and August 15th through November 1st.
   2. Evergreen Trees and Shrubs: March 1st through June 1st and September 1st through

November 1st
3. Special conditions may warrant a variance from the digging season dates; approval by the Engineer is required.

C. Preparation for Delivery
1. Bare Root (BR) Plants
   a. Dig with entire root system intact but with earth carefully removed.
   b. Cover roots with thick coating of mud by puddling after plants are dug.
2. Balled and Burlapped (B&B) Plants
   a. Dig and prepare for shipment in manner that will not damage roots, branches, shape and future development after planting.
   b. Ball with firm, natural balls of soil.
   c. Wrap ball firmly with burlap or strong cloth.
4. Specimen Plants: Exercise care in digging, wrapping and binding of such specimens to ensure safe loading, shipment and handling.
5. In hot weather, maintain stock in shade house for minimum of one week to allow plants to recover from digging shock.

D. Delivery
1. Deliver fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark and conformance to State law.
2. Do not deliver more plant materials than can be planted in one day.
3. Deliver plants with legible identification labels.
   a. Label trees, evergreens, and bundles of containers or ground cover plants.
   b. State correct plant name and size indicated on Plant List.
   c. Use durable waterproof labels with water-resistant ink, which will remain legible for 60 days.
4. Protect during delivery to prevent damage to root balls of desiccation of leaves.
5. Notify Engineer in advance so plant material may be inspected upon arrival at job site.
6. Remove unacceptable plant material immediately from job site.

E. Storage
1. Protect root ball of plant material from drying or other possible injury by covering with wood chip mulch or other approved method of keeping moist.
2. If planting is delayed more than five hours after delivery, set plants in shade and provide protection from weather and mechanical damage.
3. Heel-in bare-root stock. Soak roots in water for two hours, if dried out.
4. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
5. Do not remove container grown stock from containers before time of planting.
6. Water root systems of trees and shrubs stored on site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

F. Handling
1. Do not drop trees, shrubs, or other plant products, before or during delivery or while being handled at the project site.
2. Handle balled and burlapped stock by the root ball only. Do not pick up container or balled plants by stem or roots.

1.06 Planting Season

A. Perform actual planting only when weather and soil conditions are suitable in accordance with locally accepted practice.

1.07 Warranty

A. Warrant all trees, shrubs, and woody ground cover for a period of one year after date of installation, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, abuse by Owner, vandalism, or incidents that are beyond the Contractor’s control.

B. Perennial plants shall have a warranty of six months, under the same conditions as trees, shrubs, and woody ground covers. Annual plants shall have a warranty of three months.

C. Remove and replace dead or unsatisfactory plant materials immediately, unless required to plant in the succeeding planting season. Replacement plants shall have the same warranty as original plants commencing on the date of replacement.

D. Repair damage to other plants or lawns during plant replacement at no cost to Owner.

PART 2 - PRODUCTS

2.01 Trees and Shrubs

A. Provide healthy, vigorous stock, well formed and shaped, true to type and free of disease, insects, eggs, larvae and defects such as:
1. Injuries and abrasions
2. Disfigurement.
3. Dried-out roots.
4. Prematurely opened buds.
5. Thin or poor tops or root systems.
6. Sun scald or windburn.
7. Evidence of molding.
8. Dry, loose or broken ball of earth of B&B stock.
9. Dried-out or damaged soil mass in container stock.

B. Provide sizes as specified. Trees and shrubs of larger size may be provided if acceptable to Engineer.

C. Trees and shrubs shall be grown in a recognized nursery, unless specifically authorized to be collected.
1. Grown under climatic conditions similar to those in locality of project.
2. Container Grown Stock
   a. Grown in container for minimum of 120 days before delivery.
   b. Not root-bound or with root system hardened off.
3. Bare Root Stock: Roots well branched and fibrous.
4. Use only ground cover plants well established in removable containers, integral containers or formed homogeneous soil sections.

2.02 Topsoil

A. Provide topsoil that is fertile, friable, typical for the locality, capable of sustaining vigorous plant growth and free of subsoil, stones, clay or other impurities, plants, weeds, brush, stumps, and other litter, and roots, with a pH of 5.4 to 7.0.

2.03 Fertilizer

A. Slow release tablets or packets with minimum rating of 14-3-3 and 45 I.B.D.U. as manufactured by Ace Wood or equal.

2.04 Mulch

A. Shredded hardwood bark of uniform size, free of clumps, or mulch material(s) indicated on the Drawings.

2.05 Accessories

A. Decorative Cover: Inert ground cover materials shall be provided as shown on the Drawings. Material shall be free of deleterious material.

B. Weed Barrier Fabric: A pervious weed barrier fabric, DeWitt Co., Pro-5 or equivalent.

C. Upright and Guy Stakes: Sound, new hardwood, redwood, or pressure treated softwood, free of knots, holes, cross grain, and other defects, 2 x 2 inches, pointed at one end.

D. Cable, Wire and Eye Bolts: Non-corrosive, of sufficient strength to withstand wind pressure and resulting movement of tree.

E. Plant Protectors: New or used 2-ply reinforced rubber, 3/4" minimum size.

F. Wrapping: 4-inch wide two-ply waterproof crepe tree wrapping paper laminated with a layer of pliable asphalt material

G. Edging: Polyethylene bed divider, Valley View “Black Diamond” or equal or other edging indicated on the Drawings.

PART 3 - EXECUTION

3.01 Planting Bed Preparation

A. Prepare subsoil to eliminate uneven areas. Scarify subsoil to a depth of three inches.

B. For perennial planting beds, mix soil with soil amendments and fertilizers at rates needed for sustainable plant growth. Remove existing soil, if it is not conducive for plant growth, to a minimum depth of eight inches and replace with prepared planting soil mixture to a minimum depth of eight inches.

C. Remove vegetable matter and stones and foreign objects over one inch in any dimension.

3.02 Preparation

A. Locate plants as shown on drawings or as approved in field by the Owner's representative. If obstructions are encountered that are not shown on the drawings, do not proceed with planting operations until alternate plant locations have been selected or approved in writing by the Owner's representative. Where location or spacing dimensions are not clear on the drawings, request clarification by the Owner's representative.

B. Stake out locations for plants and outline of planting beds on the ground.

C. Do not begin excavation until stake-out of plant locations and plant beds is acceptable to the Owner's representative.

3.03 Planting

A. Excavate planting pit with vertical sides and with a bottom of excavation slightly raised at center to assist drainage. Excavate planting pit no deeper, at center, than the level on which the root ball or roots will set and approximately three times as wide as the rootball diameter.

B. Setting Plant
1. Set plant so that ground line is same as at the nursery.
2. Center and plumb plant; hold firmly until soil is firmly tamped around ball or roots.
3. Backfill to approximately 2/3 full settling each layer of soil with water. After soil settles, fill to surface with planting soil and water.
4. For B&B stock, remove binding at top of ball and lay top of burlap back 6".
5. For BR stock, spread out roots and carefully work planting soil among roots.
6. Apply plant fertilizer in accordance with manufacturer’s recommendations.

C. Weed Barrier and Mulch

1. Place weed barrier in all shrub and tree planting beds. Overlap adjacent edges.
2. Install hardwood bark mulch evenly over the entire planting bed to a depth of three inches. Install other mulches as indicated on the Drawings.
3. Where trees are located independently in lawn areas, provide a 4-foot diameter, 3-inch deep mulch bed around each tree. Do not install weed barrier fabric or edging material around independent tree mulch beds.
4. Do not install weed barrier fabric in perennial or annual planting beds.

C. Ground Cover: Install ground cover as shown on plans.

D. Tree Wrap: Wrap deciduous trees with spirally from bottom to first branched knuckle overlapping 1-1/2"; tie wrapping securely in place. Remove wrap in spring, no later than May 1st.

3.04 Plant Support

A. Do not stake trees unless they are subject to windy conditions.

B. If staking is necessary, stake as follows:

Tree Caliper	Staking Method
1 Inch	1 stake with tie
1 - 2 Inches	2 stakes with 2 ties
2 - 4 Inches	3 guy wires
Over 4 Inches	4 guy wires

C. Remove stakes after one year.

3.05 Pruning

A. Do not prune trees or shrubs, unless necessary to retain the plant's natural form and to remove dead and broken branches. Prune trees in accordance with NAA guidelines. Prune shrubs according to standard horticultural practice.

3.06 Cleanup

A. Dispose of excess soil.

B. Remove all cuttings and waste material.

END OF SECTION

SECTION 33 11 13

WATER MAIN CONSTRUCTION

PART 1 - GENERAL

1.01 Section Includes

A. Furnishing and installation of water main, valves, and hydrants.

B. Furnishing and installation of service laterals.

1.02 Related Sections

A. Section 01 45 16 – Testing Requirements.

B. Section 31 23 33 - Utility Excavation, Backfilling and Compaction.

C. Section 33 05 26 - Tracer Wire.

1.03 References

A. ASTM B88 - Seamless Copper Water Tube.

B. ASTM D2487 - Classification of Soils for Engineering Purposes.

C. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

D. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3-inch through 48-inch (75 mm through 1200 mm) for Water and Other Liquids.

E. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.

F. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast, for Water.

G. AWWA C153 - Ductile-Iron Compact Fillings, 3 In. Through 24 In. (76 mm through 610 mm) and 54 In. Through 64 In. (1400 mm through 1600 mm) for Water Service.

H. AWWA C502 - Dry-Barrel Fire Hydrants.

I. AWWA C515 - Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service.

J. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.

K. AWWA C605 - Underground Installation of Polyvinyl Chloride (PVC) Pressure pipe and Fittings for Water.

L. AWWA C651 - Disinfecting Water Mains.

M. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe 4-inch through 12-inch, for Water Distribution.

1.04 Submittals

A. Product data on pipe, fittings, valves, and hydrants.

B. As built measurements.

1.05 Quality Assurance

A. Provide at least one person thoroughly trained and experienced in the skills required, who is completely familiar with the work described in this section, and who shall be present at all times during progress of the work of this section and who shall direct all work performed under this section.

B. All materials shall be installed per the manufacturer's instructions and recommendations.

C. All materials shall be new and free from defects. Each length of pipe shall be clearly marked with the manufacturer's name, type of pipe, and the class of pipe.

D. Hydrostatic pressure testing and electrical conductivity testing required.

E. Disinfection and bacteriological sampling required.

PART 2 - PRODUCTS

2.01 Pipe Materials

A. Ductile Iron Pipe:
   1. Pipe: AWWA C151, Class 52; cement-mortar lining, AWWA C104.
   2. Joints: Mechanical joint or push-on, AWWA C111.
   3. Electrical Conductivity: Factory applied terminals with copper straps or cables capable of carrying 600 amps.

B. PVC Pipe (Use only when indicated on Drawings)
   1. Pipe: AWWA C900, Class 150 (DR-18) with cast iron O.D.
   2. Joints: Rubber gasket.

2.02 Fittings

A. Ductile Iron, AWWA C110 or AWWA C153. Compact fittings shall be of domestic manufacturers only.

B. Mechanical Joint Restraint:
   1. Ductile iron mechanical joint restraining gland.
   2. Ductile Iron Pipe: MEGALUG 1100 or equal.
   3. PVC Pipe: MEGALUG 2000PV or equal.

2.03 Gate Valves

A. Acceptable Manufacturers: Kennedy, Model KS-RW; American Flow Control, Series 2500; or equal.

B. Gate Valves:
   1. Resilient seated, ductile iron.
   2. AWWA C515, 250 psi working pressure.

C. Valve Construction
   1. Meet appropriate AWWA specification.
   2. All internal ferrous surfaces shall be epoxy coated. The exterior of buried valves shall be coated with epoxy.
   3. Valves to be field painted shall have all cast iron surfaces coated with primer.
   4. Joints: Flange joints, ANSI 16.1, Class 125; mechanical joints, AWWA C111.
   5. Valves shall be non-rising stem with square stem operating nut for socket wrench operation.
   6. All valves shall be opened by turning left.

D. Valve Box
   1. Valve Box: Cast iron 3-piece box with screw type adjustment. The word "WATER" shall be cast into box cover.
   2. Valve Box Centering Device:
      a. A valve box centering device that sets on the valve and is constructed of polyurethane coated steel with a rubber gasket between the device and the valve; Adapter, Inc. or equal.
      b. A factory attached valve box centering device consisting of stainless steel clips, American Flow Control Tenor Valve Box Centering Device or equal.

E. Alternate Valve Box (Use if indicated in Contract Documents)
   1. Complete assembly composed of the valve box and extension stem. The valve box top shall

be cast iron and the upper and lower pipes may be cast iron or high density polyethylene. The box assembly shall be adjustable.
2. The stem assembly shall be of a telescoping design that allows for variable adjustment length. The design shall include a means to prevent the stem assembly from disengaging when fully extended. The extension stem shall survive a torque test of 1,000 ft-lb without failure.
3. Manufacturer: American Flow Control Trench Adapter or equal.

2.04 Fire Hydrants

A. Hydrant: Dry-barrel type, AWWA C502; Waterous Pacer Model WB-67 with a 16" upper barrel section, unless a specific manufacturer is indicated elsewhere in the Contract Documents.

B. Design
1. Traffic model type equipped with a barrel ground-line flanged coupling and main rod coupling designed to fail completely and uniformly when the hydrant is impacted by a motor vehicle. Weakened steel or weakened cast iron bolts used in breakable barrel couplings are not acceptable.
2. Designed for working pressure of 150 psi.
3. Main valve shall open against system pressure and shall be not less than 5 1/4-inch.
4. No excavation shall be required to remove main valve and movable parts of main valve.
5. Drain port.
6. Bury length of 7.5 feet from bottom of connecting pipe to ground line.
7. Mechanical joint inlet connection.
8. Open by turning counterclockwise.
9. Outlets: Two 2-1/2-inch hose nozzles, one 4-1/2-inch pumper nozzle with National Standard threads and caps with chains.
10. Pentagonal operating nuts.

C. Paint: Red, unless indicated otherwise. Paint in accordance with AWWA C502, Section 4.2.

2.05 Tapping Sleeve

A. Tapping Sleeve: Carbon steel, epoxy coated, mechanical joint.

B. Manufacturer: Smith-Blair 622, Dresser 610, or equal.

2.06 Service Lateral

A. Pipe: Copper, ASTM B88, Type K.

2.07 Corporation Stops

A. Brass corporation stop with taper thread inlet and conductive compression outlet.
1. ¾" and 1": Mueller Ground Key Corporation Valve, H-15008 or equal.
2. 1 ½" and 2": Mueller Ori-Corp H-15013 or equal.

2.08 Curb Stops

A. Brass curb stop with conductive compression inlet and outlet, quarter turn check, and Minneapolis top.
1. ¾" and 1": Mueller Mark II Oriseal H-15155 or equal.
2. 1 ½" and 2": Mueller 300 Ball Curb Valve B-25155 or equal.

2.09 Curb Box

A. Cast iron extension type, Minneapolis pattern with stationary rod, 1 ¼" upper section, 7-foot length, pentagon nut.

B. Mueller H-10300 or equal.

2.09 Service Saddles

A. Ductile Iron Pipe: Double strap, epoxy-coated ductile iron with stainless steel straps; Smith-Blair

317 or equal.

B. PVC Pipe: Stainless steel, single or double bolt; Smith-Blair 371, 372 or equal.

2.10 Bedding and Cover Material

A. Provide bedding and cover material meeting the requirements of ASTM D2321, Class IA, IB, II or III described as follows:

1. Class IA - Clean angular crushed stone, crushed rock, or crushed gravel conforming to the following gradation:

Sieve Size	% Passing By Weight
1”	100
3/4”	90 - 100
3/8”	20 -55
No. 4	0 - 10
No. 8	0 - 5

2. Class IB - Clean angular crushed stone, crushed rock, or crushed gravel conforming to the following gradation:

Sieve Size	% Passing By Weight
1/2”	100
3/8”	85 - 100
No. 4	10 - 30
No. 200	0 - 5

3. Class II - Clean coarse-grained soils free from organic matter, trash, debris, stones larger than 1-inch, and frozen material and classified in ASTM D2487 as follows:

GW - Well-graded gravels, gravel-sand mixtures, little or no fines.
GP - Poorly-graded gravels, gravel-sand mixtures, little or no fines.
SW - Well-graded sands, gravelly sands, little or no fines.
SP - Poorly-graded sands, gravelly sands, little or no fines.

Excavated trench material may be used if it meets the above material requirements.

4. Class III - Coarse-grained soils with fines free from organic matter, trash, debris, stones larger than 1-inch, and frozen material and classified in ASTM D2487 as follows:

GM - Silty gravels, gravel-sand-silt mixtures.
GC - Clayey gravels, gravel-sand-clay mixtures.
SM - Silty sands, sand-silt mixture.
SC - Clayey sands, sand-clay mixtures.

Excavated trench material may be used if it meets the above material requirements.

PART 3 - EXECUTION

3.01 Handling of Materials

A. Handle all material with care to avoid damage. No material shall be dropped.

B. Remove all defective material from the job site.

C. Store materials in a manner that protects them from damage. Store hydrants and valves in a manner that provides protection from damage by freezing.

3.02 Lines and Grade

A. Lay pipe to the lines and grades shown on the Drawings or given by the Owner’s Representative.

3.03 Locate all fittings, valves, and hydrants as shown on the Drawings or as given by the Owner's Representative.

3.04 Laying Pipe

A. Unless otherwise indicated on the plans, all water mains, including hydrant leads, shall have a minimum depth of cover of 7.0 feet.

B. Handle pipe, fittings, valves and hydrants in a manner to prevent damage. Use suitable equipment when lowering materials into the trench.

C. Before pipe is laid, remove all foreign matter from the inside and remove all excess coating material, blisters, oil, grease, dirt and moisture from the inside of the bell end and the outside of the spigot end.

D. The interior of the pipe shall be kept clean during laying, and no trench water shall be allowed to enter the pipe.

E. Assemble joints in accordance with AWWA C600 for ductile iron pipe and AWWA C605 for PVC pipe.

F. Pipe lines intended to be straight shall be so laid. Deflections from straight line or grade, when required, shall not exceed those listed below:

Maximum Deflection Full Pipe, Push-On Joints - D.I. Pipe

Pipe Diameter	Deflection Angle	Maximum Deflection - Inches	
		18-Ft. Length	20- Ft. Length
4"	5°	19	21
6"	5°	19	21
8"	5°	19	21
10"	5°	19	21
12"	5°	19	21

Maximum Deflection Full Pipe, Mechanical Joints D.I. & PVC

Pipe Diameter	Deflection Angle	Maximum Deflection - Inches	
		18-Ft. Length	20- Ft. Length
4"	8°-18'	31	35
6"	7°-7'	27	30
8"	5°-21'	20	22
10"	5°-21'	20	22
12"	5°-21'	20	22

PVC pipe with push-on joints shall not be deflected at joints. Pipe may be curved in accordance with the following table:

Longitudinal Bending Push-On Joints - PVC Pipe	
Pipe Size Inches	Minimum Bending Radius Feet
4	100
6	145
8	190
10	275, 235
12	275

3.04 PVC Pipe Tracer Wire

A. Furnish and install tracer wire for PVC water main in accordance with Section 33 05 26.

3.05 Pipe Bedding and Cover

A. Place four inches of bedding material beneath pipe.

B. Place bedding material around the pipe to the spring line. Work the material in and around the pipe

by hand to provide uniform support.

C. Place cover material carefully to a level six inches above the pipe.

3.06 Backfilling

A. Backfill in accordance with the Section 31 23 33.

3.07 Separation from Sewer

A. Lay water mains a minimum of 8 feet from sewer lines (center to center).

B. When water mains cross over sewers, provide a minimum of 6 inches from the bottom of the water main to the top of the sewer.

C. When water mains cross under sewers, provide a minimum of 18 inches from the top of the water main to the bottom of the sewer.

3.08 Valve Installation

A. Provide valve box for each valve unless the plans call for a valve manhole.

B. Install valve adapter on valve and set box on adapter, as per manufacturer's instructions.

C. Set valve box vertical with the cover flush with finish grade. Install box so that there is a minimum of six inches of adjustment above and below finish grade elevation.

3.09 Hydrant Installation

A. Set all hydrants plumb and have the nozzles parallel with or at right angles to the curb line or street with the pumper nozzle facing the curb or street.

B. Set hydrant height above grade as shown on the Standard Detail Drawings. Contractor is responsible for necessary adjustments, as approved by the Engineer, to set the hydrant bury line to the finished grade.

C. Connect hydrants to the main with a 6-inch lead. Install a 6-inch gate valve on the lead.

D. Provide drainage at the base of the hydrant by placing crushed stone wrapped in geotextile at the base of the hydrant. The stone shall extend at least 6 inches above the hydrant drain port. Where ground waters rise above the drain port or when the hydrant is located within 8 feet of a sanitary or storm sewer, plug the drain port.

E. Provide plastic bag or poly-wrap covering over top of hydrant until the water main has been accepted by Engineer for fire protection.

3.10 Thrust Restraint

A. Provide joint restraints for mechanical joint connections on hydrant leads, hydrants, branch of tees, 45^0 bends, caps, and plugs. Install joint restraints in accordance with the manufacturer's instructions.

B. In addition to joint restraints, provide precast concrete reaction block (cast-in-place concrete may be used) with an approximate weight of approximately 600 lbs. for all horizontal tees and bends, and for end caps, and hydrants. Concrete masonry blocks are not acceptable.

C. For vertical offsets, provide joint restraints for all fittings and rods between fittings.

3.11 Electrical Conductivity

A. Provide electrical conductivity (not applicable to PVC pipe). Bolt copper straps of push-on pipe together. For mechanical joint pipe, bolt copper strip to bell. Bare metal on bell prior to connection.

B. For pipes cut in the field, exothermically weld the bonding straps to the pipe. The pipe metal shall

be bared at the point of attachment. Coat bear metal with asphaltic material.

C. Provide conductivity across all gate valves and across the hydrant bottom using a copper strap or #4 AWG bare copper wire welded to pipe on either side of the valve or hydrant bottom.

3.12 Hydrostatic Testing

A. All water main and water services shall be tested hydrostatically to a pressure of 150 psi in accordance with AWWA C600. Perform testing in the presence of the Engineer or authorized representative of the Owner.

B. Water services that serve fire protection systems only shall be tested as in A above except that the test pressure shall be 200 psi.

C. The Contractor shall provide all equipment and perform all work required in connection with the tests.

D. Each section tested shall be slowly filled with water, care being taken to expel all air from the pipes.

E. Conduct leakage test at the same time or following the pressure test in accordance with AWWA C600 for ductile iron pipe and AWWA C605 for PVC pipe. The leakage test shall be for a minimum of two hours. The test pressure shall be maintained within 5 psi of the specified test pressure. The allowable leakage shall be determined by the following equation:

1. AWWA C600 - Ductile Iron Pipe

$$L = \frac{SD(P)^{1/2}}{133{,}200}$$ (for 18ft pipe lengths)

$$L = \frac{SD(P)^{1/2}}{148{,}000}$$ (for 20ft pipe lengths)

L = allowable leakage in gallon
s per hour.
S = length of pipe tested in feet.
D = nominal pipe diameters in inches.
P = average test pressure in psi.

(table reflects 18ft pipe length calculations only)

Allowable Leakage - GPH/1,000 Ft. 150 PSI Average Test Pressure		Allowable Leakage - GPH/1,000 Ft. 200 PSI Average Test Pressure	
Pipe Size Inches	Allowable Leakage Gallons per Hour	Pipe Size Inches	Allowable Leakage Gallons per Hour
3	0.28	3	0.32
4	0.37	4	0.42
6	0.55	6	0.64
8	0.74	8	0.85
10	0.92	10	1.06
12	1.10	12	1.27

2. AWWA C605 - PVC Pipe

$$L = \frac{ND(P)^{1/2}}{7{,}400}$$

L = allowable leakage in gallons per hour.
N = number of joints in the length of pipe tested.
D = nominal pipe diameters in inches.
P = average test pressure in psi.

Allowable Leakage for 50 Joints (GPH)		
Pipe Size Inches	Average Test Pressure (PSI)	
	150	200
3	0.25	0.29
4	0.33	0.38
6	0.50	0.57
8	0.66	0.76
10	0.83	0.96
12	0.99	1.15

F. Any section of pipe that fails the test shall be repaired and retested. The cost of the testing shall be included in the cost of the water main. No separate payment will be made.

3.13 Tapping Sleeve Testing

A. All tapping sleeves shall be hydrostatically tested at a minimum of 150 PSI prior to tapping.

3.14 Disinfection and Bacteriological Testing

A. Before being placed in service, the entire line shall be flushed and chlorinated in accordance with the requirements of AWWA C651.

B. During the chlorination process, operate all valves, hydrants and accessories to ensure contact of all parts with the chlorine solution.

C. After chlorination, the water shall be flushed from the system at its extremities until the chlorine concentration in the water leaving the mains is no higher than that generally prevailing in the system or less than 1 mg/l. The flushed water shall be treated for chlorine removal prior to discharge to surface waters in accordance with the municipalities WPDES General Permit for Hydrostatic Test Water and Water Supply System Water, Section 3.2.2, Requirements for Discharge from Well, Water Tower, and Distribution System Disinfection. Methods for chlorine removal from the flushed water may include natural dissipation, chemical reduction, seepage discharge. The method chosen by the Contractor shall be approved by the Engineer and/or Owner prior to discharge.

D. After final flushing and before the water mains are placed in service, bacteriologically safe tests must be obtained. Two samples, at least 24 hours apart, are required. Sample in accordance with the requirements of AWWA C651.

E. No separate payment will be made for the disinfection and bacteriological testing. The cost shall be included in the pipe installation items.

3.15 Service Connections

A. Corporation stops for water service connections shall be placed to service each building site as required. The minimum water service size is 1-inch.

B. Unless otherwise noted, construct copper service laterals to the property line. Set the curb stop and box at the property line. The lateral shall have a minimum 7.0 feet of cover. Service fittings shall not be installed under the street. Avoid setting curb stops in driveways or sidewalks, when possible.

C. Installation
1. Install copper service with 7.0 feet of cover.
2. Locate service taps at the 10:00 or 2:00 o'clock positions on the circumference.
3. Service taps shall be at least 12 inches apart. Stagger taps around circumference when more than one tap is made at same location.
4. Prior to installation of corporation stop, wrap threads with two wraps of 3 mil Teflon tape.
5. Provide a horizontal half loop in the service pipe at the tap.

D. Water service laterals 2 1/2-inch diameter and larger shall have a minimum center-to-center horizontal separation of 8 feet from sewer laterals or mains.

E. Water service laterals 2-inch diameter and smaller shall have a minimum center-to-center horizontal separation of 30 inches from sewer laterals or mains. Separation may be less than 30 inches if the bottom of the water lateral is at least 12 inches (outside pipe to outside pipe) above the sewer lateral or main.

F. Service Saddles: All taps for PVC water main require a service saddle. Two-inch taps on 6-inch ductile iron water main require a double strap service saddle.

3.16 As-Built Measurements

A. Provide as-built measurements clearly marked on a clean copy of the Construction Drawings. These as-built measurements are incidental to the Work. As a minimum, include the following items:
   1. Distance between valves, tees and bends.
   2. Ties from ground features to tees and bends to clearly located the buried utility construction.
   3. Distance from tees, valves, or bends to corporation stops.
   4. Length of service laterals.

END OF SECTION

SECTION 33 21 13.14

WELL AND PUMPING EQUIPMENT

PART 1 - GENERAL

1.01 Section Includes

A. Construction of a water supply well for a wastewater treatment facility in a consolidated formation using rotary methods.

B. Furnishing and installation of pumping equipment and controls.

1.02 References

A. ASTM A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

B. ASTM A106 - Seamless Carbon Steel Pipe for High-Temperature Service.

C. ASTM D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.

D. NR 812 - Wisconsin Administrative Code, Well Construction and Pump Installation.

1.03 Quality Control

A. Driller shall have a valid Wisconsin well driller's license and be experienced in the type of work specified.

B. Work shall be done in accordance with NR 812.

C. During well construction make daily construction reports to the Engineer.

1.04 Submittals

A. Submit Wisconsin Well Constructor's Report to the Department of Natural Resources and to the Engineer.

B. Submit test pumping report to Engineer.

C. Submit water samples to State Laboratory of Hygiene for analysis. Submit laboratory results to Engineer.

D. Submit manufacturer's literature on well pump, pitless adapter, pressure tank and controls.

1.05 Drilling Samples

A. Drilling samples shall be taken at 5-foot intervals and all changes in formation. Dry and bag the samples and deliver them to the Wisconsin Geological Survey for logging.

1.06 Well Design

A. The well shall be an 8-inch well approximately 300 feet deep in a consolidated formation. The well shall be cased to an approximate depth of 172. The well shall be grouted to the depth of the casing. Pump setting shall be at approximately 195 feet.

PART 2 – PRODUCTS

2.01 Well - Casing and Liner Pipe

A. New, unused, and non-reclaimed steel pipe meeting requirements of ASTM A53; ASTM A106; ASTM A589, Type I, Grade A or B, Type II, Grade A ; API 5CT; API 5D; or API 5L. Dimensions and weight of the pipe shall meet the requirements of the following table.

Minimum Steel Casing Pipe Weights and Dimensions					
Nominal Size in Inches	Weight in Lbs. per Ft.		Thickness in Inches	Diameter in Inches	
	Threaded & Coupled	Plain End		External	Internal
6	19.45	18.97	.280	6.625	6.065
6-5/8	20.00	19.49	.288	6.625	6.049
7	23.00	22.63	.317	7.000	6.366
8	29.35	28.55	.322	8.625	7.981
10	41.85	40.48	.365	10.750	10.020
12	51.15	49.56	.375	12.750	12.000

B. Temporary casing may be lighter weight than specified for a given diameter in the above table.

C. Liner pipe used for sealing off a caving or sloughing zone shall meet the requirements of the above table except that it may have a lesser wall thickness than is required by the table for the diameter of pipe used. Liner pipe shall have a minimum wall thickness of 0.216 inches.

2.02 Well - Accessories

A. Drive Shoe: Welded or threaded to the bottom of the casing being driven. Couplings may not be used for drive shoes.

B. Grout Shoe: Constructed of durable nontoxic material that will not impart taste or odor to water.

C. Drilling Aids: Approved by the Wisconsin Department of Natural Resources.

D. Pitless adapter: Shop assembled and tested. Approved for use in Wisconsin.

E. Well Cap: Type approved by Wisconsin Department of Natural Resources.

F. Drop Pipe: Galvanized Steel; ASTM A53, Schedule 40, screwed joints.

G. Piping shall be as required by the equipment supplier.

H. System drain is required for winterization of the well and system.

2.03 Well - Grout

A. Neat Cement Grout: A mixture of one bag of Portland cement (94 lb.) and 5 to 6 gallons of water. Powdered bentonite may be added uo to a ratio of 5 pounds per 94-lb. Bag of cement. Additives to increase fluidity, control shrinkage or time of set may be used only with approval.

2.04 Well - Pump and Controls

A. Pump
   1. Submersible turbine pump, Sta-Rite Signature 2000 or equal.
   2. Power Supply: 208 volt, 60 Hz, three phase.
   3. Pump Characteristics: 43 GPM at 300 Ft. TDH.

B. Controls: Provide pump controls to start and stop the pump on pressure at the pressure tank. The control shall be by the same manufacturer as the pump. Controls to be mounted near the pressure tank.

C. Pressure Tank (One Required): Steel tank with elastic membrane, precharged for an operating range of 40 psi to 60 psi with a minimum single tank total volume of 62 gallons. Provide an Amtrol Well-X-Trol WX- 251 or equal. Provide a ball valve and a relief valve set to open at 65 psi.

D. The system should be equipped with a drain piping that will allow for water removal and winterization of the system.

E. The Plumbing Contractor and/or General Contractor shall confirm the size, pumping conditions and operation of the well. The above parameters are considered as guidance.

2.03 Enclosure - Slab

A. Provide precast concrete slab with an integral valve vault meeting the requirements of ASTM C478.

2.05 Enclosure - Structure

A. Acceptable Manufactures; Hot Box or Equal

B. Enclosure shall ship fully assembled to allow for quick installation by securing to the concrete pad with the supplied anchor hardware.

C. Enclosures shall be lockable.

D. Drain ports are sized for full port backflow discharge and are designed for a one way operation allowing backflow discharge but not allowing wind, debris and small animals to enter the enclosure.

E. Standard enclosures shall be designed to support a minimum vertical load of 100lb/sf.

F. Standard enclosures shall be designed to support wind speeds up to 120mph.

G. Standard enclosures are ASSE 1060 certified.

2.06 Enclosure - Materials Of Fabrication

A. Fiberglass is minimum of 1/8” thick Thixotropic polyester resin reinforced with fiberglass strand. A smooth yacht quality finish, protected with UV inhibited isopthalic polyester gel coat.

B. Non molded products will utilize an Industrial exterior texture.

C. No wood or particle board to be used in the construction.

D. Insulation shall be 1”-1.5" unicellular, non-wicking, polyisocyanate foam frothed or sprayed in place.
E. The Insulation shall have the following properties:
R-Value 8
Dimensional Stability less than 2% linear change
Compressive Strength 51psi
Flame point 325 degrees
Water absorption .037psf
Porosity 91%

2.07 Enclosure - Recommended Slab Size & Installation

A. Standard enclosures shall be designed to support wind speeds up to 120mph.

B. Standard enclosures are ASSE 1060 certified.

2.08 Enclosure - Materials Of Fabrication

A. The recommended slab size shall be 9” larger than the enclosures exterior dimensions and a minimum of 4” thick.

B. The enclosure shall be mounted to concrete slab per the manufactures instructions provided with the enclosure.

C. The enclosure shall not require assembly.

PART 3 - EXECUTION

3.01 Protection of Water Supply

A. Take necessary precautions during the well construction to prevent contaminated water, gasoline, or other contaminates from entering the well through the opening or by seepage through the ground surface.

B. Store and handle casing pipe in such a manner as to keep the possibility of contamination to a minimum.

C. Maintain a chlorine residual in the well during the drilling operation.

D. If the well becomes contaminated or water having undesirable physical or chemical characteristics enters the well because of the Contractor's neglect, the Contractor shall at his expense remove the contamination.

3.02 Well Construction

A. Perform drilling with rotary equipment.

B. Meet requirements of NR 812.14.

C. When the drill hole shown on the Drawings is approximately the same size as the casing to be installed, the drill shall not be larger than necessary to permit the installation of the casing.

D. Temporary casings may be used to assist in the construction. Remove all temporary casing upon completion of the well.

E. Provide a drive shoe for all driven casing.

F. The upper drill hole may be made larger to allow installation of the casing without driving. If this method is used, the annular space between the casing and the wall of the drill hole shall be grouted.

G. All suspended casings and liners shall have a packer attached to the bottom and spacers shall be used to ensure a uniform annular space.

H. All casing and liner pipe joints shall be watertight. Joints may be welded or threaded couplings. Welding shall meet the requirements of AWS D10.12-89.

I. Any water needed for drilling operations is the responsibility of the Contractor.

3.03 Water Quality Analysis

A. Laboratory Testing: After completion of the test pumping and after disinfection, collect water samples for testing by the State Laboratory of Hygiene or other laboratory approved by the DNR, and transport the samples to the lab. Laboratory analysis shall include: coliform, pH, hardness, iron, manganese and nitrates.

3.04 Plumbness and Alignment

A. Plumbness: The deviation per 100 feet of well depth from plumb of the centerline of the well shall not exceed 75 percent of the well diameter.

B. Alignment: The well shall allow free passage of the pump to be permanently installed in the well to the depth of the pump setting plus 25 percent of the depth.

3.05 Grouting

A. Remove foreign materials from the annular space to be grouted.

B. Provide a minimum annular space of 1-1/2 inch.

C. Use neat cement grout

D. Place grout from the bottom of the open annular space in one continuous operation, completing the placement before the initial set.

E. Grouting shall be performed by pressure methods.

1. Conductor Pipe - Gravity: Place the grout material into the annular space through a funnel or hopper connected to a conductor pipe. Lower the conductor pipe to the bottom of the annular space. The end of the conductor pipe shall be submerged at all times. If the grouting operation is interrupted, raise the conductor pipe above the grout level. Do not re-submerge the conductor until all air and water have been displace from the conductor.

2. Conductor Pipe - Pumped: Place the grout material into the annular space by pumping through a conductor pipe. Lower the conductor pipe to the bottom of the annular space. The end of the conductor pipe shall be submerged at all times. If the grouting operation is interrupted, raise the conductor pipe above the grout level. Do not re-submerge the conductor until all air and water have been displace from the conductor.

3. Grout Shoe: Attach a grout shoe with a check valve to the bottom of the well casing. A conductor pipe or drill stem shall be connected to the grout shoe and shall extend up through the casing to a pump. When the annular space has been filled with grout, remove the conductor pipe or drill stem. After the grout has set for a minimum of 12 hours the grout shoe may be drilled out and the well construction continued.

F. The grout shall be brought up to the ground surface. The density of the grout flowing from the annular space shall be the same as the density of grout being placed. If the grout settles, the driller shall add grout to bring the level up to the specified level.

3.06 Well Development

A. Develop the well until the water is practically clear and free of sand in accordance with NR 812.22.

3.07 Pumping Test

A. Perform a yield and drawdown test of the completed well. Provide pumping equipment capable of pumping within a range of 5 GPM to 50 GPM.

B. Provide all of the necessary equipment and piping to accurately measure the pumping rate and the water level.

C. Unless the time is extended by the Engineer, the pump test shall continue for four hours. Pumping rates and corresponding water levels shall be recorded at intervals of not more than 30 minutes.

D. Keep a log of the test pumping and submit the log to the Engineer at the end of the test. The log shall include the following information:
1. Pump setting
2. Static water level
3. Pumping rate and water level at specified intervals
4. Recovery water levels
5. Water level in test well
6. Amount of sand being pumped
7. Other pertinent data

3.08 Disinfection

A. Following completion of the construction, thoroughly disinfect the well in accordance with NR 812.22 (4).

3.09 Site protection and Cleanup

A. Protect structures, turf, landscaping, and site structures from damage.

B. Discharge water pumped from the well in a manner that does not damage property or cause a nuisance.

C. Remove all debris and unused materials from the site, remove mud pits, and generally leave the site in a neat condition.

3.10 Capping

A. Provide a temporary cap during construction.

3.11 Pump Installation

A. Provide pump with characteristics based on the test pumping.

B. Final pump setting will be established by the Engineer.

C. Provide pitless adapter and permanent well cap.

END OF SECTION

SECTION 33 41 13

STORM SEWER CONSTRUCTION

PART 1 - GENERAL

1.01 Section Includes

A. Construction of storm sewer.

B. Construction of storm manholes and inlets.

1.02 Related Sections

A. Section 31 23 33 - Utility Excavation, Backfill and Compaction.

B. Section 33 39 13 - Sewer Manholes.

1.03 References

A. ASTM A48 - Standard Specification for Gray Iron Castings.

B. ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

C. ASTM A760 - Standard Specification for Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains.

D. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe.

E. ASTM C94 - Standard Specification for Ready-Mixed Concrete.

F. ASTM C270 - Standard Specification for Mortar for Unit Masonry.

G. ASTM C443 - - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.

H. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.

I. ASTM C506 - Reinforced Concrete Arch Culvert, Storm Drain and Sewer Pipe.

J. ASTM C507 - Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe.

K. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

L. ASTM A929 - Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe.

M. ASTM D3212 - Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.

N. ASTM F477 - Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

O. ASTM F2736 - Standard Specification for 6 to 30 in. (152 to762 mm) Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe.

P. ACI 304 - Recommended Practice for Measuring, Transporting, and Placing Concrete.

Q. ACI 347 - Recommended Practice for Concrete Formwork.

1.04 Submittals

A. Submit product data for pipe and accessories.

B. Submit bedding gradation if requested.

C. Submit as-built measurements.

1.05 Quality Assurance

A. All pipes and fittings shall be new and unused.

B. Provide at least one person thoroughly trained and experienced in the skills required, who shall be completely familiar with the work described in this section, who shall be present at all times during progress of the work of this section, and who shall direct all work performed under this section.

PART 2 - PRODUCTS

2.01 Pipe

A. Reinforced Concrete (RCP)
   1. Pipe: ASTM C76, ASTM C506, or ASTM C507. Provide Class III unless otherwise indicated on the Drawings or in the Specifications.
   2. Joints
      a. Circular Pipe: Tongue and groove with rubber gaskets, ASTM C443.
      b. Elliptical and Arch Pipe: Tongue and groove with cold plastic sewer joint compound or tongue and groove with external sealing collar, MacWrap or equal.

B. Corrugated Steel (Use only when indicated on Drawings)
   1. Galvanized Pipe:
      a. Material: Galvanized steel coil, ASTM A929.
      b. Pipe: Manufactured in accordance with ASTM A760, Type I or II.
   2. Aluminized Pipe:
      a. Material: Aluminized Type 2 steel coil, ASTM A929.
      b. Pipe: Manufactured in accordance with ASTM A760, Type I or II.
   3. Joints: Matching bond connectors.
   4. Minimum Pipe Gauge:

Minimum Pipe Gauge			
Pipe Diameter	2-2/3" x 1/2" Corrugations	Pipe Diameter	3" x 1" Corrugations
6"	18	60" - 90"	16
8" - 24"	16	96" - 102"	14
30" - 36"	14	108" - 114"	12
42" -54"	12	120"	10
60" - 72"	10		
78" - 98"	8		

C. Corrugated Polyethylene (Use only when indicated on Drawings.)
   1. Smooth interior, with annular exterior corrugations meeting requirements of ASTM F2736.
   2. Joints: Gasketed integral bell and spigot meeting requirements of ASTM F2736. Joints shall be watertight in accordance with ASTM D3212. Gaskets shall meet the requirements of ASTM F477.
   3. Fittings: Polyethylene fittings meeting requirements of ASTM F2736.
   4. Acceptable Manufacturers: ADS N-12 HP or equal.

2.02 End Sections

A. Manufacturer's standard product.

B. Provide concrete for concrete pipe and corrugated metal for steel pipe or polyethylene pipe.

2.03 Pipe Bedding and Cover

A. Bedding and Cover:

   1. Class IA - Clean angular crushed stone, crushed rock, or crushed gravel conforming to the following gradation:

Sieve Size	% Passing By Weight
1”	100
3/4”	90 - 100
3/8”	20 -55
No. 4	0 - 10
No. 8	0 - 5

2. Class IB - Clean angular crushed stone, crushed rock, or crushed gravel conforming to the following gradation:

Sieve Size	% Passing By Weight
1/2”	100
3/8”	85 - 100
No. 4	10 - 30
No. 200	0 - 5

3. Class II - Coarse-grained soils free from organic matter, trash, debris, and frozen material with 100% passing the 1-1/2” sieve and less than 5% passing the No. 200 sieve. Generally including sands, gravels, and sand-gravel mixtures with little or no fines. ASTM D2487 Soil Types GW, GP, SW and SP are included in this class. Excavated material may be used if it meets the above material requirements.

4. Class III - Coarse-grained soils with fines free from organic matter, trash, debris, and frozen material with 100% passing the 1-1/2” sieve and 12% - 50% passing the No. 200 sieve. Generally includes silty or clayey sands, gravels, or sand-gravel mixtures. ASTM D2487 Soils Types GM, GC, SM and SC, are included in this class. Excavated material may be used if it meets the above material requirements.

2.04 Manholes and Inlets

A. General
1. Precast concrete manholes and inlets (and castings) shall meet requirements of Section 33 39 13 with the exceptions noted.
2. Exterior/interior manhole seals are not required.
3. Structure pipe connection shall be constructed using ready-mix concrete collars with a minimum of 6” of concrete around the entire circumference of the pipe at the structure exterior and flush with the structure interior filling all voids/cavities. No mortar will be allowed.
4. Concealed pickhole covers are not required.

B. Cast-In-Place Concrete
1. Ready-mixed concrete meeting requirements of ASTM C94; 3000 psi 28-day strength, 3 to 4-inch slump, maximum aggregate size of 1-1/2 inch and air entrainment of 7 percent.
2. Reinforcing steel: ASTM A615, Grade 60.

C. Crushed Stone: Hard durable particles of crushed stone or gravel substantially free from shale or lumps of clay or loam meeting the following gradation:

Sieve Size	% Passing By Weight
2”	100
1-1/2”	90 - 100
1”	20 - 55
3/4”	0 - 15
1/2”	0 - 5

PART 3 - EXECUTION

3.01 Handling of Material

A. All materials shall be handled with care to avoid damage. No material shall be dropped.

B. All defective material shall be removed from the job site.

C. Contractor is responsible for arranging suitable sites for material storage.

3.02 Lines and Grade

A. All pipe shall be laid to the lines and grades shown on the drawings or given by the Engineer.

B. The use of a laser beam for maintaining line and grade is required unless other methods are approved by the Engineer.

C. A person qualified to operate the equipment shall be present when the laser is in use.

3.03 Laying Pipe

A. Lay pipe uniformly to line and grade so that the finished sewer presents a uniform bore. Noticeable variations from true alignment and grade will be sufficient cause for rejection of the work.

B. Commence at the lowest point and proceed to the upper end. Lay pipe with bell-end pointing up-grade.

C. For reinforced concrete pipe provide a minimum of six inches between the pipe wall and the trench wall. For polyethylene and corrugated steel pipe, provide a minimum distance between the pipe wall and the trench wall of 2.5 times the pipe diameter for poor or expansive soils and a minimum of 12 inches for all other soils.

D. Rest each pipe on the full length of its barrel.

E. Do not lay the next pipe until the previous pipe is backfilled sufficiently to prevent movement during joining.

F. For flexible pipe do not disturb the installed pipe and its embedment when using movable trench boxes. If the box extends below the cover material, use methods to assure that the integrity of the embedment is maintained when the box is moved.

G. Keep water out of the pipe. Do not let water rise into or around the pipe until the trench is filled at least one foot above the pipe.

H. When work is stopped for any reason, securely plug the end of the pipe.

I. Jointing: Assemble joints in accordance with the pipe manufacturer's instructions.

J. Do not drive over flexible pipe unless there is a minimum of 24 inches of cover material over the pipe.

3.04 Rigid Pipe Bedding - RCP

A. Pipe bedding and cover shall be Class IA, Class IB, Class II, or Class III. If pipe is in groundwater, bedding and cover shall be Class IA or IB. Use the same material for bedding and cover.

B. Place bedding material below and around pipe to the spring line to provide side support and to prevent lateral and vertical movement of the pipe. Place material in 6-inch maximum layers. Work the material in and around the pipe by hand to provide uniform support.

C. Place cover material to a level 6 inches above the top of the pipe.

3.05 Pipe Bedding - Polyethylene and Corrugated Steel

A. Pipe bedding and cover shall be Class IA or Class IB. If pipe is in groundwater, use Class IB.

B. Place bedding material below and around pipe to the spring line to provide side support and to prevent lateral and vertical movement of the pipe. Place Class IA and Class IB material in 6-inch maximum layers. Work the material in and around the pipe by hand to provide uniform support.

C. Place cover material to a level 12 inches above the top of the pipe. Place Class IA and Class IB

material in maximum 6-inch layers. Class IA material shall be worked by hand. Class IB material shall be compacted using hand tampers or vibratory compacters. Each stage shall be compacted by hand or mechanical tamping to the percent of the maximum dry density in accordance with ASTM D698 indicated below:

Material	Density
Class IA	None
Class IB	85%

D. Do not use a hydrohammer with less than 4 feet of cover over the pipe.

3.06 Backfilling

A. Backfill in accordance with the Section 31 23 33.

3.07 Manhole and Inlet Construction

A. Cast-In-Place: Cast-in-place manholes and inlets shall be constructed as shown on the Drawings. If cast-in-place manholes are not shown and the Contractor desires to provide them in lieu of precast concrete, Shop Drawings prepared by a qualified Engineer must be submitted for approval.

B. Construction
1. Provide two to four inches of precast adjusting rings unless otherwise indicated.
2. Manholes that are constructed when temperature is below 35°F shall be protected from freezing.
3. Limit the manhole excavation to the size required to install the manhole. Provide bracing and sheathing as necessary.
4. Provide six inches of crushed stone under the manhole base.
5. Precast manhole and inlet pipe connections shall be constructed using ready-mix concrete collars with a minimum of 6” of concrete around the entire circumference of the pipe at the structure exterior and flush with the structure interior filling all voids/cavities. No mortar will be allowed.
6. Inverts shall be the same size as the diameter of the largest adjoining pipe. Shape inverts in accordance with the Standard Drawings. Provide a smooth finish.
7. Provide tongue and groove joints sealed with butyl rubber rope for reinforced concrete barrel sections.
8. Construct cast-in-place structures in accordance with ACI 304 and ACI 347.
9. Frames and Covers: Provide frames and covers in the size and type indicated on the Drawings. Set rims of manholes and inlets at finish grade elevation. In paved areas set the rims one-half inch below the pavement surface. Set the rim to match the slope of adjacent paving. Perform final rim adjustment after base course has been placed.
10. Frame/Adjusting Ring Joints: Provide a mortar joint for manholes and field inlets. Dry stack adjusting rings on curb inlets and mortar casting to top ring at time of curb construction.
11. Provide steps for manholes and circular inlets that are 4-feet or more in depth and 4-feet in diameter and larger. Place steps in vertical alignment, equally spaced at 16” on-center with top step not more than 24 inches from top of casting.

3.08 End Sections

A. Provide flared end sections on all inlet and outlet ends of storm sewer that do not terminate within a manhole or inlet. Provide prefabricated grates on all end sections for pipes larger than 12-inch diameter. Provide riprap at discharge end as indicated on the drawings.

3.09 Separation from Water Main

A. Storm sewer mains shall be placed at least 8 feet horizontally (center to center) from any existing or proposed water main. If, due to ledge rock conditions or physical barriers, the Engineer determines that the 8-foot horizontal separation cannot be maintained. The horizontal separation may be reduced to a minimum of 3 feet if the bottom of the water main is at least 18” above the top of the sewer.

B. The vertical separation for storm sewer mains crossing under water mains shall be such that the elevation from the top of the sewer to the bottom of the water main is at least 6”. The vertical separation for storm sewer mains crossing over water mains shall be such that the elevation from

the bottom of the sewer to the top of the water main is a least 18”.

C. If an existing water main is encountered while laying the storm sewer and it is impossible to obtain the proper vertical separation, immediately inform the Engineer. Reconstruct the water main for a minimum distance of 8 feet on either side of the storm sewer to permit centering one full length of water main over the storm sewer.

3.10 As-Built Measurements

A. Provide as-built measurements clearly marked on a clean copy of the Contract Drawings. Tie location of bends and all connections not terminating with a manhole or inlet to ground features to clearly locate the buried construction. As-built measurements are incidental to the Work.

END OF SECTION

BIDDING DOCUMENTS

McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

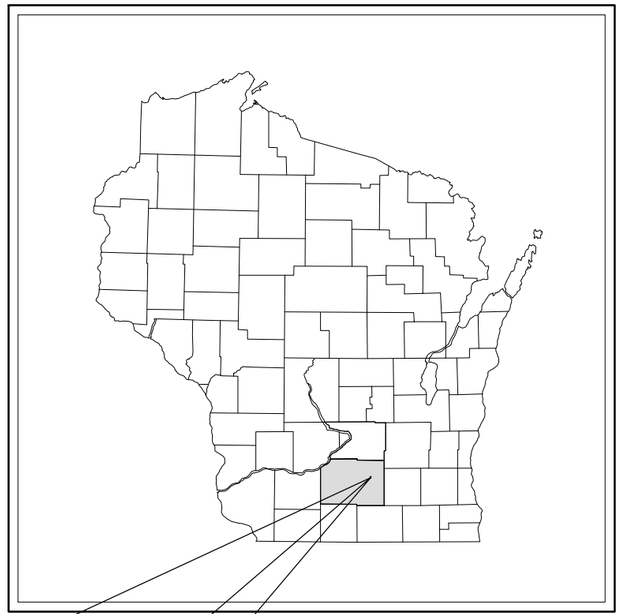
ENGINEER SEAL:

General Engineering Company

P.O. Box 340 • 916 Silver Lake Dr. • Portage, WI 53901
608-742-2169 (Office) • 608-742-2592 (Fax)
www.generalengineering.net

BUILDING DESIGN CRITERIA

- CODE COMPLIANCE PER 2011 WISCONSIN COMMERCIAL BUILDING CODE (WCBC) (2009 I - CODES)
- USE & OCCUPANCY
  A-5, OUTSIDE ASSEMBLY
- CONSTRUCTION CLASSIFICATION - TYPE VB
  WOOD FRAMED UNPROTECTED
- ALLOWABLE AREA
  UNLIMITED (TABLE 503)
- OCCUPANT LOAD
  90 - TOTAL
- BUILDING IS NOT PROTECTED WITH A COMPLETE NFPA 13 FIRE SPRINKLER SYSTEM



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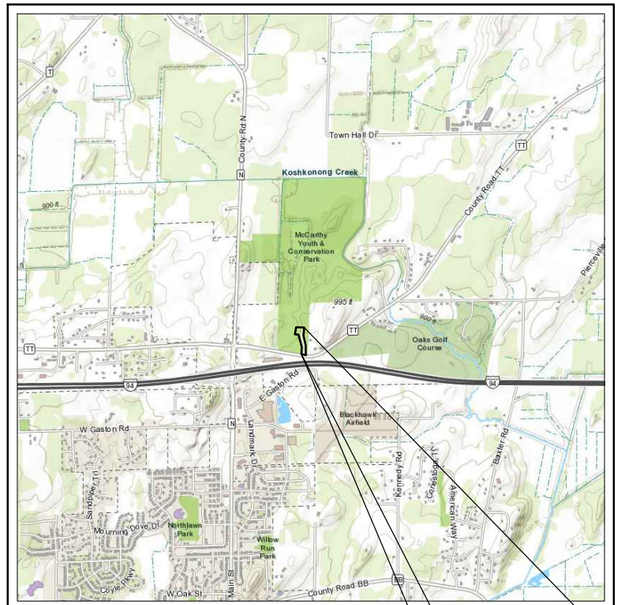

TOWN OF SUN PRAIRIE
LOCATION PLAN

TABLE OF CONTENTS:

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McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS
TOWN OF SUN PRAIRIE
DANE COUNTY, WI

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SCALE

DRAWN BY	SRR
REVIEWED BY	LAL
ISSUE DATE	OCT. 2021
GEC FILE NO.	2-0321-169
SHEET NO.	G1.0

BIDDING DOCUMENTS

CONSTRUCTION NOTES

GENERAL

1. ALL EXISTING UNDERGROUND UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND SHOULD BE FIELD VERIFIED, BY CONTRACTOR, PRIOR TO CONSTRUCTION.

WATER MAIN

1. UNLESS OTHERWISE INDICATED BY DESIGN GRADE, MAINTAIN A 7.0' MINIMUM DEPTH OF COVER OVER PROPOSED WATER MAIN AND WATER MAIN LATERALS.
2. UNLESS OTHERWISE INDICATED FOR WATER MAIN CROSSINGS BELOW STORM SEWER & SANITARY SEWER PIPES CONTRACTOR SHALL MAINTAIN A MINIMUM 18" OF SEPARATION FROM EDGE OF PIPE TO EDGE OF PIPE.
3. LATERALS SHALL BE 1" COPPER UNLESS OTHERWISE INDICATED.

STORM SEWER

1. STORM SEWER PIPE LENGTHS ARE SHOWN MEASURED FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE.

GRADING & EROSION CONTROL NOTES

1. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO CONSTRUCTION.
2. SILT FENCE, TEMPORARY SEDIMENT BASIN, & ROCK CONSTRUCTION ENTRANCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES, INCLUDING CLEARING & GRUBBING.
3. CONTRACTOR IS RESPONSIBLE FOR WEEKLY DNR INSPECTION REPORTS IN ACCORDANCE WITH NR 216.46(9).
4. ADDITIONAL EROSION CONTROL MEASURES MAY BE ADDED ON AN AS-NEEDED BASIS.
5. ANY AREAS WHERE GRADING IS COMPLETE SHALL BE STABILIZED WITH FERTILIZER, SEED, & MULCH AS SOON AS POSSIBLE.
6. ALL BEST MANAGEMENT PRACTICES WILL BE INSTALLED BY THE TIME THE CONSTRUCTION SITE IS CONSIDERED STABILIZED.
7. A COPY OF THIS EROSION CONTROL PLAN SHALL BE KEPT ON SITE THROUGHOUT THE DURATION OF THE PROJECT.
8. STOCKPILES LEFT INACTIVE FOR 7 DAYS SHALL BE SEEDED AND SURROUNDED BY SILT FENCE.
9. ALL WASTE AND UNUSED BUILDING MATERIALS (INCLUDING GARBAGE, DEBRIS, CLEANING WASTES, OR OTHER CONSTRUCTION MATERIALS) SHALL BE PROPERLY DISPOSED OF AND NOT ALLOWED TO BE CARRIED BY RUNOFF INTO RECEIVING CHANNEL.
10. EROSION CONTROL MAT CLASS I, TYPE A WILL BE USED IN NON-CHANNEL AREAS AND CLASS I, TYPE B WILL BE USED IN CHANNEL AREAS.
11. ALL DEWATERING PERMITTING, IF REQUIRED, IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE IN ACCORDANCE WITH DNR TECHNICAL STANDARD 1061.
12. STREETS SHALL BE SWEPT AT THE END OF EACH WORK DAY OR AS DIRECTED BY THE MUNICIPALITY.
13. TRACKING PADS SHALL BE USED AT THE CONSTRUCTION ENTRANCE AND EXITS.
14. ALTHOUGH ROCK CONSTRUCTION TRACKING PADS MAY NOT BE SHOWN ON THE PLANS, THE CONTRACTOR SHALL INSTALL THEM AS NECESSARY OR AS DIRECTED BY THE ENGINEER TO MINIMIZE TRACKING ONTO ADJACENT STREETS. THESE PADS ARE CONSIDERED INCIDENTAL TO THE WORK AND WILL NOT BE MEASURED OR PAID FOR SEPARATELY.
15. CONTRACTOR WILL BE RESPONSIBLE FOR ALL DUST CONTROL.
16. ALL BANK AREAS DISTURBED SHALL BE STABILIZED WITH EROSION CONTROL MAT IMMEDIATELY.
17. POSITIVE DRAINAGE AWAY FROM THE BUILDING WILL BE THE RESPONSIBILITY OF THE CONTRACTOR UNLESS OTHERWISE CONFIRMED BY THE ENGINEER.
18. DOWN SPOUTS SHALL BE DIRECTED IN A SAFE MANNER AND COMPLY WITH ALL LOCAL AND STATE REGULATIONS.
19. ALL FILL PLACED UNDER BUILDING AND PAVED AREAS SHALL BE STRUCTURALLY SOUND.
20. SEDIMENT WILL BE REMOVED FROM BEHIND SEDIMENT FENCES AND BARRIERS BEFORE IT REACHES A DEPTH THAT IS EQUAL TO HALF THE BARRIER'S HEIGHT.
21. BREAKS AND GAPS IN SEDIMENT FENCES AND BARRIERS WILL BE REPAIRED IMMEDIATELY. DECOMPOSING STRAW BALES WILL BE REPLACED (TYPICAL BALE LIFE IS THREE MONTHS).
22. ALL SEDIMENT THAT MOVES OFF-SITE DUE TO CONSTRUCTION ACTIVITY OR STORM EVENTS WILL BE CLEANED UP BEFORE THE END OF THE SAME WORKDAY.
23. ALL INSTALLED EROSION CONTROL PRACTICES WILL BE MAINTAINED UNTIL THE DISTURBED AREAS THEY PROTECT ARE STABILIZED.
24. ALL EROSION CONTROL MAT SHALL BE INSTALLED WITHIN 24 HOURS OF FINAL GRADES BEING ESTABLISHED.

EXISTING LINETYPES LEGEND

——San——	SANITARY SEWER
——ST——	STORM SEWER
——WM——	WATER MAIN
——FM——	FORCE MAIN
——E——	ELECTRIC
——OE——	OVERHEAD ELECTRIC
——G——	GAS
——FO——	FIBER OPTIC
——T——	TELEPHONE
——TV——	TV
—x—x—x—	FENCE
o——o——o	GUARD RAIL
— GL — GL — GL —	GRADING LIMITS
— SF — SF — SF —	SILT FENCE
— DB — DB — DB —	DOUBLE SEDIMENT BARRIER
+++++++	TRAIN TRACKS
	TREELINE

SYMBOLS LEGEND

- EXISTING MANHOLE
- PROPOSED MANHOLE
- EXISTING HYDRANT
- PROPOSED HYDRANT
- VALVE
- CURB STOP
- TRACER WIRE TERMINAL BOX
- WELL
- PROPERTY CORNER
- LIGHT POLE
- POWER / TELEPHONE POLE GUY WIRE
- UTILITY PEDESTAL
- SIGN
- SOIL BORING
- MONITORING WELL
- MAILBOX
- CAUTION — POTENTIAL HAZARD
- BENCHMARK
- GEC-CP # — CONTROL POINT
- DECIDUOUS TREE
- CONIFEROUS TREE
- HANDICAP SYMBOL

DIGGERS HOTLINE NOTE

DIGGERS HOTLINE
DIAL 811 or 1-800-242-8511
Member One Call System International
To Obtain Location of Participants Underground Facilities Before You Dig in Wisconsin
Wis Statute 182.0175 (1974) Requires Min. 3 Work Days Notice Before You Excavate

ABBREVIATION LIST

B-B = BACK TO BACK
BOC = BACK OF CURB
BOP = BOTTOM OF PIPE
BOW = BOTTOM OF WALL
C-C = CENTER TO CENTER
CL = CENTERLINE
CP = CONTROL POINT
DIA = DIAMETER
ELEV = ELEVATION
EOG = EDGE OF GRAVEL
EOP = EDGE OF PAVEMENT
EX = EXISTING
FL = FLOW LINE
FM = FORCE MAIN
HC = HORIZONTAL CURVE
HP = HIGH POINT
IE = INVERT ELEVATION
INL = INLET
INV = INVERT
IOS = INSIDE OF STRUCTURE
L = LENGTH
LN = LINE
LP = LOW POINT
MH = MANHOLE
MIN = MINIMUM
MP = MIDPOINT
PC = POINT OF CURVE
PI = POINT OF INTERSECTION
PRO = PROPOSED
PT = POINT OF TANGENT
PVC = POINT OF VERTICAL CURVE
PVI = POINT OF VERTICAL INTERSECTION
PVMT = PAVEMENT
PVT = POINT OF VERTICAL TANGENT
R = RADIUS
ROW = RIGHT OF WAY
S = SANITARY SEWER SERVICE LATERAL
SAN = SANITARY SEWER
SE = SPOT ELEVATION
ST = STORM SEWER
STA = STATION
STD = STANDARD
TC = TOP OF CURB
TOP = TOP OF PIPE
TOW = TOP OF WALL
TYP = TYPICAL
UOS = UNLESS OTHERWISE SPECIFIED
VC = VERTICAL CURVE
W = WATER MAIN SERVICE LATERAL
WM = WATER MAIN

OWNER

DANE COUNTY PARKS
5201 FEN OAK DR.
MADISON, WI 53718
PHONE: (608) 224-3730

UTILITIES

1. **ELECTRIC**
   ALLIANT ENERGY
   PO BOX 77002
   MADISON, WI 53707
2. **TELEPHONE**
   FRONTIER
   100 COMMUNICATIONS DR.
   SUN PRAIRIE, WI 53590
   PHONE: (608) 608-837-1122
3. **GAS**
   WE ENERGIES
   333 W. EVERETT ST.
   MILWAUKEE, WI 53290-1000
   PHONE: (800) 558-3303

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LEGEND & NOTES
McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

NO.	BY	DATE	REVISIONS

SCALE

DRAWN BY	SRR
REVIEWED BY	LAL
ISSUE DATE	OCT. 2021
GEC FILE NO.	2-0321-169
SHEET NO.	G1.1

BIDDING DOCUMENTS

NOTES:

1. ALL EXISTING UNDERGROUND UTILITY LOCATIONS ARE APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL GENERAL NOTES FOUND ON SHEET G1.1.

DIGGERS HOTLINE
DIAL 811 or 1-800-242-8511
To Obtain Location of Participants Underground Facilities Before You Dig in Wisconsin
Wis Statute 182.0175 (1974) Requires Min. 3 Work Days Notice Before You Excavate

BENCHMARK TABLE

BENCHMARK	DESCRIPTION	ELEVATION
TBM #1	CHISELED "X" IN CONCRETE	932.91'
TBM #2	CHISELED "X" IN CONCRETE	932.17'

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EXISTING SITE PLAN
McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS
TOWN OF SUN PRAIRIE
DANE COUNTY, WI

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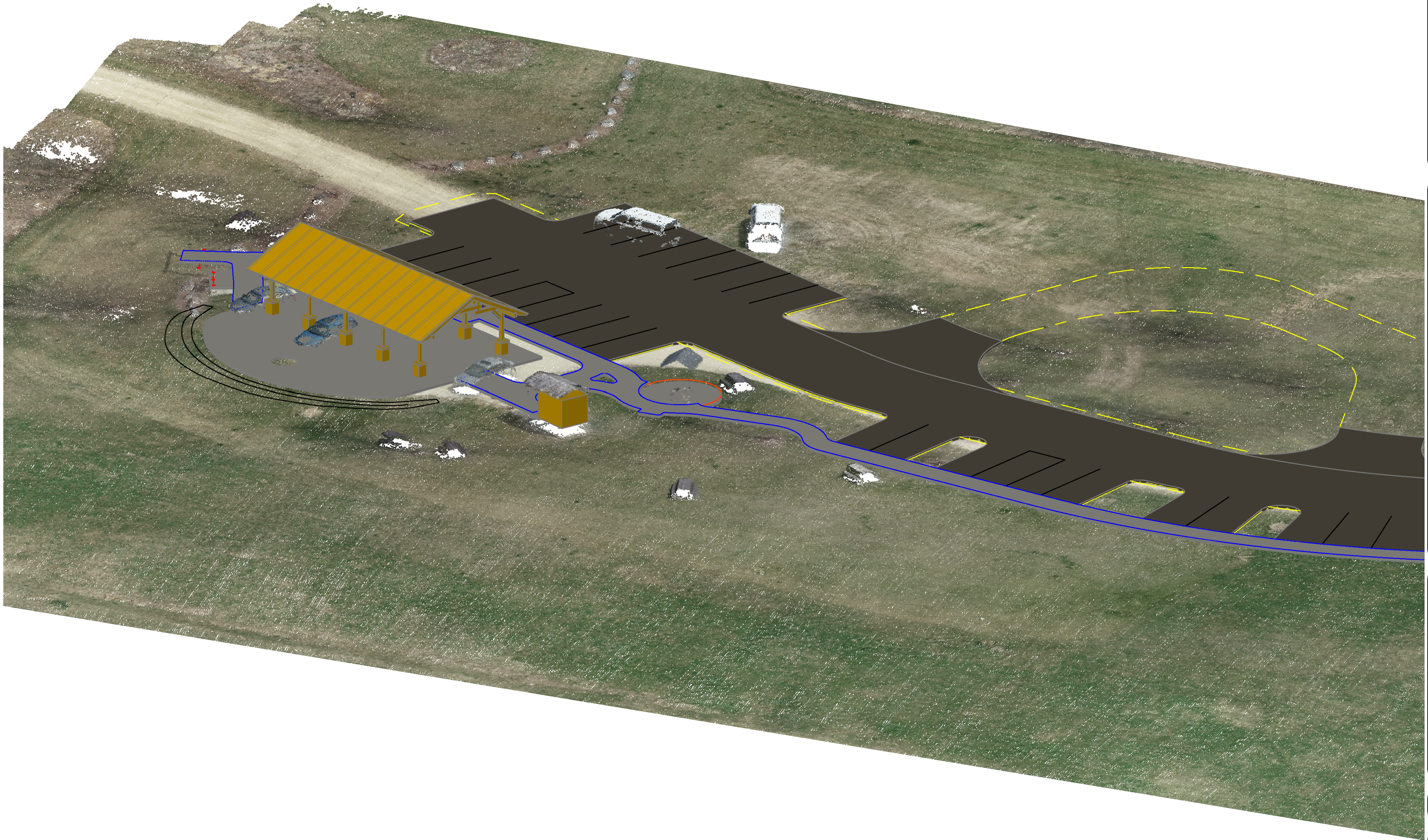

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ISOMETRIC SITE PLAN

McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

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NOTES:

1. ALL EXISTING UNDERGROUND UTILITY LOCATIONS ARE APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL GENERAL NOTES FOUND ON SHEET G1.1.
3. EXISTING CULVERT, AT ENTRANCE, IS TO BE KEPT IN PLACE. CLEAN DITCH AT BOTH ENDS AND ADD AN 9 FEET LONG EXTENSION TO THE EAST SITE WITH END SECTION

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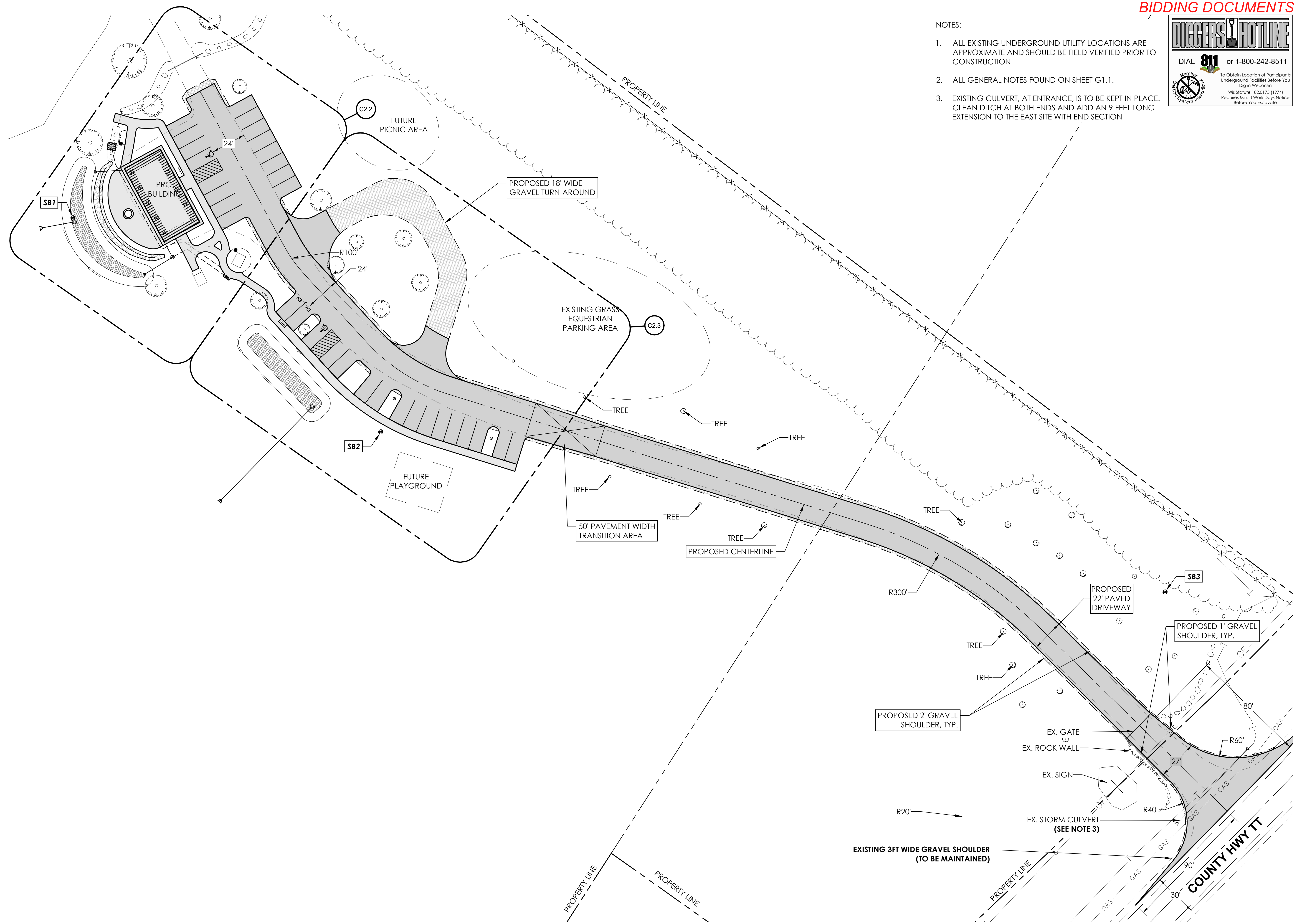

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PROPOSED SITE PLAN

McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

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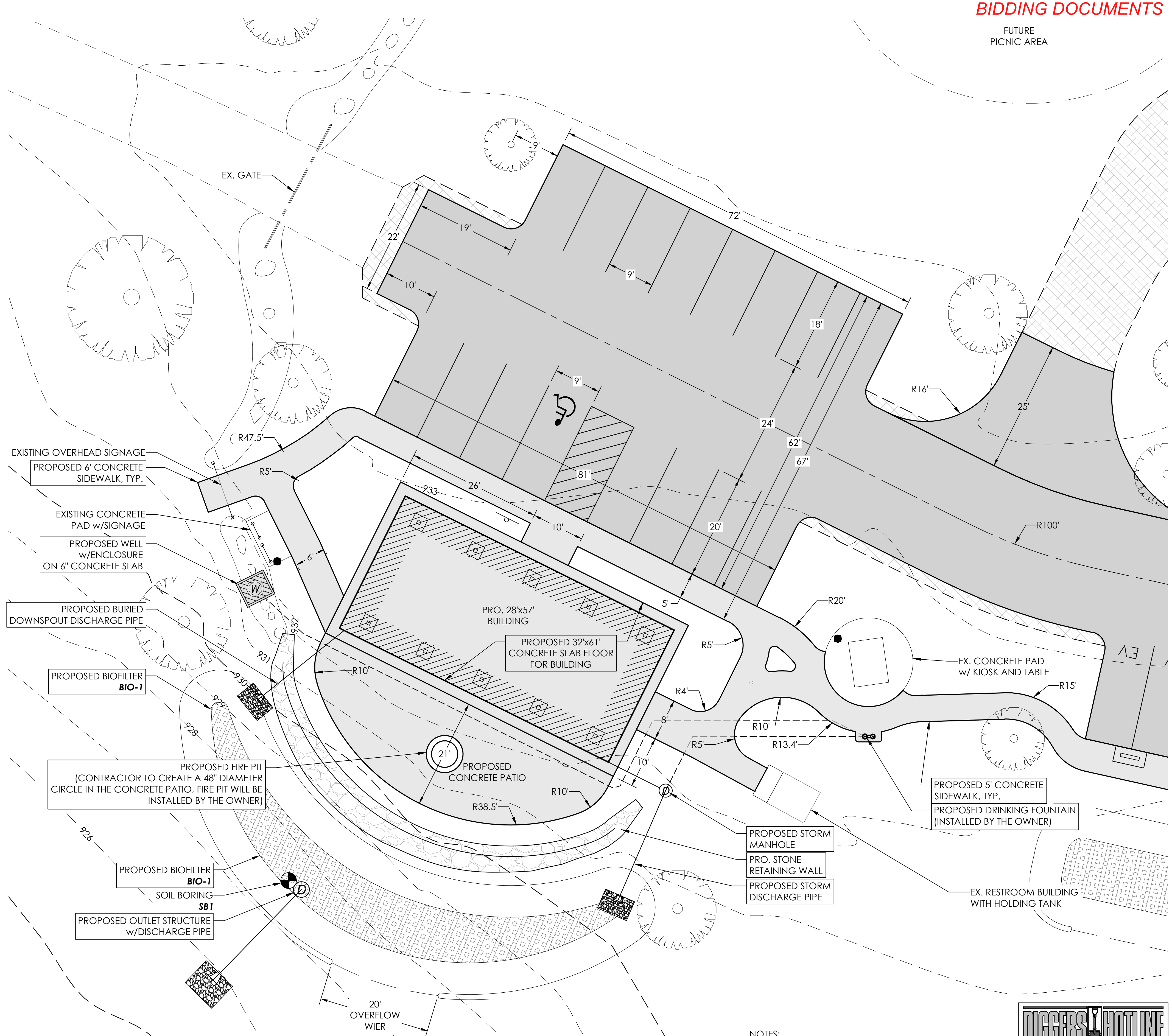

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PROPOSED SITE PLAN

McCARTHY PARK IMPROVEMENTS

DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

NO.	BY	DATE	REVISIONS

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SHEET NO.	C2.2

BIDDING DOCUMENTS

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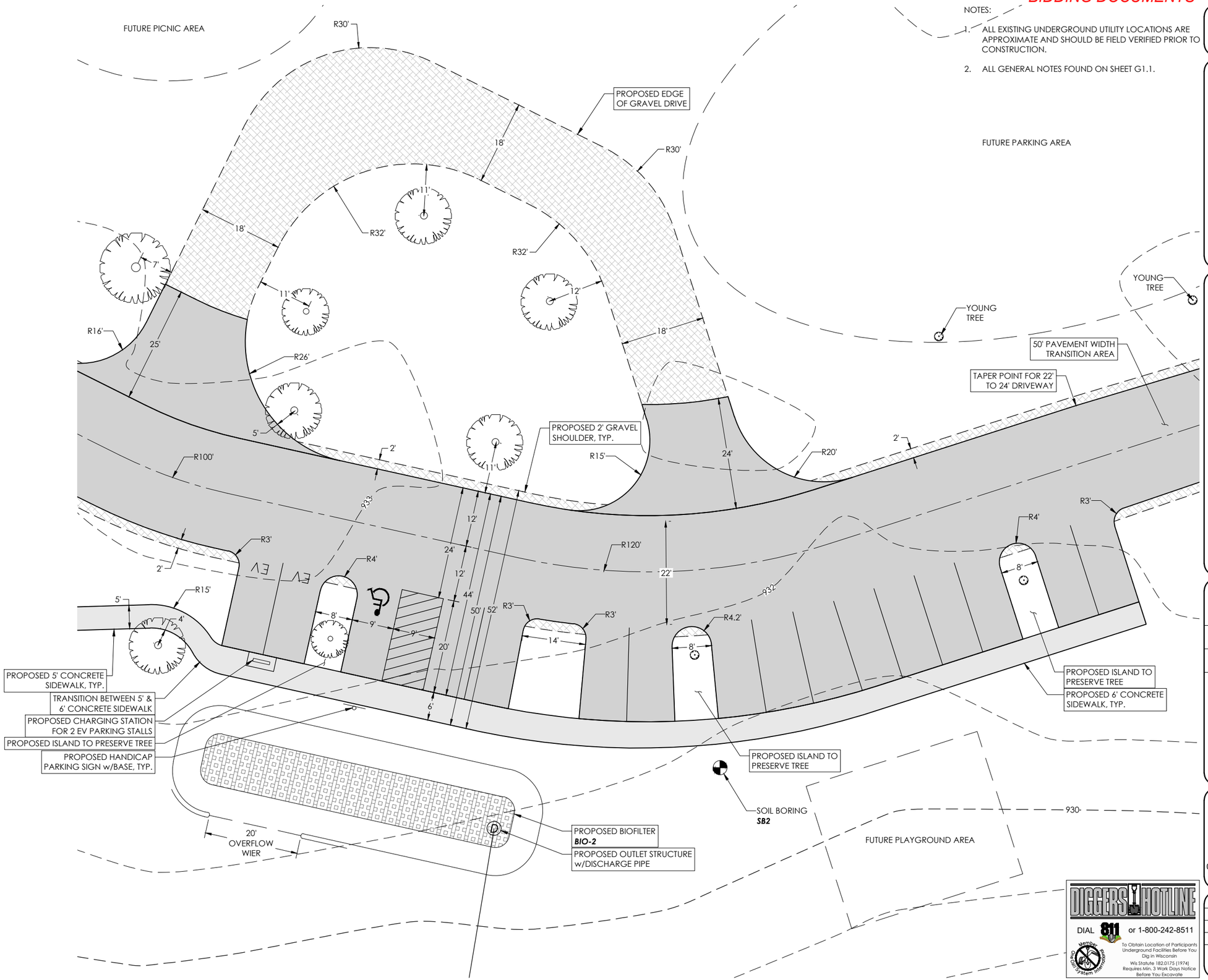

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PROPOSED SITE PLAN
McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

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DIGGERS HOTLINE
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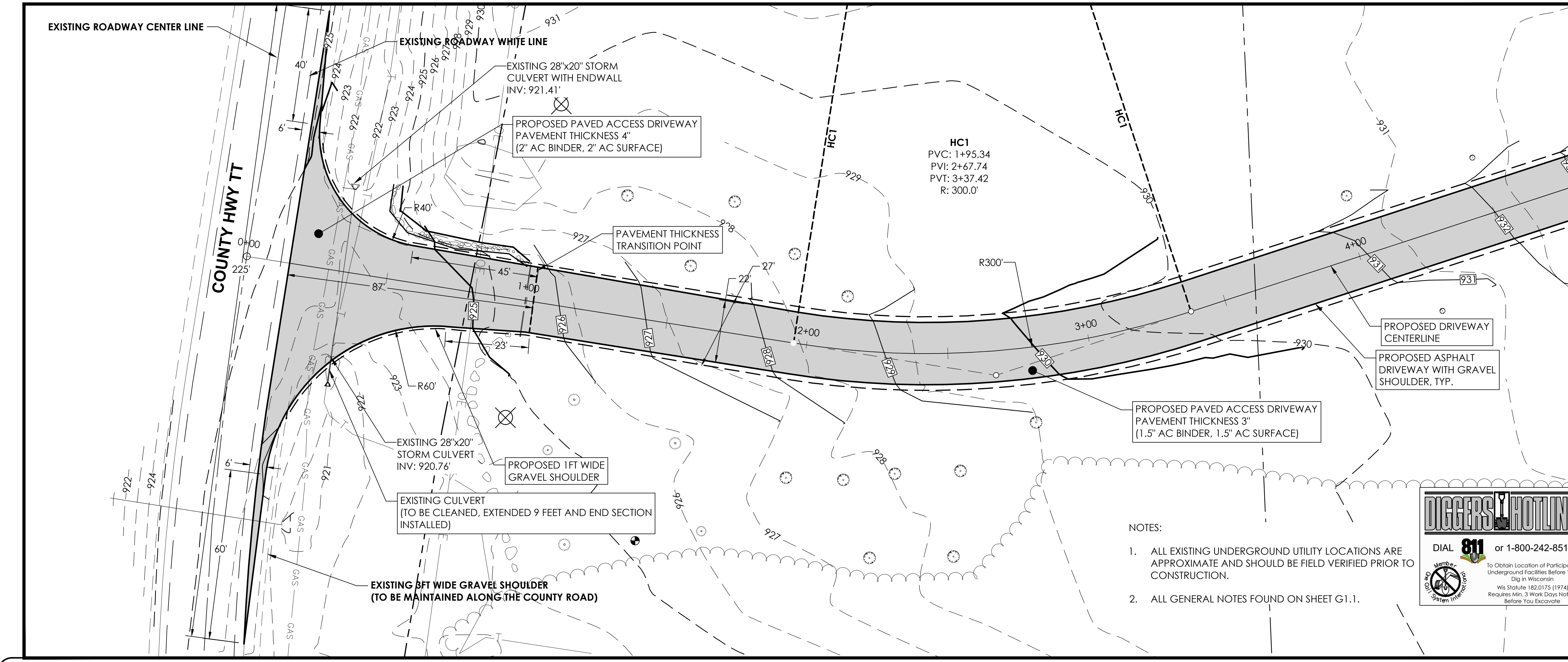
BIDDING DOCUMENTS



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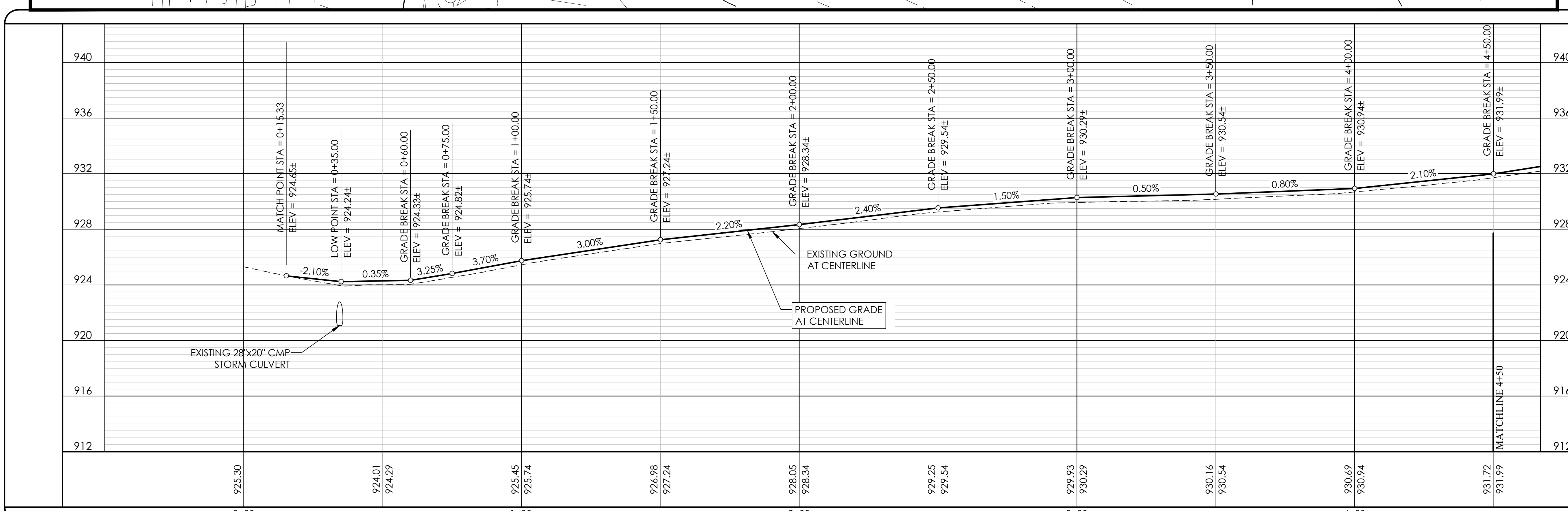

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PLAN & PROFILE

McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

NO.	BY	DATE	REVISIONS

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GEC FILE NO.	2-0321-169
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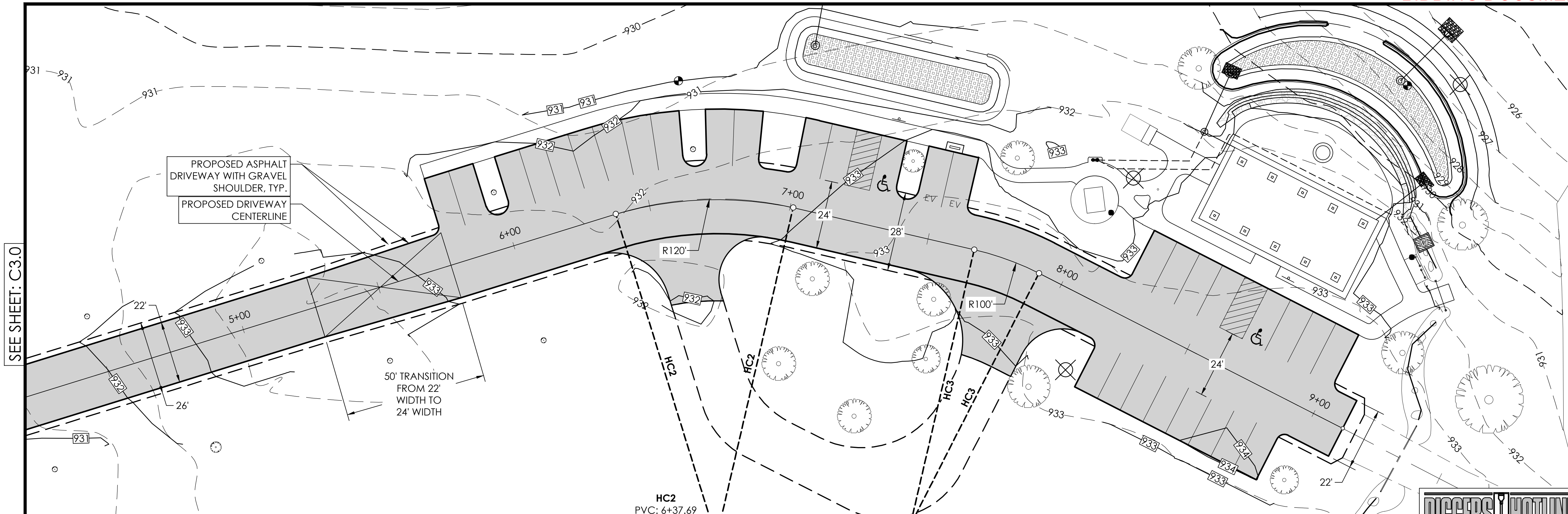

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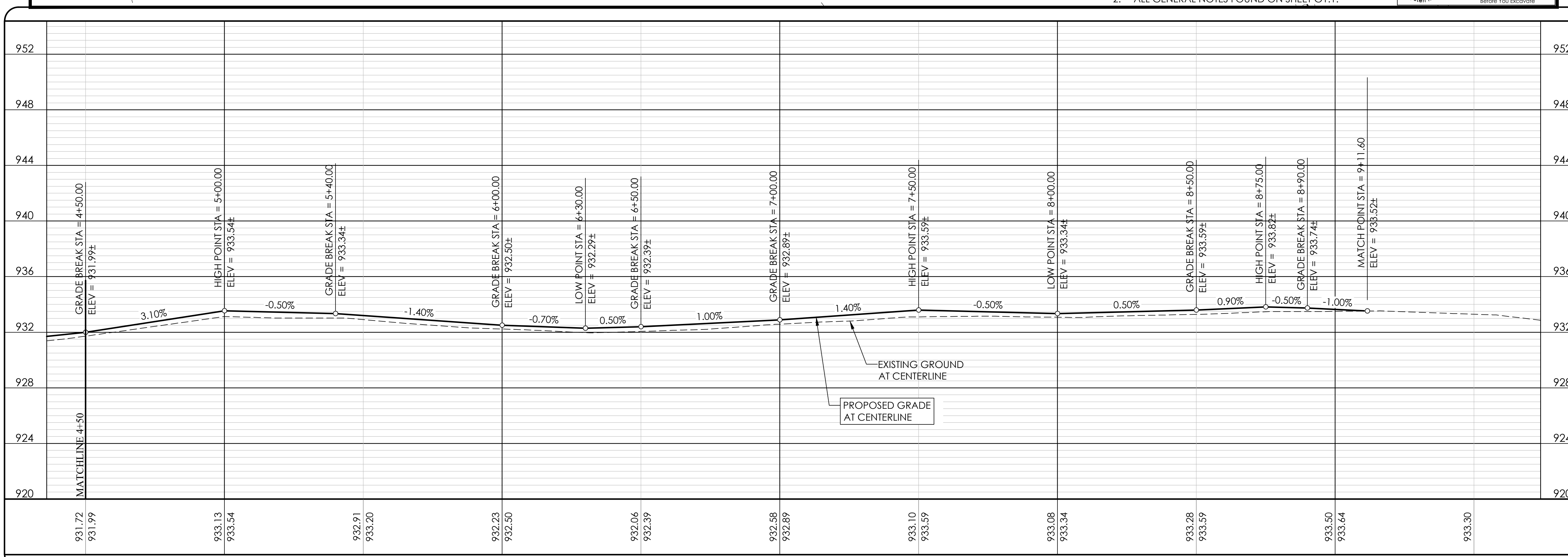

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PLAN & PROFILE

McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

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BIDDING DOCUMENTS

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PROPOSED SILT FENCE, TYP.
PROPOSED RIPRAP AT PIPE DISCHARGE
PROPOSED BIOFILTER *BIO-1*
PROPOSED RIPRAP AT PIPE DISCHARGE
PROPOSED BIOFILTER *BIO-2*
PROPOSED RIPRAP AT PIPE DISCHARGE
PROPOSED SILT FENCE, TYP.
PROPOSED SILT FENCE, TYP.
EXISTING 1' CONTOUR
PROPOSED 1' CONTOUR
PROPOSED STRAW WATTLES
COUNTY HWY TT

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GRADING & EROSION CONTROL
McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
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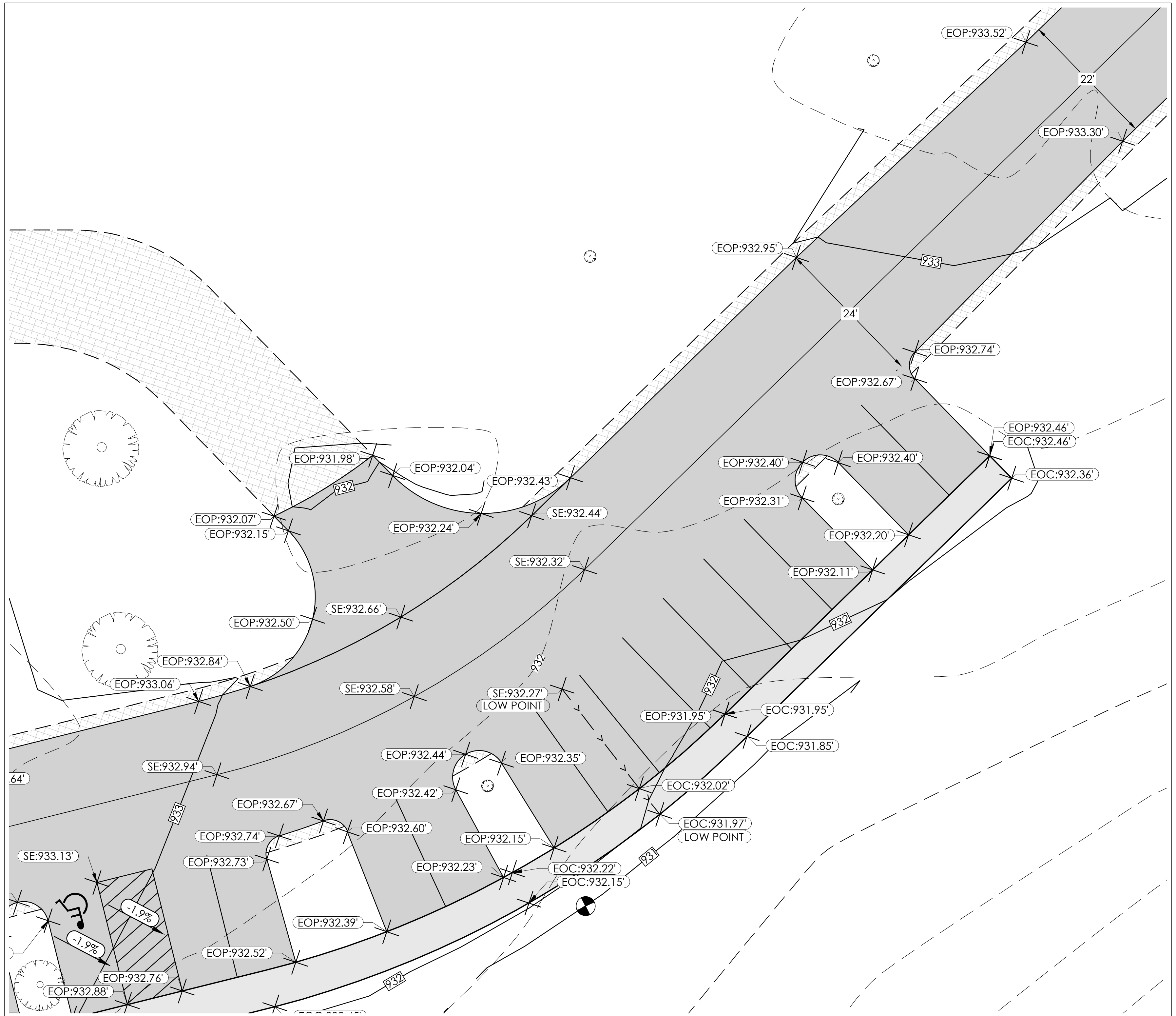
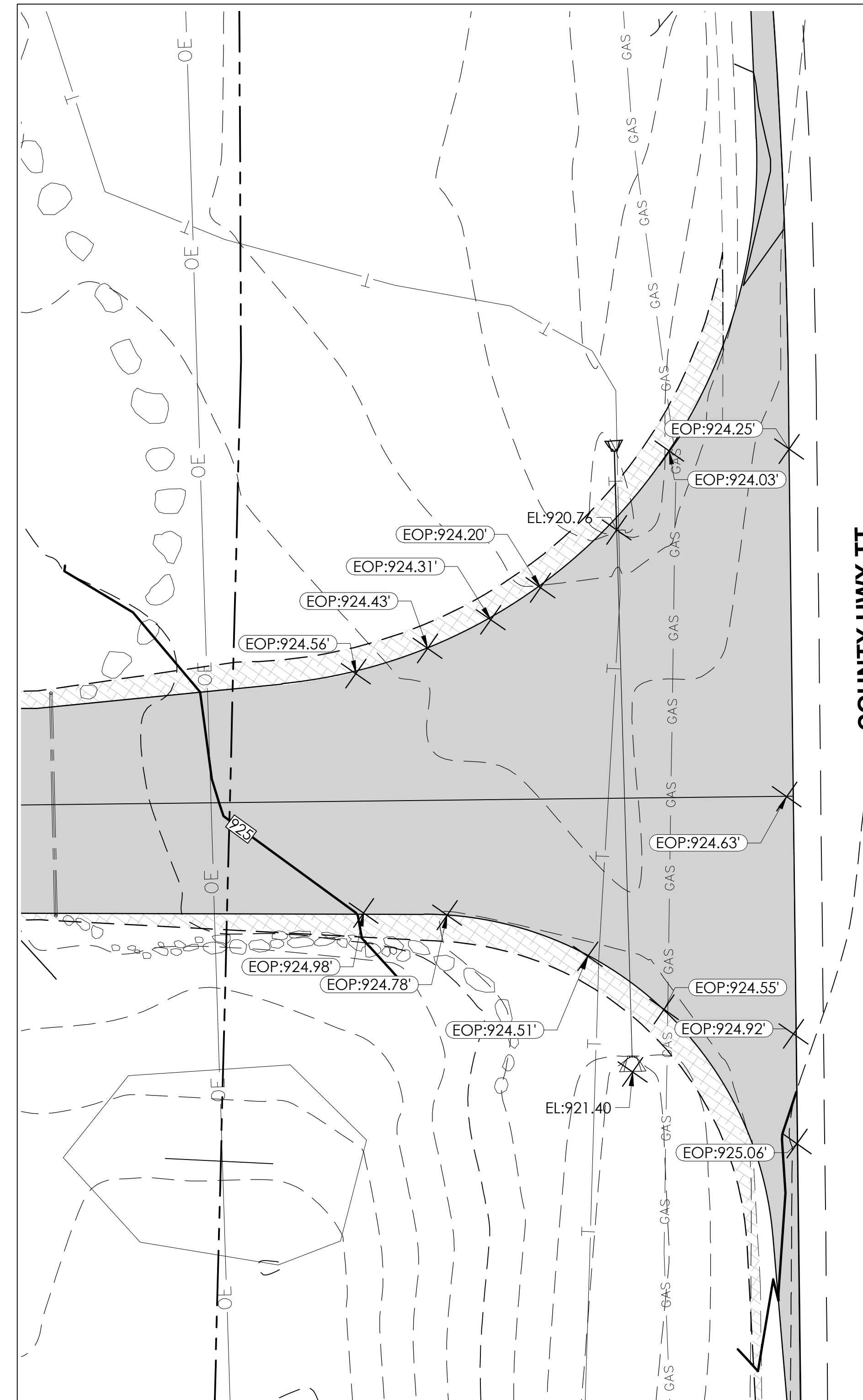


PARKING AREA PLAN VIEW

SCALE: AS SHOWN



ENTRANCE PLAN VIEW

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GRADING - SPOT ELEVATIONS

McCARTHY PARK IMPROVEMENTS DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

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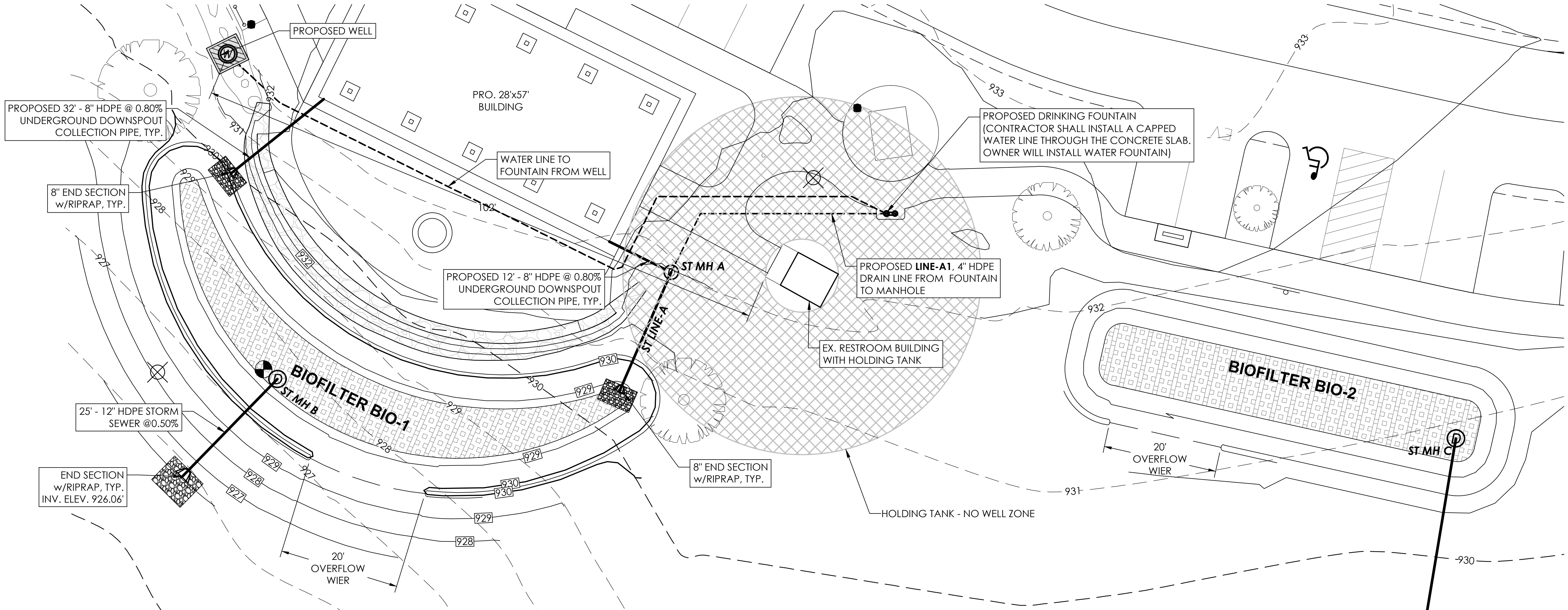
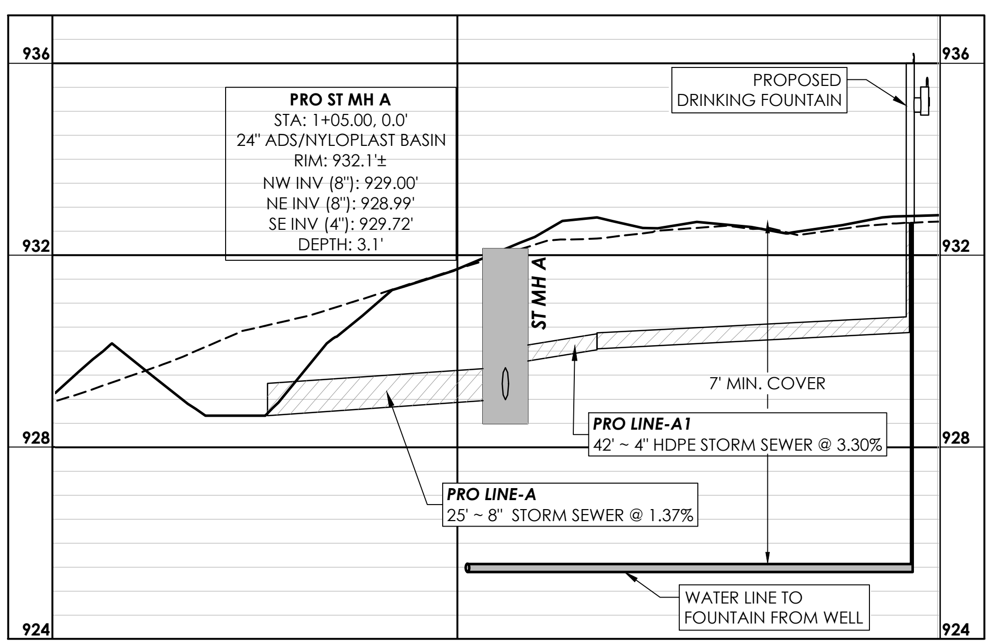


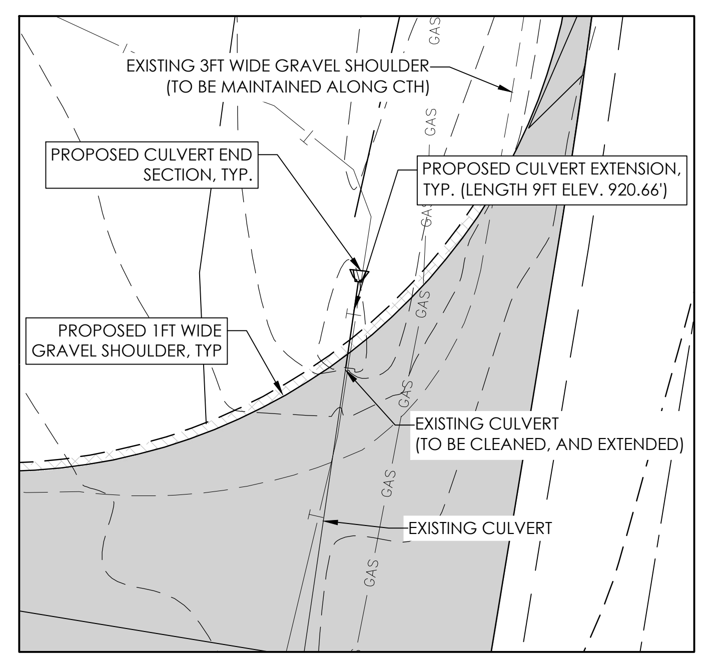
PLAN VIEW

SCALE: AS SHOWN



1 UTILITY PROFILE VIEW

SCALE: AS SHOWN



2 DRIVEWAY CULVERT PLAN

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UTILITY PLAN

McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

NO.	BY	DATE	REVISIONS

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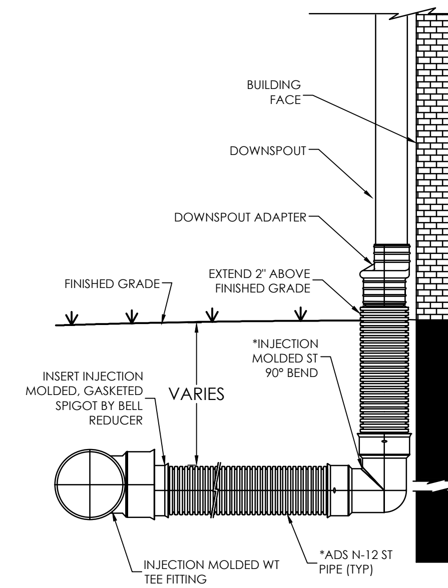
BIDDING DOCUMENTS

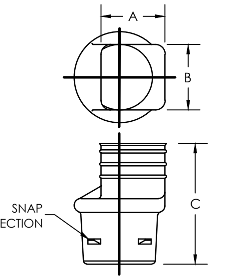
NOTES:
* INJECTION MOLDED FITTINGS ARE AVAILABLE IN TEES, WYES, REDUCERS, 45° BENDS AND BELL/BELL COUPLERS.
* WT INJECTION MOLDED FITTINGS AND WT PIPE CAN BE SUBSTITUTED FOR WATER TIGHT APPLICATIONS

CONSTRUCTION NOTES:
* BUILDING DOWNSPOUTS SHALL BE CONNECTED TO THE COLLECTION SYSTEM ABOVE GRADE.
* DOWNSPOUT COLLECTORS SHALL DOUBLE AS CLEAN OUTS & SHALL BE SPACED NO MORE THAN 100' APART.

ADVANCED DRAINAGE SYSTEMS, INC.

ADS STANDARD DETAILS DISCLAIMER:
"ADVANCED DRAINAGE SYSTEMS, INC. ("ADS") HAS PREPARED THIS STANDARD DETAIL TO DEMONSTRATE ADS' RECOMMENDED INSTALLATION OF ITS PRODUCTS FOR THE DEPICTED APPLICATION. IN ADDITION TO ADS' RECOMMENDATIONS, THERE MAY BE OTHER NATIONAL, STATE OR LOCAL SPECIFICATIONS THAT ARE PERTINENT TO THIS APPLICATION. ADS' STANDARD DETAIL IS NOT INTENDED TO SUPERSEDE ANY NATIONAL, STATE OR LOCAL SPECIFICATIONS, AND ADS RECOMMENDS THAT THOSE REQUIREMENTS BE REVIEWED AND CONSULTED PRIOR TO THE INSTALLATION OF ADS' PRODUCTS. ADS HAS NOT AUTHORIZED, AND IT BEARS NO RESPONSIBILITY FOR, ANY REVISIONS, ALTERATIONS OR DEVIATIONS FROM THIS STANDARD DETAIL."

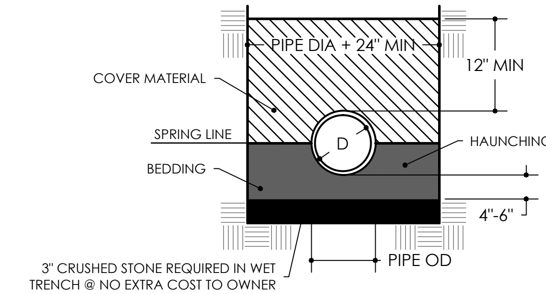




PART #	PIPE SIZE	A	B	C
0364AA	3 in (75 mm)	2.50 in (64 mm)	3.25 in (83 mm)	4.75 in (121 mm)
0464AA	4 in (100 mm)	2.50 in (64 mm)	3.25 in (83 mm)	4.75 in (121 mm)
0465AA	4 in (100 mm)	3.25 in (83 mm)	4.50 in (114 mm)	5.00 in (127 mm)
0466AA	4 in (100 mm)	2.56 in (65 mm)	2.56 in (65 mm)	4.63 in (117 mm)
0664AA	6 in (150 mm)	3.62 in (92 mm)	5.63 in (143 mm)	6.43 in (163 mm)
0664AC*	6 in (150 mm)	3.62 in (92 mm)	5.63 in (143 mm)	6.43 in (163 mm)

DOWNSPOUT ADAPTER

DOWNSPOUT COLLECTION DETAIL



BEDDING AND COVER MATERIAL:

CLASS IA: CRUSHED STONE OR GRAVEL CONFORMING TO FOLLOWING GRADATION:

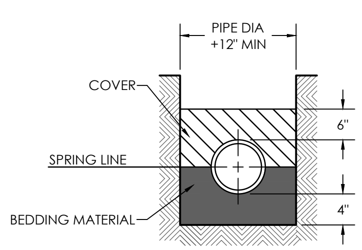
SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90-100
3/8"	20-55
NO. 4	0-10
NO. 8	0-5

CLASS IB: CRUSHED STONE OR GRAVEL CONFORMING TO FOLLOWING GRADATION:

SEIVE SIZE	% PASSING BY WEIGHT
1/2"	100
3/8"	85-100
NO. 4	10-30
NO. 8	0-5

INSTALLATION:
PLACE AND COMPACT BEDDING MATERIAL AND COVER IN MAXIMUM 6" LAYERS. WORK MATERIAL IN AND AROUND PIPE BY HAND TO PROVIDE UNIFORM SUPPORT. COMPACT CLASS IB WITH HAND TAMPER OR VIBRATORY COMPACTOR TO 85% STANDARD PROCTOR.

FLEXIBLE PIPE BEDDING
(CORRUGATED STEEL AND POLYETHYLENE)



INSTALLATION:
PLACE 4" OF BEDDING MATERIAL BENEATH PIPE. PLACE BEDDING MATERIAL AROUND THE PIPE TO THE SPRING LINE. WORK THE MATERIAL IN AND AROUND THE PIPE BY HAND TO PROVIDE UNIFORM SUPPORT. PLACE COVER MATERIAL CAREFULLY TO A LEVEL 6" ABOVE THE PIPE.

BEDDING AND COVER:
CLASS IA - CLEAN, ANGULAR CRUSHED STONE, CRUSHED ROCK, OR CRUSHED GRAVEL CONFORMING TO THE FOLLOWING GRADATION:

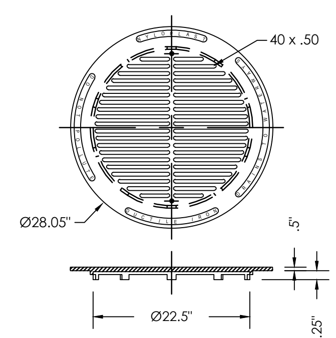
SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90-100
3/8"	20-55
NO. 4	0-10
NO. 8	0-5

CLASS IB- CLEAN, ANGULAR CRUSHED STONE, CRUSHED ROCK, OR CRUSHED GRAVEL CONFORMING TO THE FOLLOWING GRADATION:

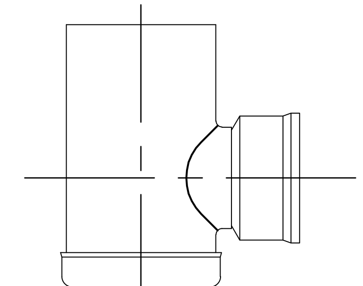
SIEVE SIZE	% PASSING BY WEIGHT
1/2"	100
3/8"	85-100
NO. 4	10-30
NO. 200	0-5

CLASS II- CLEAN COARSE-GRAINED SOILS CLASSIFIED IN ASTM D2487 AS GW, GP, SW, SP.
CLASS III- COARSE-GRAINED SOILS WITH FINES CLASSIFIED IN ASTM D2487 AS GM, GC, SM, SC.

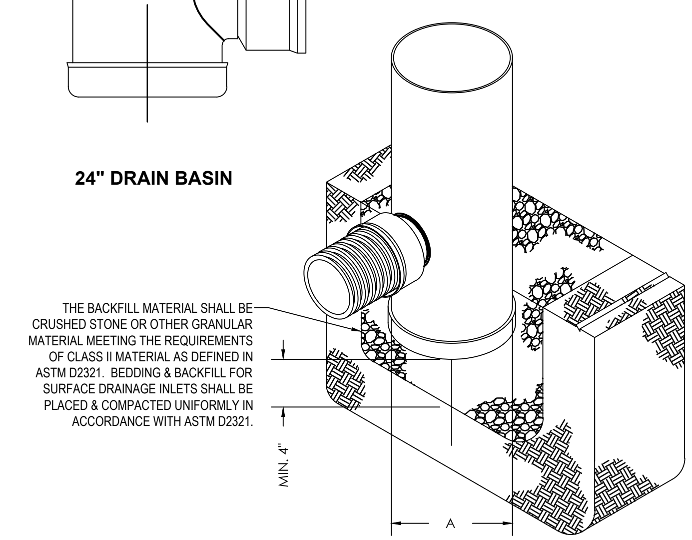
STANDARD WATER MAIN TRENCH



DROP-IN GRATE

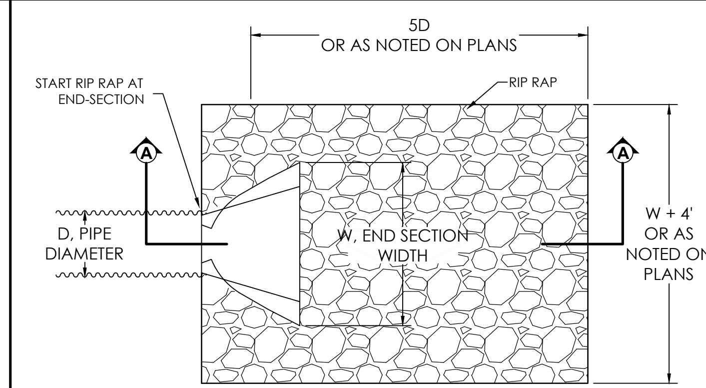


24" DRAIN BASIN

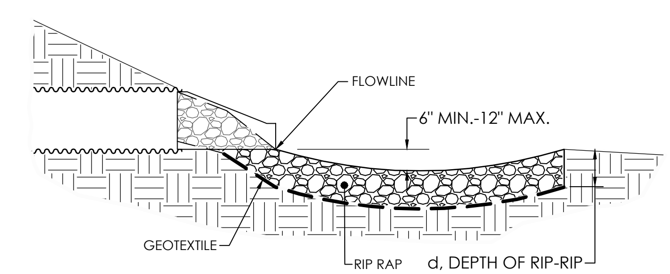


A	PART #	GRATE OPTIONS					
8"	2808AG	PEDESTRIAN/STANDARD		SOLID	BRONZE	DOME	DROP IN
10"	2810AG	PEDESTRIAN/STANDARD		SOLID	BRONZE	DOME	DROP IN
12"	2812AG	PEDESTRIAN	STANDARD	SOLID	BRONZE	DOME	DROP IN
15"	2815AG	PEDESTRIAN	STANDARD	SOLID	BRONZE	DOME	DROP IN
18"	2818AG	PEDESTRIAN	STANDARD	SOLID	N/A	DOME	DROP IN
24"	2824AG	PEDESTRIAN	STANDARD	SOLID	N/A	DOME	DROP IN
30"	2830AG	PEDESTRIAN	STANDARD	SOLID	N/A	DOME	N/A

TYPICAL ADS / NYLOPLAST MANHOLE DETAILS



PLAN VIEW



SECTION A-A

CMP/HDPE PIPE

RIP RAP CLASS	WIS DOT RIP RAP EQUIVALENT	d, DEPTH
1	--	9"
2	LIGHT	18"
3	HEAVY	27"
4	EXTRA HEAVY	36"

RIP RAP AT PIPE DISCHARGE

WATER MAIN

STORM SEWER

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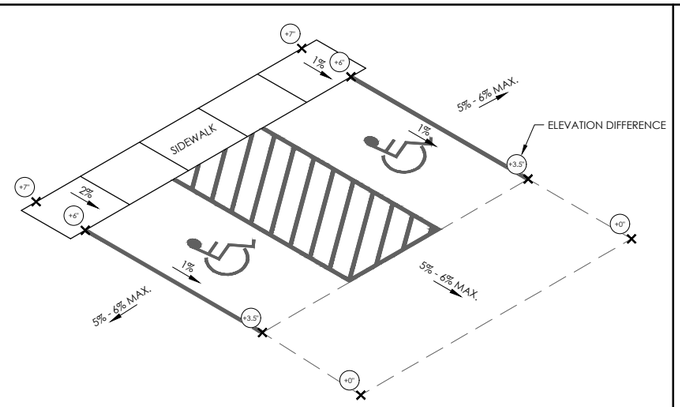
CONSTRUCTION DETAILS
McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

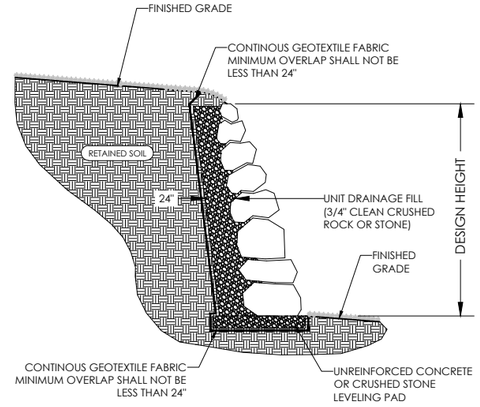
REVISIONS	NO.	BY	DATE

SCALE

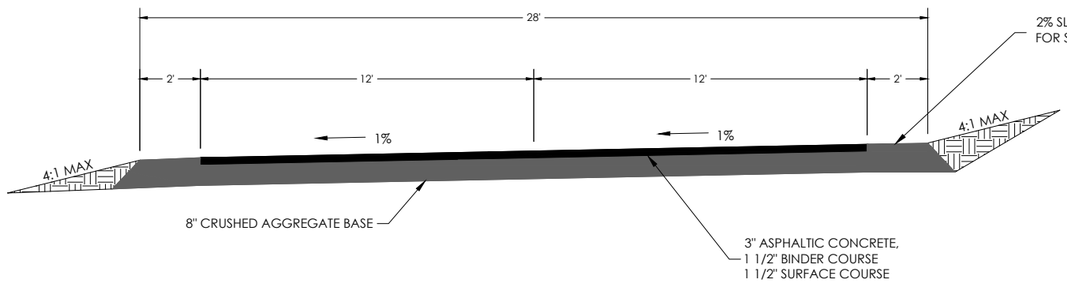
DRAWN BY	SRR
REVIEWED BY	LAL
ISSUE DATE	OCT. 2021
GEC FILE NO.	2-0321-169
SHEET NO.	C6.0



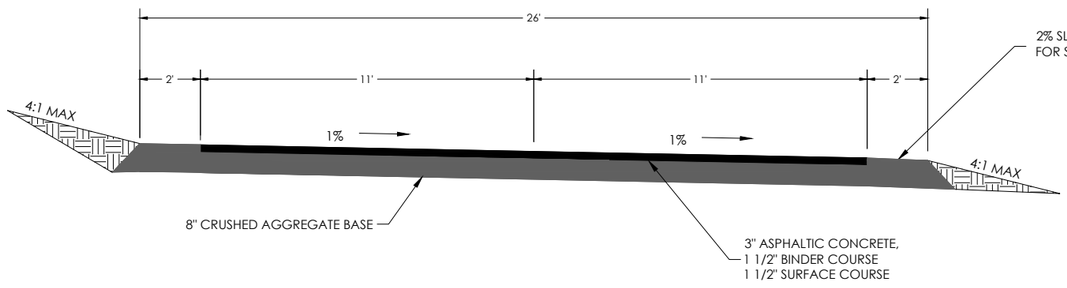
TYPICAL ACCESSIBLE PARKING DETAILS



TYPICAL STONE WALL DETAILS

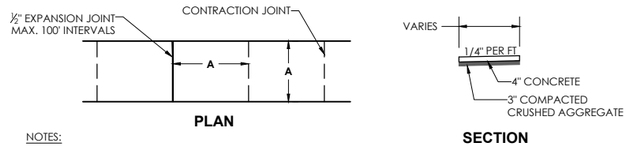


1% CROSS SLOPE TO WEST



1% CROSS SLOPE TO EAST

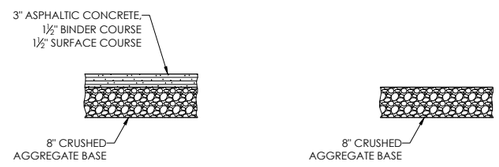
TYPICAL STREET SECTIONS



NOTES:

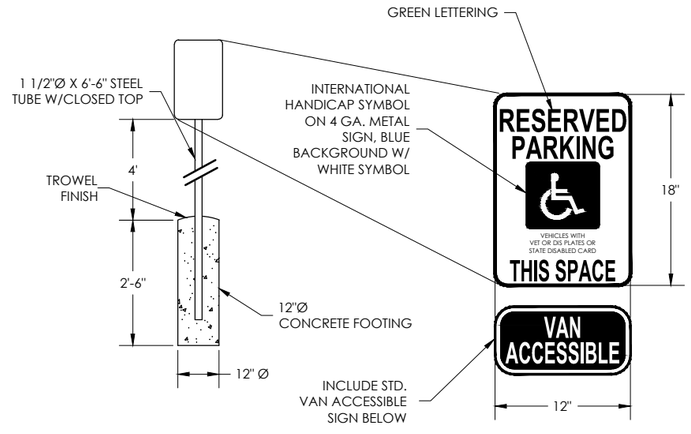
1. **A** = 5' TYPICALLY
   (SEE PLANS FOR PROPOSED WIDTH)
2. AREA BETWEEN CURB AND SIDEWALK IS TO HAVE A MINIMUM OF 6" DIFFERENCE IN ELEVATION, UNLESS NOTED OTHERWISE ON THE PLANS.

TYPICAL SIDEWALK DETAIL



ASPHALT **GRAVEL**

TYPICAL PAVING DETAILS



TYPICAL ACCESSIBLE PARKING SIGN

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CONSTRUCTION DETAILS
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DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
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SHEET NO.	C6.1

BIDDING DOCUMENTS

NOTES

TEMPORARY DITCH CHECKS

PURPOSE & OPERATION

PRODUCTS IN THIS CATEGORY ARE INTENDED FOR USE AT THE BOTTOM OF FILL SLOPES AND IN CHANNELS TO INTERCEPT AND POND SEDIMENT-LADEN RUNOFF. PONDING THE WATER REDUCES THE VELOCITY OF THE INCOMING FLOW AND ALLOWS MOST OF THE SEDIMENTS TO SETTLE OUT. WATER EXITS THE CHECK BY EITHER FILTERING THROUGH OR FLOWING OVER THE TOP.

CONSTRUCTION METHODS

THIS WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION FOR HIGHWAY AND STRUCTURE CONSTRUCTION, AND THE STANDARD DETAIL DRAWING IN THE WISDOT FACILITY DEVELOPMENT MANUAL. IN ADDITION TO THE ABOVE, TEMPORARY DITCH CHECKS SHALL BE PLACED PERPENDICULAR TO THE FLOW LINE OF THE DITCH AND SHALL EXTEND FAR ENOUGH SO THAT THE GROUND LEVEL AT THE ENDS OF THE CHECKS ARE HIGHER THAN THE LOW POINT ON THE CREST OF THE CHECK. THE INSTALLED MATERIAL SHALL HAVE A MINIMUM HEIGHT OF 10 INCHES ABOVE THE FLOW LINE IN THE INSTALLED CONDITION. ALL PRODUCTS SHALL BE ENTRENCHED A MINIMUM OF 2.0 INCHES ON BARE SOIL. DITCH CHECKS INSTALLED IN A CHANNEL THAT IS CONTINUOUSLY LINED WITH EROSION MAT NEED NOT BE ENTRENCHED IF INSTALLED OVER THE TOP OF THE EROSION MAT. INSTALLATIONS SHALL HAVE STAKES ON THE DOWNSTREAM SIDE OF THE TEMPORARY DITCH CHECK AND SHALL NOT REDUCE THE HEIGHT OF THE TEMPORARY DITCH CHECK. FABRIC TYPE PRODUCTS MAY BE ENTRENCHED WITH A NARROW CHECK SLOT ON THE UPSTREAM SIDE.

APPROVED MANUFACTURED ALTERNATIVES TO THE DEPARTMENT'S DETAILS ARE LISTED BELOW.

APPROVED TEMPORARY DITCH CHECKS

PRODUCT	MANUFACTURER
CURLEX 12 INCH SEDIMENT LOG	AMERICAN EXCELSIOR
CURLEX 20 INCH SEDIMENT LOG	AMERICAN EXCELSIOR
AEC PREMIER 12 INCH WATTLE	AMERICAN EXCELSIOR
AEC PREMIER 20 INCH WATTLE	AMERICAN EXCELSIOR
STENLOG 12	Erosion Control Blanket.com
TRIANGULAR SILT DIKE	TRIANGULAR SILT DIKE
ASPEN XCEL EXCELSIOR LOG	WESTERN EXCELSIOR
DITCH CHEXX	FILTREXX
BIO-D SILT CHECK	RO LANKA
WS-12	NORTH AMERICAN GREEN

INSTALLATION INSTRUCTIONS - LOGS AND WATTLES:

STEP 1 - SITE PREPARATION

PREPARE SITE TO DESIGN PROFILE AND GRADE. REMOVE DEBRIS, ROCKS, CLODS, ETC. GROUND SURFACE SHOULD BE SMOOTH PRIOR TO INSTALLATION TO ENSURE LOG REMAINS IN CONTACT WITH SLOPE.

STEP 2 - STAPLE SELECTION

AT A MINIMUM, 1" LONG BY 1" BY 24", STAKES ARE TO BE USED TO SECURE THE LOG TO THE GROUND SURFACE. INSTALLATION IN ROCKY, SANDY OR OTHER LOOSE SOIL MAY REQUIRE LONGER STAKES.

SLOPE INSTALLATION

PLACE RECP ALONG SLOPE TO PROVIDE UPSTREAM APRON FOR LOG. SECURE RECP ACCORDING TO STANDARD SLOPE INSTALLATION INSTRUCTIONS INCLUDING UPSTREAM ANCHOR TRENCH. SECURE LOG TO BLANKET, ENSURING LOG REMAINS IN INTIMATE CONTACT WITH THE RECP OVER THE LENGTH OF THE INSTALLATION. A MINIMUM ONE FOOT UPSTREAM APRON AND TWO FOOT DOWNSTREAM APRON ARE REQUIRED FOR INSTALLATION. SUBSEQUENT, DOWNSLOPE ROWS OF LOGS SHOULD BE SPACED APPROPRIATELY FOR SITE CONDITIONS TO MINIMIZE ACCELERATION OF FLOW. FURTHER, LOG SEAMS ARE TO BE OFFSET TO ENSURE CONTINUOUS FILTRATION. FIGURE A PRESENTS A SCHEMATIC OF A SLOPE INSTALLATION IN PROFILE VIEW.

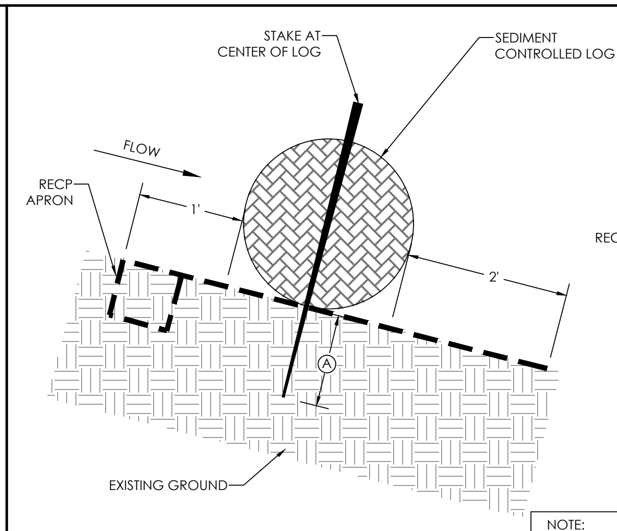
CHANNEL INSTALLATION

PLACE RECP ALONG CHANNEL TO PROVIDE UPSTREAM AND DOWNSTREAM APRON FOR LOG IDENTICALLY TO SLOPE INSTALLATION. SECURE LOG TO BLANKET, ENSURING LOG REMAINS IN INTIMATE CONTACT WITH THE RECP OVER THE LENGTH OF THE INSTALLATION. A MINIMUM OF ONE FOOT UPSTREAM APRON AND TWO FOOT DOWNSTREAM APRON ARE REQUIRED FOR INSTALLATION. SUBSEQUENT, DOWNSLOPE ROWS OF LOGS SHOULD BE SPACED APPROPRIATELY FOR SITE CONDITIONS TO MINIMIZE ACCELERATION OF FLOW. FURTHER, LOG SEAMS ARE TO BE OFFSET TO ENSURE CONTINUOUS FILTRATION. FIGURE A AND FIGURE C PRESENT A SCHEMATIC OF A CHANNEL INSTALLATION.

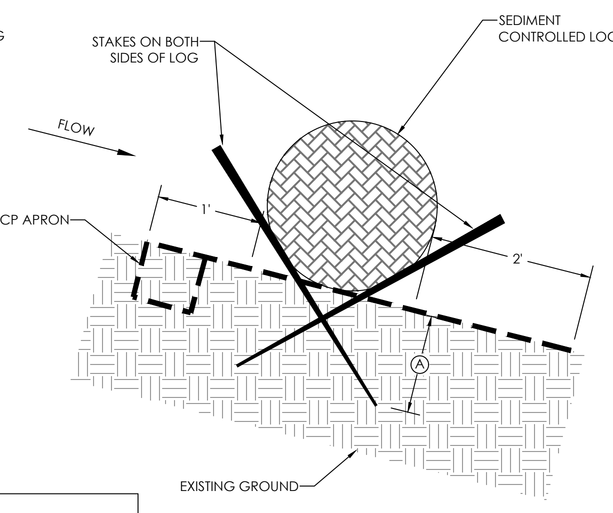
DRAIN FILTER INSTALLATION

SURROUND DRAIN INLET TO BE PROTECTED WITH LOG, ENSURING SEAMS ARE OVERLAPPING TO MINIMIZE FLOW CIRCUMVENTING LOG. SECURE LOGS TO GROUND SURFACE ENSURING THE LOG REMAINS IN INITIMATE CONTACT WITH THE GROUND SURFACE OVER THE ENTIRE INSTALLATION. PROVIDE RECP APRON SECURED TO THE GROUND SURFACE BETWEEN DRAIN AND LOG.

SLOPE/CHANNEL INSTALLATION (FIG. A)

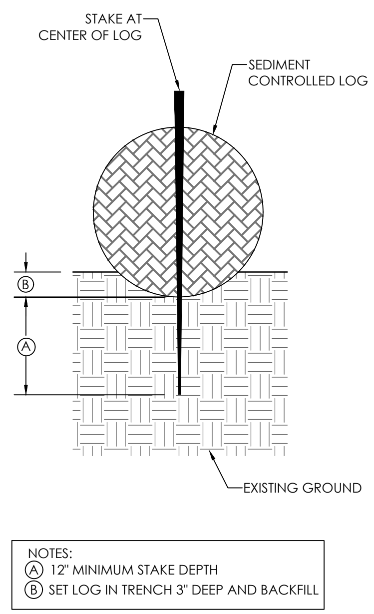


ONE-STAKE SECTION



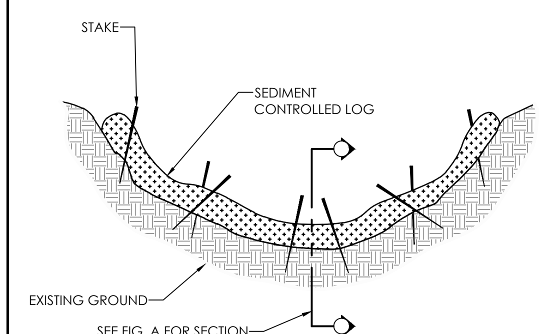
TWO-STAKE SECTION

FLAT GROUND INSTALLATION (FIG. B)



SECTION

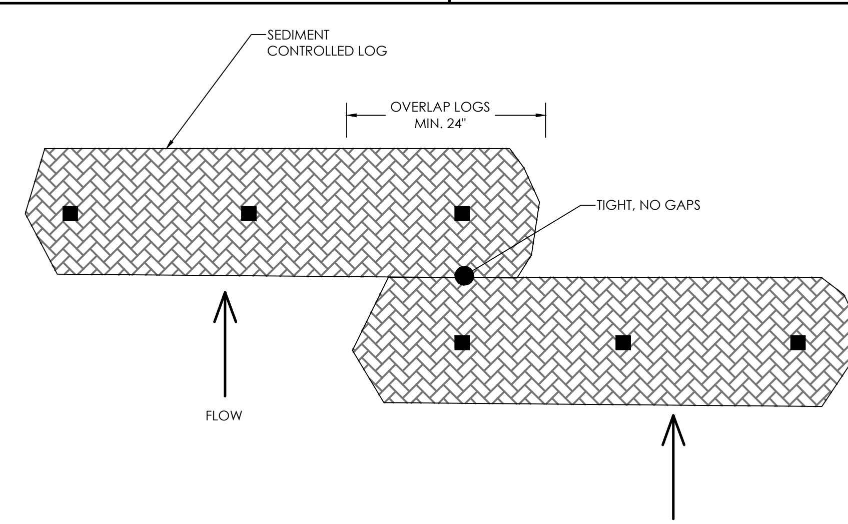
CHANNEL INSTALLATION (FIG. C)



DO NOT ALLOW FLOW TO OVERTOP INSTALLATION.

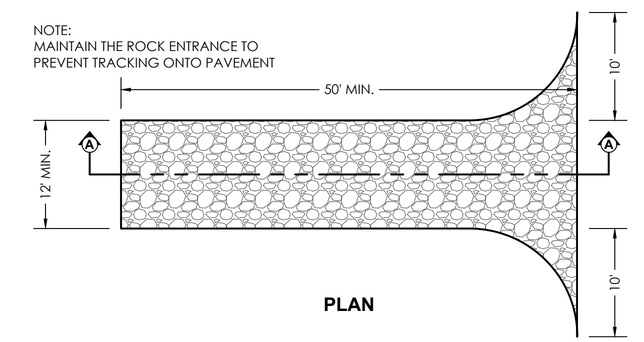
CROSS-SECTION VIEW

LOG OVERLAP DETAIL

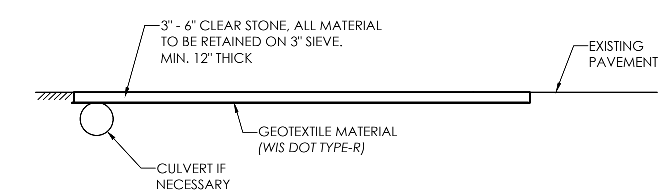


PLAN VIEW

ROCK CONSTRUCTION ENTRANCE

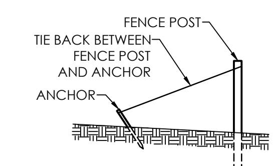


PLAN

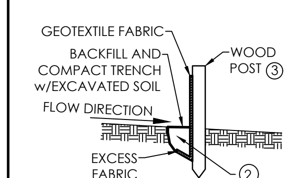


SECTION A-A

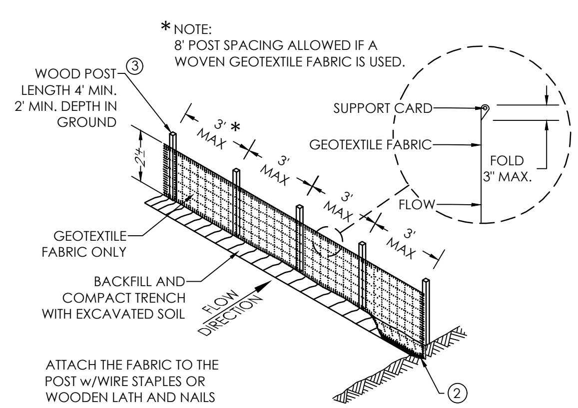
SILT FENCE



TIE BACK DETAIL
WHEN REQUIRED BY ENGINEER



TRENCH DETAIL



ISOMETRIC

NOTES:
1. HORIZONTAL BRACE WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POST AS DIRECTED BY THE ENGINEER.
2. TRENCH SHALL BE A MINIMUM OF 4" WIDE BY 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC, FOLD MATERIAL TO FIT TRENCH AND BACKFILL AND COMPACT TRENCH WITH EXCAVATED SOIL.
3. WOOD POST SHALL BE A MINIMUM SIZE OF 1 1/8" X 1 1/8" OF OAK OR HICKORY.

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EROSION CONTROL DETAILS
McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

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SHEET NO.	C6.2

CONSTRUCTION SITE EROSION CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. FURNISHING, INSTALLING, MAINTAINING, AND REMOVING EROSION AND SEDIMENT CONTROL FACILITIES AND MEASURES.

B. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL EROSION CONTROL FACILITIES AND MEASURES NECESSARY TO CONTROL EROSION AND SEDIMENTATION AT THE WORK SITE. THESE FACILITIES AND MEASURES MAY OR MAY NOT BE SHOWN ON THE DRAWINGS AND THEIR ABSENCE ON THE DRAWINGS DOES NOT ALLEVIATE THE CONTRACTOR FROM PROVIDING THEM. ANY MEASURES AND FACILITIES SHOWN ON THE DRAWINGS ARE THE MINIMUM ACTIONS REQUIRED.

1.02 REFERENCES

A. WDNR TECHNICAL STANDARDS - SEE DNR WEBSITE @ *http://dnr.state.wi.us/org/water/wm/nps/stormwater/techstds.htm*

B. WISCONSIN DEPARTMENT OF TRANSPORTATION, EROSION CONTROL, PRODUCT ACCEPTABILITY LISTS FOR MULTI-MODAL APPLICATIONS PAL, CURRENT EDITION.

1.03 GENERAL

A. REQUIREMENTS OF WDNR TECHNICAL STANDARDS SHALL BE FOLLOWED AT ALL TIMES.

B. USE SURFACE WATER AND EROSION CONTROL FACILITIES AND MEASURES THROUGHOUT THE DURATION OF THE CONSTRUCTION ACTIVITY TO CONTROL THE MOVEMENT OF SURFACE WATER AND TO REDUCE THE POTENTIAL FOR EROSION. MAINTAIN THE FACILITIES AND MEASURES UNTIL PERMANENT VEGETATION IS ESTABLISHED.

C. ERODED SOIL MATERIAL SHALL NOT BE ALLOWED TO LEAVE THE CONSTRUCTION SITE OR TO ENTER A WATERWAY, LAKE, OR WETLAND.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING, INSTALLING, AND MAINTAINING THE EROSION CONTROL FACILITIES, AND IN GENERAL, SHALL USE CONSTRUCTION PRACTICES THAT MINIMIZE EROSION.

E. ERODED MATERIAL THAT HAS LEFT THE CONSTRUCTION SITE SHALL BE COLLECTED AND RETURNED TO THE SITE BY THE CONTRACTOR.

F. PREVENT CONSTRUCTION SITE TRACKING WITH GRAVELED ROADS, ACCESS DRIVES, AND PARKING AREAS OF SUFFICIENT WIDTH AND LENGTH TO PREVENT SEDIMENT FROM BEING TRACKED ONTO PUBLIC AND PRIVATE ROADWAYS. ANY SEDIMENT REACHING A PUBLIC OR PRIVATE ROAD SHALL BE REMOVED BY STREET CLEANING (NOT FLUSHING) BEFORE THE END OF EACH WORKDAY.

1.04 SEQUENCING AND SCHEDULING

A. CONSTRUCT AND STABILIZE EROSION CONTROL MEASURES FOR DIVERSIONS OR OUTLETS PRIOR TO ANY GRADING OR DISTURBANCE OF THE CONSTRUCTION SITE.

B. INSTALL FILTER FABRIC AND STRAW BALE FENCES AND BARRIERS PRIOR TO DISTURBING THE AREA.

C. TURF AREAS THAT HAVE BEEN COMPLETED TO FINISH GRADE SHALL BE STABILIZED WITH PERMANENT SEEDING WITHIN SEVEN DAYS. TURF AREAS WHERE ACTIVITY HAS CEASED AND THAT WILL REMAIN EXPOSED FOR MORE THAN 20 DAYS BEFORE ACTIVITY RESUMES AND SOIL STOCKPILES SHALL BE STABILIZED WITH TEMPORARY SEEDING OR SOIL STABILIZER.

D. OTHER EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO DISTURBANCE OF THE CONSTRUCTION SITE, AS APPLICABLE.

PART 2 - PRODUCTS

2.01 SILT FENCE

- FABRIC SHALL BE SHALL A WOVEN OR NONWOVEN POLYESTER, POLYPROPYLENE, STABILIZED NYLON, OR POLYETHYLENE GEOTEXTILE WITH THE FOLLOWING MINIMUM PROPERTIES:

PROPERTY	*TEST METHOD*	*REQUIREMENT**
GRAB TENSILE STRENGTH, LBS MIN. MACHINE DIRECTION CROSS DIRECTION	ASTM D 4632	 120 100
MAX. APPARENT OPENING SIZE, US SIEVE	ASTM D 4751	NO. 30
PERMITTIVITY, SEC-1, MIN.	ASTM D 4491	0.05
MIN. UV STABILITY AT 500 HRS, %	ASTM D 4355	70%

* MINIMUM OR MAXIMUM AVERAGE ROLL VALUES.

2.02 STRAW BALES

A. STRAW OR HAY BALES IN GOOD CONDITION WITH NOMINAL DIMENSIONS OF 14" W x 18"H x 30"L.

B. STAKES: WOOD STAKES WITH MINIMUM DIMENSION OF 2" x 2" x 30".

2.03 SEDIMENT LOGS

A. WOOD EXCELSIOR LOG WRAPPED IN BIODEGRADABLE FABRIC OR MESH AND LISTED IN THE EROSION CONTROL PRODUCT ACCEPTABILITY LISTS.

B. STAKES: WOOD STAKES WITH MINIMUM DIMENSION OF 1" x 1" x 24".

2.04 TEMPORARY SEED

A. AREAS NEEDING PROTECTION DURING PERIODS WHEN PERMANENT SEEDING IS NOT APPLIED SHALL BE SEEDED WITH ANNUAL SPECIES FOR TEMPORARY PROTECTION. PROVIDE SPECIES AS FOLLOWS:

SPECIES	% PURITY
OATS	98
CEREAL RYE	97
WINTER WHEAT	95
ANNUAL RYEGRASS	97

B. PROVIDE OATS FOR SPRING AND SUMMER. PROVIDE CEREAL RYE, WINTER WHEAT, OR ANNUAL RYEGRASS FOR FALL SEEDING.

2.05 EROSION MAT

A. ALL EROSION MAT PRODUCTS SHALL BE OF THE CLASS AND TYPE INDICATED AND SHALL BE CHOSEN FROM THE EROSION CONTROL PRODUCT ACCEPTABILITY LISTS.

B. CLASS I: A SHORT-TERM DURATION (SIX MONTHS OR GREATER), LIGHT DUTY, ORGANIC MAT. NETTING SHALL BE ORGANIC, PHOTODEGRADABLE PLASTIC OR BIODEGRADABLE NETTING. THE WEIGHT OF THE NETTING SHALL NOT EXCEED 15% OF THE TOTAL BLANKET WEIGHT. THE NETTING SHALL BE SUFFICIENTLY BONDED TO THE PARENT MATERIAL TO PREVENT SEPARATION FOR THE LIFE OF THE PRODUCT.
   1. TYPE A: A NETTED PRODUCT FOR USE ON SLOPES 2.5 TO 1 OR FLATTER WITH A MINIMUM PRODUCT PERMISSIBLE SHEAR STRESS OF 50 PA (1.0 LBS/FT2). NOT TO BE USED IN CHANNELS.
   2. TYPE B: A DOUBLE NETTED PRODUCT FOR USE ON SLOPES 2 TO 1 OR FLATTER OR IN CHANNELS WITH A MINIMUM PRODUCT PERMISSIBLE SHEAR STRESS OF 70 PA (1.5 LBS/FT2).

C. CLASS II: A LONG-TERM DURATION (3 YEARS OR GREATER), ORGANIC MAT. THE WEIGHT OF THE NETTING SHALL NOT EXCEED 15% OF THE TOTAL BLANKET WEIGHT. THE NETTING SHALL BE BONDED SUFFICIENTLY TO THE PARENT MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL FOR THE LIFE OF THE PRODUCT.
   1. TYPE A: JUTE FIBER ONLY TO BE USED FOR REINFORCING SOD.
   2. TYPE B: FOR USE ON SLOPES 2:1 OR FLATTER, OR IN CHANNELS WITH A MINIMUM PRODUCT PERMISSIBLE SHEAR STRESS OF 95 PA (2.0 LBS/FT2). NON-ORGANIC, PHOTODEGRADABLE, OR BIODEGRADABLE NETTING ALLOWED.
   3. TYPE C: FOR USE ON SLOPES 2:1 OR FLATTER, OR IN CHANNELS WITH A MINIMUM PRODUCT PERMISSIBLE SHEAR STRESS OF 95 PA (2.0 LBS/FT2). ONLY 100% ORGANIC FIBERS ALLOWED. WOVEN MATS ARE ALLOWED WITH A MAXIMUM OPENING OF ½ INCH. USE IN ENVIRONMENTALLY SENSITIVE AREAS THAT HAVE A HIGH PROBABILITY OF ENTRAPPING ANIMALS IN THE PLASTIC NETTING.

D. STAPLES: U-SHAPED NO. 11 GAUGE OR GREATER WIRE WITH A SPAN WIDTH OF ONE TO TWO INCHES AND A LENGTH OF NOT LESS THAN 6 INCHES FOR FIRM SOIL AND 12 INCHES FOR LOOSE SOIL.

2.06 SOIL STABILIZER

A. SOIL STABILIZER SHALL BE A POLYACRYLAMIDE (PAM) AND CALCIUM SOLUTION INTENDED TO REDUCE THE ERODIBILITY OF BARE SOILS. THE PRODUCT SHALL ACHIEVE AN 80% REDUCTION IN SOIL LOSS INDUCED BY A TWO INCH PER HOUR RAINFALL SIMULATOR.

B. PAM MIXTURES SHALL BE ENVIRONMENTALLY BENIGN, HARMLESS TO FISH, AQUATIC ORGANISMS, WILDLIFE, AND PLANTS. ONLY ANIONIC PAM WILL BE PERMITTED.

C. ANIONIC PAM, IN PURE FORM SHALL HAVE NO MORE THAN 0.05% FREE ACRYLIC MONOMER BY WEIGHT, AS ESTABLISHED BY THE FOOD AND DRUG ADMINISTRATION AND THE ENVIRONMENTAL PROTECTION AGENCY. THE ANIONIC PAM IN PURE FORM SHALL NOT EXCEED 200 POUNDS PER BATCH.

D. THE PRODUCT PROVIDED SHALL BE LISTED IN THE WISDOT PAL FOR TYPE B SOIL STABILIZER.

2.07 INLET PROTECTION

A. TYPE A: USE AROUND FIELD INLETS UNTIL PERMANENT STABILIZATION METHODS HAVE BEEN ESTABLISHED. USE ON PAVEMENT INLETS PRIOR TO INSTALLATION OF CURB AND GUTTER OR PAVEMENT.

B. TYPE B: USE ON INLETS WITHOUT CURB HEAD AFTER CASTING AND GRATE ARE IN PLACE.

C. TYPE C: USE ON STREET INLETS WITH CURB HEAD.

D. TYPE D: USE IN AREAS WHERE OTHER TYPED OF INLET PROTECTION ARE INCOMPATIBLE WITH ROADWAY AND TRAFFIC CONDITIONS CAUSING POSSIBLE SAFETY HAZARDS WHEN PONDING OCCURS AT INLET.

E. GEOTEXTILE: TYPE FF MEETING THE REQUIREMENTS OF THE LATEST EDITION OF WISDOT PAL.

PART 3 - EXECUTION

3.01 INSTALLATION OF DIVERSIONS

A. TEMPORARY DIVERSIONS SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH WDNR CONSERVATION PRACTICE STANDARD, CONSTRUCTION SITE DIVERSION (1066).

3.02 INSTALLATION OF SILT FENCE AND STRAW BALE BARRIERS

A. INSTALL STRAW BALE BARRIERS IN ACCORDANCE WITH THE DRAWINGS AND WDNR CONSERVATION PRACTICE STANDARD, SEDIMENT BALE BARRIER (1055).

B. INSTALL SILT FENCE IN ACCORDANCE WITH THE DRAWINGS AND WDNR CONSERVATION PRACTICE STANDARD, SILT FENCE (1056).

C. SILT FENCE AND STRAW BALE BARRIERS SHALL BE PLACED ON THE CONTOUR TO THE EXTENT PRACTICABLE. PLACE FENCES PARALLEL TO THE SLOPE WITH THE ENDS OF THE FENCE TURNED UPSLOPE A DISTANCE OF ONE TO TWO FEET. THE PARALLEL SPACING SHALL NOT EXCEED THE MAXIMUM SLOPE LENGTHS AS INDICATED IN THE FOLLOWING TABLE:

FENCE AND BARRIER SPACING	
SLOPE	SPACING
<2%	100'
2 - 5%	75'
5 - 10%	50'
10 - 33%	25'
>33%	20'

3.03 TEMPORARY SEEDING

A. PROVIDE A SEEDBED OF LOOSE SOIL TO A MINIMUM DEPTH OF 2 INCHES.

B. APPLY SEED EVENLY AT THE RATE SHOWN IN THE FOLLOWING TABLE. RAKE OR DRAG TO COVER THE SEED TO A DEPTH OF 1/4 INCH.

SPECIES	LBS./ACRE
OATS	131
CEREAL RYE	131
WINTER WHEAT	131
ANNUAL RYEGRASS	80

3.04 EROSION MAT INSTALLATION

A. REMOVE STONES, CLODS, STICKS, OR OTHER FOREIGN MATERIAL THAT WOULD DAMAGE THE MAT OR INTERFERE WITH THE MAT BEARING COMPLETELY ON THE SURFACE.

B. INSTALL EROSION MAT IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

C. AFTER SEEDING HAS BEEN COMPLETED, ROLL BLANKETS OUT PARALLEL TO THE DIRECTION OF WATER FLOW, WITH THE NETTING ON TOP. SPREAD THE BLANKETS WITHOUT STRETCHING, MAKING SURE THE FIBERS ARE IN CONTACT WITH THE SOIL. OVERLAP ADJACENT STRIPS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. OVERLAP STRIP ENDS A MINIMUM OF 10 INCHES WITH THE UPGRADE STRIP ON TOP. BURY THE UPGRADE END OF EACH STRIP IN A VERTICAL TRENCH AT LEAST 6 INCHES DEEP.

D. STAPLE THE MAT STRIPS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. STAPLE LONGITUDINAL OVERLAPS AND OUTER EDGES AT MAXIMUM INTERVALS OF 3 FEET. STAPLE STRIP ENDS AT MAXIMUM INTERVALS OF 16 INCHES. PLACE STAPLES THROUGHOUT THE MAT AT MAXIMUM 3-FOOT INTERVALS. INSERT STAPLES FLUSH WITH THE GROUND SURFACE.

3.05 SOIL STABILIZER

A. THE MANUFACTURER SHALL PROVIDE DETAILED WRITTEN INSTRUCTIONS ON THE STORAGE, MIXING, AND APPLICATION PROCEDURES.

B. THE SOIL STABILIZER MAY BE APPLIED BY SPRAYING OR BY DRY SPREADING.

C. APPLICATION RATES: APPLY AT THE RATE RECOMMENDED BY THE MANUFACTURER.

D. DO NOT APPLY WITHIN 30 FEET OF BODY OF WATER (I.E. LAKE, RIVER, STORMWATER POND).

3.06 DITCH EROSION CONTROL

A. THE FOLLOWING EROSION CONTROL MEASURES ARE MINIMUM REQUIREMENTS FOR ALL DITCHES. THE DRAWINGS MAY INCLUDE MORE SPECIFIC MEASURES.

DITCH EROSION CONTROL		
SLOPE RANGE	METHOD	BALE CHECKS
0 - 1%	SEED AND MULCH	NONE
1% - 4%	SEED AND MULCH WITH EROSION MAT	1% - 2%; EVERY 200' 2% - 4%; EVERY100'
4% - 6%	STAKED SOD	EVERY 75'
>6%	STAKED SOD AND/OR RIPRAP AS SPECIFIED BY ENGINEER ON DRAWINGS	EVERY 75' FOR SOD

B. STONE DITCH CHECKS: UNLESS OTHERWISE INDICATED ON THE DRAWINGS, INSTALL STONE DITCH CHECKS AT INTERVALS OF ONE DITCH CHECK FOR EVERY TWO FEET OF DROP IN CHANNEL GRADE.

3.07 INSTALLATION OF SOD IN DITCHES

A. LAY SOD SO THAT JOINTS OF ABUTTING ENDS OF STRIPS ARE NOT CONTINUOUS. LAY EACH STRIP SNUGLY AGAINST PREVIOUSLY LAID STRIPS.

B. ROLL OR FIRMLY TAMP SOD TO PRESS THE SOD INTO THE UNDERLYING SOIL.

C. TURN THE UPPER EDGES OF THE STRIPS INTO THE SOIL.

D. STAKE STRIPS ALONG THE LONGITUDINAL AXIS AT 18-INCH INTERVALS AND NEAR THE TOP EDGE OF THE STRIP. PROVIDE WOOD LATH OR SIMILAR STAKES, 12 INCHES LONG. LEAVE TOP OF STAKE APPROXIMATELY 1/2 INCH ABOVE SOD SURFACE.

3.08 INSTALLATION OF OTHER FACILITIES

A. INLET PROTECTION BARRIERS, CHANNEL STABILIZATION, GRASSED WATERWAYS, ROCK LINED WATERWAYS, SEDIMENTS TRAPS, SEDIMENT BASINS, AND OTHER FORMS OF EROSION CONTROL MEASURES SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH WDNR *TECHNICAL STANDARDS*.

3.09 MAINTENANCE

A. INSPECT DIVERSIONS WITHIN 24 HOURS AFTER EACH RAINFALL OR DAILY DURING PERIODS OF PROLONGED RAINFALL, UNTIL THE VEGETATIVE COVER IS STABILIZED. MAKE NECESSARY REPAIRS IMMEDIATELY.

B. INSPECT FILTER FABRIC FENCES AND BARRIERS WITHIN 24 HOURS AFTER EACH RAINFALL OR DAILY DURING PERIODS OF PROLONGED RAINFALL. NECESSARY REPAIRS OR REPLACEMENT SHALL BE MADE IMMEDIATELY. REMOVE SEDIMENT DEPOSITS WHEN DEPOSITS REACH ONE-HALF THE HEIGHT OF THE FENCE. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR REPLACING FABRIC DUE TO WEATHERING.

C. INSPECT STRAW BALE FENCES AND BARRIERS WITHIN 24 HOURS AFTER EACH RAINFALL OR DAILY DURING PERIODS OF PROLONGED RAINFALL. NECESSARY REPAIRS OR REPLACEMENT SHALL BE MADE IMMEDIATELY. REMOVE SEDIMENT DEPOSITS WHEN DEPOSITS REACH ONE-THIRD THE HEIGHT OF THE BALES. REPLACE BALES AFTER THREE MONTHS.

D. INSPECT ALL SEEDING, SOD, MULCHES, MATS AND NETS WITHIN 24 HOURS AFTER EACH RAINFALL OR DAILY DURING PERIODS OF PROLONGED RAINFALL. ADDITIONAL MULCH, NETTING OR MATTING SHALL BE APPLIED IMMEDIATELY WHEN NECESSARY TO MAINTAIN SUITABLE COVERAGE. MAKE INSPECTIONS UNTIL VEGETATIVE COVER IS ESTABLISHED. WATER SEEDING AND SOD WHEN NECESSARY TO PROMOTE ESTABLISHMENT.

E. ALL OTHER SOIL EROSION CONTROL MEASURES SHOULD BE INSPECTED AND REPAIRED IMMEDIATELY, IF REQUIRED, WITHIN 24 HOURS AFTER STORM EVENT OR DAILY DURING PERIODS OF PROLONGED RAINFALL.

3.10 REMOVAL

A. AFTER FINAL VEGETATION IS ESTABLISHED, REMOVE BALES, SILT FENCES, *DITCH CHECKS, DIVERSIONS,* AND OTHER EROSION CONTROL FACILITIES. RESTORE AREAS DISTURBED BY THE REMOVALS.

3.11 MONITORING FOR WPDES PERMIT

A. UNLESS INDICATED OTHERWISE WITHIN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MONITORING REQUIREMENTS OF THE WPDES PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES.

B. EROSION AND SEDIMENT CONTROLS SHALL BE ROUTINELY INSPECTED AT LEAST EVERY SEVEN DAYS, AND WITHIN 24 HOURS AFTER A PRECIPITATION EVENT OF 0.5 INCHES OR GREATER. WEEKLY WRITTEN REPORTS OF ALL INSPECTIONS SHALL BE MAINTAINED AND SUBMITTED TO THE ENGINEER. THE REPORTS SHALL CONTAIN THE FOLLOWING INFORMATION:
   1. DATE, TIME, AND EXACT PLACE OF INSPECTION.
   2. NAME(S) OF INDIVIDUAL(S) PERFORMING INSPECTION.
   3. AN ASSESSMENT OF THE CONDITION OF EROSION AND SEDIMENT CONTROLS.
   4. A DESCRIPTION OF ANY EROSION AND SEDIMENT CONTROL IMPLEMENTATION AND MAINTENANCE PERFORMED.
   5. A DESCRIPTION OF THE SITES PRESENT PHASE OF CONSTRUCTION.

C. THE ENGINEER WILL PROVIDE THE CONTRACTOR WITH THE APPROPRIATE DNR FORM TO USE FOR THE INSPECTIONS.

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EROSION CONTROL SPECIFICATIONS
McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARDS
TOWN OF SUN PRAIRIE
DANE COUNTY, WI

NO.	REVISIONS	BY	DATE

AS NOTED
SCALE

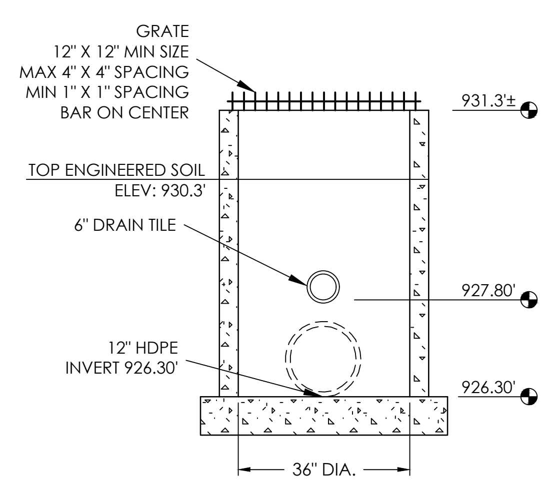
DRAWN BY	SRR
REVIEWED BY	LAL
ISSUE DATE	OCT. 2021
GEC FILE NO.	2-0321-169
SHEET NO.	C6.3

BIDDING DOCUMENTS

NOTES:

1. RUNOFF SHALL NOT BE ALLOWED IN THE BASIN UNTIL AFTER THE TRIBUTARY AREA IS STABILIZED.
2. CONSTRUCTION OF THE BASIN SHOULD ONLY OCCUR DURING SUITABLE SITE CONDITIONS - IF CONSTRUCTION OF THE BASIN OCCURS DURING SATURATED SOIL CONDITIONS, THE SOIL IN THE DEVICE COULD BE UNNECESSARILY COMPACTED.
3. EXCESS SEDIMENT IN THE BIORETENTION BASIN SHALL BE REMOVED AT THE END OF CONSTRUCTION.
4. COMPACTION OF THE SOILS USED FOR THE BIORETENTION DEVICE MUST BE AVOIDED - HEAVY EQUIPMENT SHOULD NOT BE USED IN THE CONSTRUCTION OF THE BASIN AND ONLY TRACKED EQUIPMENT SHALL BE PERMITTED IN THE BASIN.
5. THE ENGINEERED SOIL SHALL BE PREMIXED PRIOR TO PLACEMENT AND DRY ENOUGH TO PREVENT CLUMPING AND COMPACTION.
6. THE BASIN SHALL BE MULCHED WITH 2" THICK DOUBLE SHREDDED MULCH BEFORE THE PLANTING OF THE VEGETATION IN ORDER TO PREVENT COMPACTION.
7. THE MATERIALS USED FOR THE ENGINEERED SOIL SHALL COMPLY WITH WISCONSIN DNR TECHNICAL STANDARD 1004.
8. LIVE PLANT PLUGS GROWN TO AT LEAST 1.25" x 1.25" x 2.25" IN POTS SHALL BE PLANTED AT 1' ON CENTER THROUGHOUT THE PLANTING AREA. PLANTING SHALL BE CONDUCTED WHEN CONSTRUCTION ACTIVITIES HAVE CEASED.
9. PLANTS SHALL BE NATIVE PLANTS AS SPECIFIED BY AGRECOL OR OTHER APPROVED NURSERY.
10. CLASS II RIPRAP WITH GEOTEXTILE FABRIC SHALL BE PROVIDED AT ALL INLETS WITH CONCENTRATED FLOWS TO PREVENT EROSION OF THE MULCH AND ENGINEERED SOIL NEAR INLETS.
11. BIORETENTION BASIN SHALL BE DEEP TILLED AT THE END OF CONSTRUCTION PRIOR TO MULCHING AND PLANTING.
12. BIORETENTION BASIN SHALL BE WATERED TWICE A WEEK (IF NO RAIN) UNTIL PLANTS ARE ESTABLISHED.

NOTES



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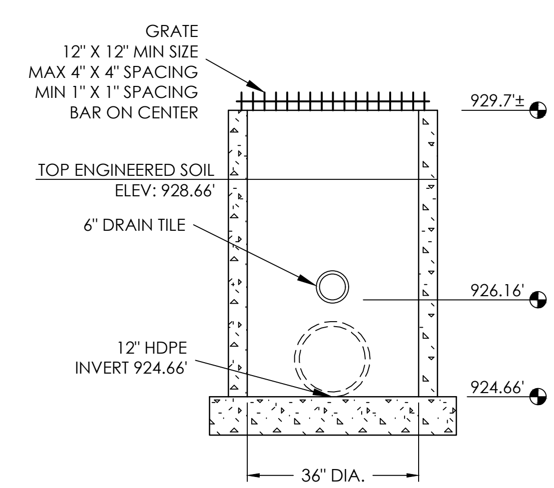

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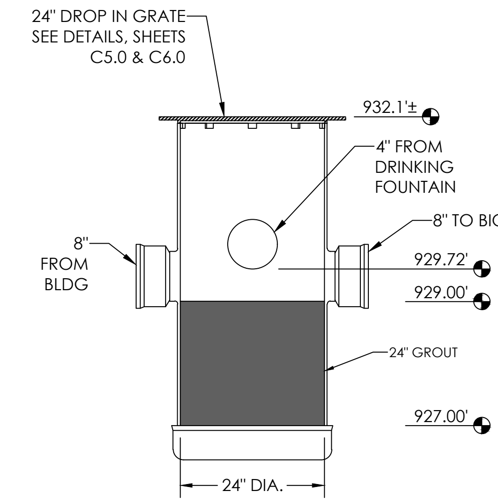

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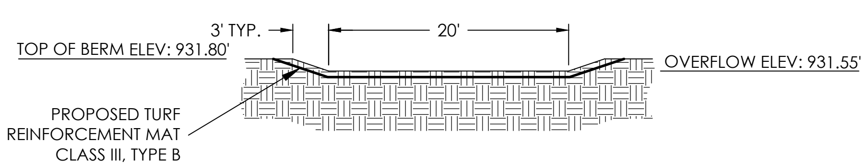
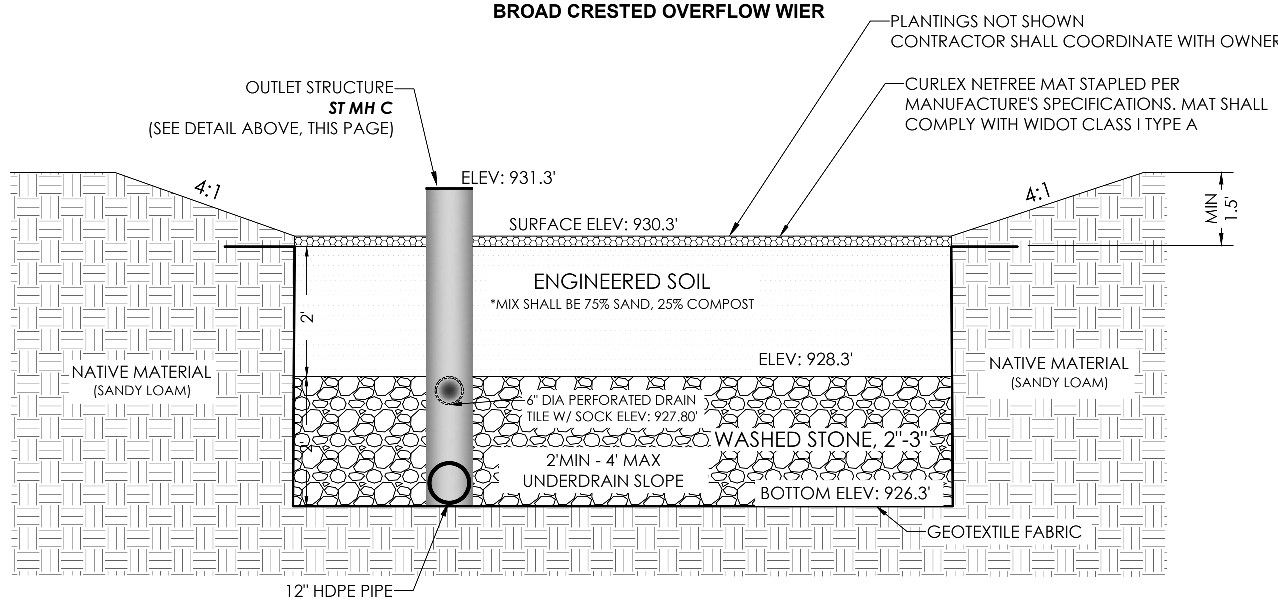
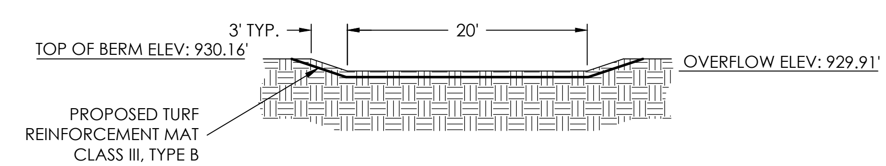
MANHOLES AND OUTLET STRUCTURES



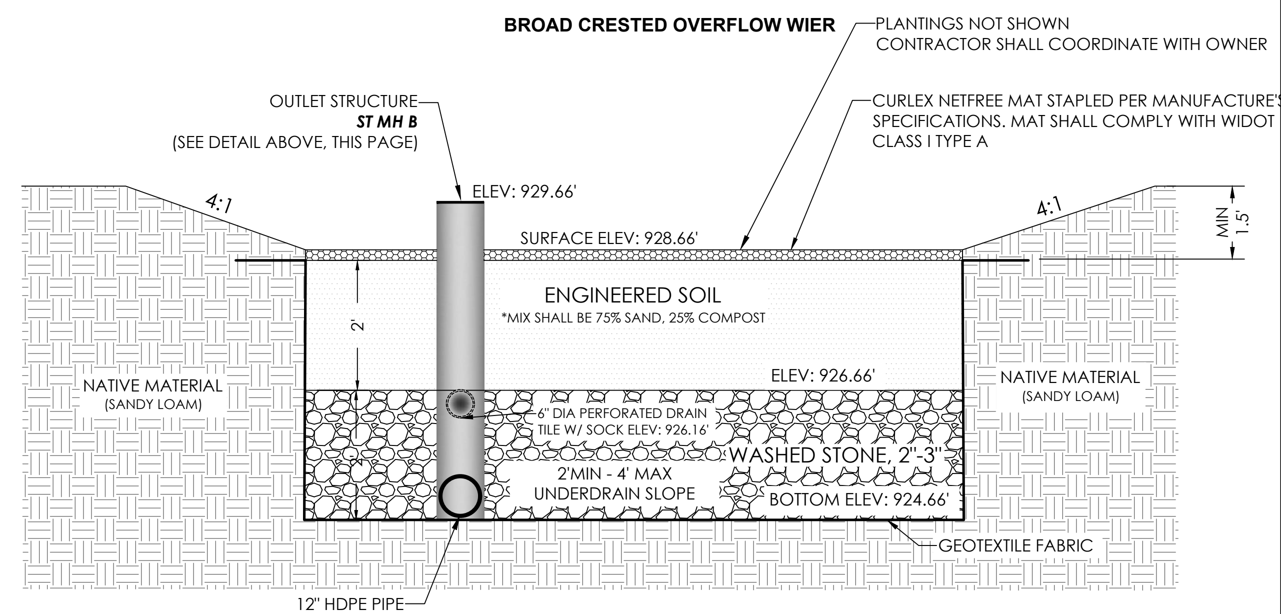
BROAD CRESTED OVERFLOW WIER



BIO-2 DEVICE



BROAD CRESTED OVERFLOW WIER



BIO-1 DEVICE

X-SECTIONS

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BIOFILTRATION DEVICES DETAIL

MCCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

NO.	BY	DATE	REVISIONS

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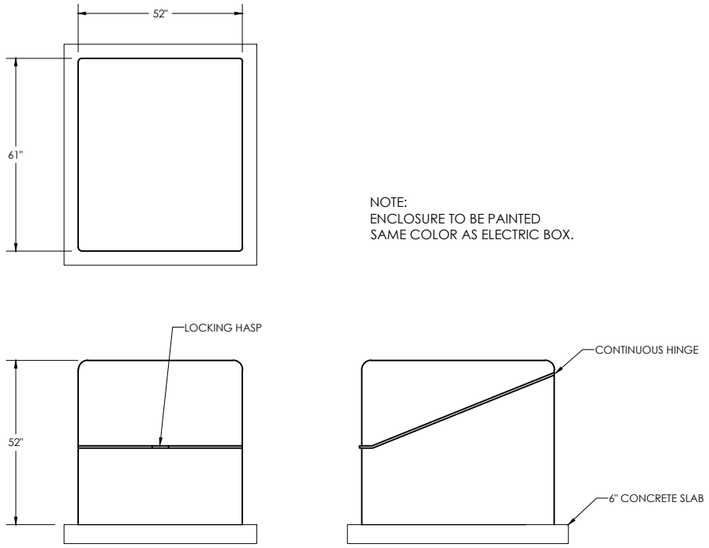
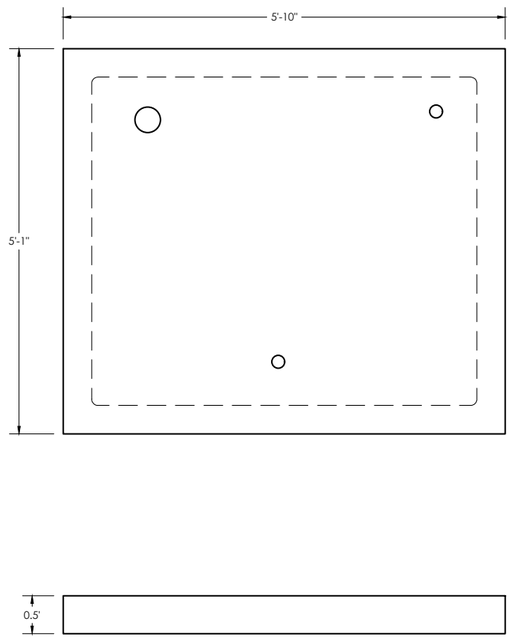


TYPICAL WELL DOG-HOUSE ENCLOSURE

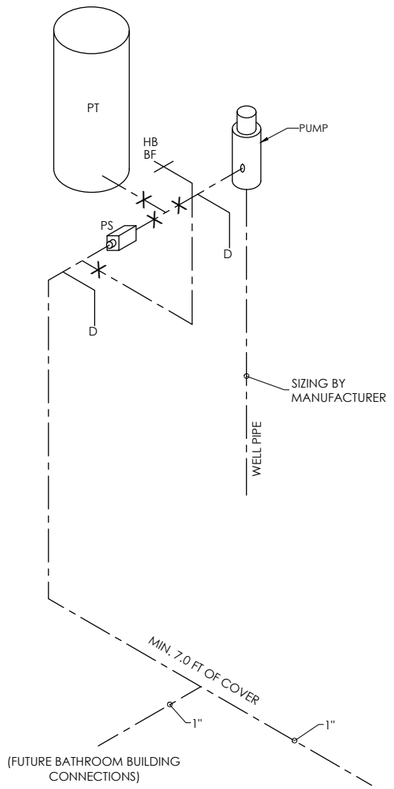


NOTES:

1. HOLES TO BE PROVIDED FOR EQUIPMENT CONDUIT, AND PIPING.

2. SEE GENERAL NOTE THIS PAGE.

TYPICAL CONCRETE SLAB



NOTES:

1. UNDERGROUND PIPING FROM WELL DOGHOUSE SHALL BE POLYETHELYNE.
2. DISTRIBUTION PIPING WITHIN DOGHOUSE SHALL BE COPPER.
3. WATER DISTRIBUTION SYSTEM SHALL INCLUDE DRAINS AND WINTERIZATION PORTS.

—·—	= WATER
✕	= VALVE
PT	= PRESSURE TANK (Ø22"x47" TALL)
HB	= HOSE BIB
BF	= BACKFLOW PREVENTER
PS	= PRESSURE SWITCH
D	= DRAIN

WATER DISTRIBUTION RISER DIAGRAM

GENERAL CONTRACTOR TO COORDINATE WITH MEP CONTRACTOR(S) ON:
- -PUMP SIZING
- -TANK SIZING
- -EXACT SIZING OF ENCLOSURE
- -LAYOUT OF CONDUIT AND PIPING

NOTES

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WELLHOUSE DETAILS
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BIDDING DOCUMENTS

PIER SCHEDULE

MARK	DIMENSIONS			REINFORCEMENT	TOP OF ELEV	REMARKS
	WIDTH	LENGTH	DEPTH			
P1	16" 24"	16" 24"	26" 36"	4 - #5 BARS, VERTICAL w/ #3 TIES @ 12" O.C.	+2'-2"	
P2						

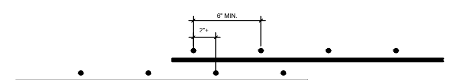
NOTE: PRIOR TO CONSTRUCTION CONTRACTOR TO VERIFY PIER SIZES WITH METAL BUILDING MFG'S BASE PLATE AND ANCHOR BOLT LAYOUTS

FOOTING SCHEDULE

MARK	DIMENSIONS			REINFORCEMENT (W)- SPAN WIDTH (L)- SPAN LENGTH	TOP OF ELEV	REMARKS
	WIDTH	LENGTH	DEPTH			
F1	32"	32"	12"	4 - #5	- 3'-0"	
F2						
F3						
F4						
F5						
F6						
F7						
F8						
F9						
F10						
F11						
F12						

CONCRETE REINFORCEMENT NOTES:

1. REINFORCING SHALL BE DETAILED IN ACCORDANCE WITH ACI 315 MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES (MOST CURRENTLY ADOPTED EDITION).
2. PROVIDE MINIMUM COVER PER ACI 318, 7.7.1 ALSO SEE MILD STEEL PROTECTION NOTES
3. WIRE SPACERS, CHAIRS, TIES, ETC. FOR SUPPORT OF STEEL REINFORCING SHALL BE PROVIDED BY THE CONCRETE CONTRACTOR TO ENSURE REINFORCING IS PLACED AND MAINTAINED IN THE PROPER POSITION DURING CONCRETE PLACEMENT.
4. ALL HOOKS IN STEEL REINFORCING SHALL BE ACI STANDARD HOOKS.
5. TERMINATE NON-CONTINUOUS STEEL REINFORCING WITH AN ACI STANDARD HOOK IF REQUIRED EMBEDMENT SHOWN ON DRAWINGS CANNOT BE OBTAINED.
6. ALL LAPS SHALL BE CLASS "B" PER ACI 318 ON THE DESIGN DRAWINGS, OR UNLESS THE DETAILER TAKES SPECIAL CARE TO PROVIDE STAGGERED LAPS. USE TO BAR LENGTHS FOR ALL HORIZONTAL WALL BARS AND FOR TOP BARS IN SLABS AND BEAMS OVER 12" DEEP.
7. STEEL REINFORCING SPLICES OF ADJACENT BARS SHALL BE STAGGERED SUCH THAT SPLICES ARE 4 FEET APART, MINIMUM.
8. CORNER BARS WITH CLASS "B" LAP PER ACI318 SHALL BE PROVIDED AT ALL WALL CORNERS AND AND INTERSECTIONS.
9. PROVIDE STEEL REINFORCING AROUND OPENINGS IN CONCRETE WALLS AND SLABS.
10. PROVIDE STEEL REINFORCING AT FOOTING STEPS.
11. WELDED WIRE REINFORCING SHALL BE IN FLAT SHEETS ONLY AND SHALL BE LAPPED AND/OR ANCHORED TO DEVELOP Fy PER ACI 315.



12. WELDING OF STEEL REINFORCEMENT IS NOT PERMITTED, UNLESS APPROVED BY ENGINEER.

MILD REINFORCING STEEL PROTECTION NOTES:

THE FOLLOWING MINIMUM DIMENSIONS SHALL BE PROVIDED AS A CLEAR COVER FOR REINFORCING BARS IN STRUCTURAL MEMBERS:

CONCRETE CAST AGAINST EARTH AND PERMANENTLY EXPOSED TO EARTH:

- FOOTINGS — 3"

CONCRETE PERMANENTLY EXPOSED TO EARTH OR WEATHER:

- WALLS, COLUMNS, PIERS:
  - UP THROUGH #5 BARS — 1-1/2"
  - #6 THROUGH #18 BARS — 2"

CONCRETE NOT EXPOSED TO EARTH OR WEATHER:

- WALLS:
  - UP THROUGH #11 BARS — 3/4"
  - #14 AND #18 BARS — 1-1/2"
- COLUMNS / PIERS:
  - SIDES — 1-1/2"

MATERIAL DESIGN PROPERTIES:

CONCRETE PROPERTIES:

USE	28 DAY STRENGTH	MIN. H2O /CEMENT RATIO	SLUMP (INCHES)	MAX. AGGREGATE SZ.
STRUCTURAL SLAB	4,000 PSI	.57	4 ±1	3/4
INTERIOR FLOORS	3,500 PSI	.62	3 ±1	3/4
WALLS	3,500 PSI	.62	3 ±1	3/4
PIERS	3,500 PSI	.62	3 ±1	3/4
FOOTINGS	3,500 PSI	.62	3 ±1	1-1/2
EXTERIOR FLOORS	4,000 PSI	.48	3 ±1	3/4

REINFORCING STEEL STRENGTHS:

BARS (ASTM A615, GRADE 60)	fy = 60,000 PSI
WELDED WIRE MESH (ASTM A 185)	fy = 65,000 PSI

STRUCTURAL STEEL STRENGTHS:

STEEL SUPPLIED BY METAL BUILDING MANUFACTURER	PER MTL BLDG SPECS
OTHER:	
W SHAPES (ASTM A992 Gr 50)	fy = 50,000 PSI
ANGLES, CHANNELS,PLATES, & BARS (ASTM A36)	fy = 36,000 PSI
SQUARE & RECTANGULAR TS OR HSS SECTIONS (ASTM A500 ,GR	fy = 50,000 PSI
HIGH STRENGTH BOLTS (ASTM A325)	

MISCELLANEOUS STRUCTURAL NOTES:

1. ENGINEER ASSUMES PIN BASED COLUMNS.
2. CONNECTORS:
   A. FOR EXTERIOR AND INTERIOR APPLICATIONS WHERE EXPOSED TO MOISTURE, WHERE PRESSURE TREATED WOOD IS USED, AND FOR INTERIOR CORROSIVE ENVIRONMENTS ALL CONNECTORS SHALL BE HOT DIPPED GALVANIZED PER ASTM A 153A / 153M, OR STAINLESS STEEL, INCLUDING EXPANSION BOLTS, ANCHOR BOLTS, JOIST HANGERS, AND NAILS.
   B. CONNECTION DESIGN TO WOOD OR STEEL FRAMING AND EVALUATION OF STRUCTURAL MEMBERS ADEQUACY BY A REGISTERED PROFESSIONAL ENGINEER SHALL BE PROVIDED BY ALL SUBCONTRACTORS.
   C. INSTALLER OF ANCHORS OR CONNECTIONS TO STRUCTURE IS RESPONSIBLE FOR ANCHOR DESIGN AND DETERMINATION OF STRUCTURAL COMPONENT ADEQUACY. DO NOT CUT REINFORCING BARS OR DAMAGE OTHER EMBEDMENTS.
3. WORK BY OTHERS:
   A. ALL SUPPORTS, FRAMING, SUB-FRAMING, LIGHT GAGE FRAMING, MISCELLANEOUS STEEL FRAMING, METAL FABRICATIONS, BRACING BRACKETS, HANGERS, CONNECTORS, EMBEDMENTS, FASTENERS, AND ATTACHMENTS NOT SHOWN ON THE STRUCTURAL DRAWINGS ARE THE CONTRACTOR'S RESPONSIBILITY AND SHALL BE ENGINEERED AND PROVIDED BY THE CONTRACTOR REQUIRING THE ITEM. COMPLY WITH GOVERNING CODES.
   B. CONSTRUCTION MEANS AND METHODS ARE THE CONTRACTOR'S RESPONSIBILITY AND SHALL BE ENGINEERED AND PROVIDED BY THE CONTRACTOR REQUIRING SUCH, SUCH WORK INCLUDES, BUT IS NOT LIMITED TO:
      1. EVALUATION OF STRUCTURE FOR CONSTRUCTION EQUIPMENT LOADS SUCH AS FORKLIFTS, MATERIAL STOCKPILES, ETC.
      2. EVALUATION OF STRUCTURE FOR INSTALLATION OF ANY NECESSARY SHORING FOR MOVING LOADS DURING INSTALLATION OF HEAVY EQUIPMENT.
4. WHERE DIMENSIONS OR WEIGHTS OF EQUIPMENT OR SYSTEMS ARE VARIABLE FROM MANUFACTURER TO MANUFACTURER, VERIFY DIMENSIONS AND WEIGHTS SHOWN ON DRAWINGS WITH SELECTED MANUFACTURER PRIOR TO ORDERING MATERIALS, NOTIFY ENGINEER OF DISCREPANCIES.
5. DO NOT SUSPEND POINT LOADS FROM ROOF SHEATHING OR ROOF PURLINS UNLESS APPROVED BY THE ENGINEER. POINT LOADS INCLUDE, BUT ARE NOT LIMITED TO: HANGERS FOR CEILINGS, PIPES, DUCTS, STEEL STUDS, EQUIPMENT, ETC. CONTRACTOR INSTALLING SUCH POINT LOADS SHALL PROVIDE SUB-FRAMING TO TRANSFER LOAD TO THE STRUCTURE SUPPORTING DECK.

CONCRETE CAST-IN-PLACE NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (MOST CURRENTLY ADOPTED EDITION).
2. CONTRACTOR SHALL NOTIFY ENGINEER AT LEAST 48 HOURS PRIOR TO PLACING CONCRETE TO FACILITATE ON-SITE OBSERVATION OF REBAR.
3. WHEN THE AVERAGE TEMPERATURE FROM MIDNIGHT IS EXPECTED TO DROP BELOW 40 DEGREES FAHRENHEIT FOR THREE SUCCESSIVE DAYS, COLD WEATHER CONCRETING REQUIREMENTS SHALL BE FOLLOWED, REFER TO ACI 306R.
4. WHEN AMBIENT AIR OR CONCRETE TEMPERATURE EXCEEDS 90 DEGREES FAHRENHEIT, STEEL REINFORCING AND/OR FORMING SURFACES ARE ABOVE 120 DEGREES FAHRENHEIT, OR WHEN WIND VELOCITY, HUMIDITY, OR SOLAR RADIATION CREATE CONDITIONS OF ACCELERATED MOISTURE LOSS AND INCREASE RATE OF HYDRATION, HOT WEATHER CONCRETING REQUIREMENTS SHALL BE FOLLOWED. REFER TO ACI 305R.
5. ALL CONCRETE SURFACES SHALL BE FORMED OR APPROVED BY THE ENGINEER.
6. CONCRETE COLUMNS OR PIERS SHOWN INTEGRAL WITH CONCRETE WALLS SHALL BE POURED MONOLITHICALLY WITH ADJACENT CONCRETE WALLS.
7. CONTROL JOINTS SHALL BE CUT IN SLAB-ON-GRADE CONSTRUCTION WITHIN 24 HOURS OF INITIAL POUR.
8. PROVIDE WALL CONSTRUCTION JOINTS AS SHOWN IN DETAILS. ALLOW AT LEAST 24 HOURS BETWEEN POURING ADJACENT WALL SECTIONS AT CONSTRUCTION JOINTS.
9. PROVIDE ISOLATION JOINTS WHERE SLABS ABUT VERTICAL SURFACES AS SHOWN.
10. SLEEVES, CONDUITS, OR PIPES THROUGH SLABS AND WALLS SHALL BE PLACED AT THREE DIAMETERS O/C, OR 4" MINIMUM.
11. ALUMINUM CONDUIT OR PIPING SHALL NOT BE CAST IN CONCRETE.

STRUCTURAL DESIGN DATA:

DESIGN CODE:

2011 WISCONSIN ENROLLED COMMERCIAL BUILDING CODE

SOIL LOAD:

ALLOWABLE NET SOIL BEARING PRESSURE (ASSUMED)	2,000 PSF
SOILS REPORT AVAILABLE	NO

***SEISMIC LOAD:**

SEISMIC USE GROUP / OCCUPANCY CATEGORY	II
SEISMIC LOAD IMPORTANCE FACTOR (Ie)	1.0
SEISMIC SITE CLASS	D (ASSUMED)
MAPPED SPECTRAL RESPONSE ACCELERATION (Ss)	0.111
MAPPED SPECTRAL RESPONSE ACCELERATION (S1)	0.045
SPECTRAL RESPONSE COEFFICIENT (Sds)	0.119
SPECTRAL RESPONSE COEFFICIENT (Sd1)	0.72
SEISMIC DESIGN CATEGORY	A

***WIND LOAD:**

BASIC WIND SPEED	90 MPH
BUILDING OCCUPANCYCATEGORY	II
WIND LOAD IMPORTANCE FACTOR (Iw)	1.0
WIND EXPOSURE	B
INTERNAL PRESSURE COEFFICIENTS	± 0.18

ROOF DESIGN LOAD:

ROOF LIVE LOAD	23.1 PSF
ROOF DEAD LOAD	15 PSF
UNBALANCED LOAD:	
WINDWARD	0 PSF
LEEWARD	40 PSF
DRIFT LOADS	(SEE DIAGRAM S303)

***SNOW LOAD:**

GROUND SNOW LOAD	30 PSF
SNOW EXPOSURE FACTOR (Ce)	1.0
SNOW IMPORTANCE FACTOR	1.0
THERMAL FACTOR	1.1
OCCUPANCY CATEGORY	II

*** SEISMIC, WIND, AND SNOW LOAD CALCULATIONS AND DESIGN DATA SHALL BE PERFORMED AND SUPPLIED BY THE TRUSS MANUFACTURER.**

FOUNDATION PLAN NOTES:

1. CONTRACTOR SHALL PROVIDE FROST PROTECTION AND MOISTURE PROTECTION FOR FOOTINGS EXPOSED DURING CONSTRUCTION.
2. REFER TO ARCHITECTURAL DRAWINGS OR PLUMBING DRAWINGS FOR SPECIFIC FLOOR DRAIN LOCATIONS AND ELEVATIONS.
3. REFER TO STRUCTURAL DETAIL PLAN SHEETS FOR MISCELLANEOUS DETAILS NOT INDICATED ON PLAN.
4. NOTIFY ENGINEER OF ANY UNUSUAL SOIL CONDITIONS. ALL FOOTINGS SHALL REST ON UNDISTURBED ROCK OR SOIL EXCAVATIONS FOR FOOTINGS SHALL BE APPROVED BY ENGINEER PRIOR TO PLACEMENT OF CONCRETE.
5. WHERE REQUIRED, REMOVE UNSUITABLE EXISTING SOILS BELOW FOOTINGS, SLABS-ON-GRADE, ETC. TO APPROVED BEARING SOIL. REPLACE WITH ENGINEERED FILL (COMPACTED TO 95% OF THE MODIFIED PROCTOR DENSITY) TO THE REQUIRED FOOTING BEARING ELEVATION. REVIEW SOIL REPORT, IF ANY, FILL MATERIAL SHALL HAVE A MINIMUM BEARING CAPACITY AS INDICATED IN THE STRUCTURAL DESIGN DATA SOIL LOAD INFORMATION ON SHEET S0.0. TYPE OF FILL MATERIAL AND PLACEMENT SHALL CONFORM TO SPECIFICATIONS UNDER THE DIRECTION AND SUPERVISION OF THE SOILS ENGINEER. SOILS ENGINEER SHALL FIELD VERIFY ALL BEARING CAPACITIES BEFORE FOOTINGS ARE POURED. CONTACT ENGINEER IF UNABLE TO ATTAIN LISTED SOIL BEARING PRESSURE.
6. PROVIDE A MINIMUM OF 8 INCHES OF WELL COMPACTED GRANULAR FILL BELOW ALL SLABS ON GRADE. COMPACT TO 95% OF THE MODIFIED PROCTOR DENSITY.
7. CONCRETE EXPOSED TO WEATHER (RETAINING WALLS, EXTERIOR SLABS, WALKS, CURBS, ETC. BUT EXCLUDING EXPOSED FOUNDATION WALLS) SHALL CONTAIN 4 TO 7 PERCENT AIR BY VOLUME.
8. DELIVERY TICKETS FOR EACH LOAD OF CONCRETE DELIVERED TO THE JOB SITE SHALL BE FURNISHED UPON REQUEST TO THE ENGINEER. TICKET INFORMATION SHALL CONTAIN ALL PERTINENT DESIGN INFORMATION, INCLUDING AMOUNT OF WATER ADDED AT THE JOB SITE, IF ANY.
9. VERIFY PIER CENTERLINE SPACINGS, ANCHOR BOLT LAYOUT, AND FOUNDATION DIMENSIONS WITH METAL BUILDING MANUFACTURER'S ANCHOR BOLT PLAN. VERIFY THAT ALL BASE PLATES WILL BEAR FULLY ON CONCRETE PIERS, NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO POURING CONCRETE.
10. FORMWORK FOR FOOTINGS SHALL CONSIST OF A MANUFACTURED FORM SYSTEM OR A MINIMUM 1-1/2" THICK WOOD PLANK SECURED TO WOOD OR STEEL STAKES. POURING TO EXCAVATION BANK MAY NOT BE DONE WITHOUT PRIOR APPROVAL OF THE ENGINEER.
11. MIXING AND PLACING OF CONCRETE TO BE IN ACCORDANCE WITH ACI 318. CONCRETE SHALL BE DEPOSITED AS NEARLY AS PRACTICAL IN ITS FINAL POSITION TO AVOID SEGREGATION DUE TO REHANDLING OR FLOWING. CONCRETING SHALL BE CARRIED ON A SUCH A RATE THAT CONCRETE IS AT ALL TIMES PLASTIC AND FLOWS READILY INTO SPACES BETWEEN REINFORCEMENT. ALL CONCRETE SHALL BE THOROUGHLY CONSOLIDATED BY SUITABLE MEANS DURING PLACEMENT AND SHALL BE THOROUGHLY WORKED AROUND REINFORCEMENT AND EMBEDDED FIXTURES AND INTO CORNERS OF FORMS.

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STRUCTURAL NOTES
McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

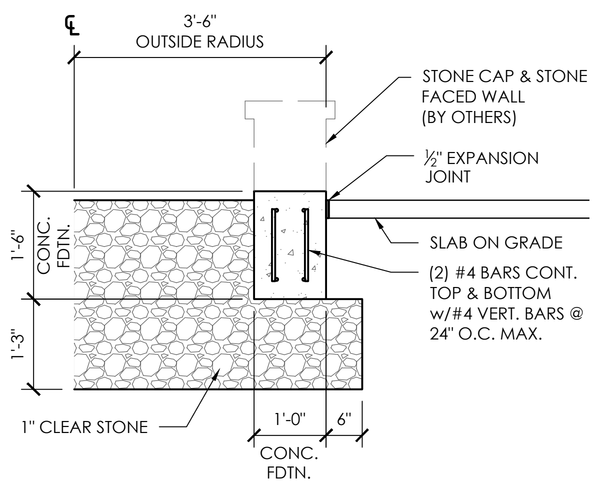
TOWN OF SUN PRAIRIE
DANE COUNTY, WI

REVISIONS	NO.	BY	DATE

0 X
SCALE

DRAWN BY	SRR
REVIEWED BY	LAL
ISSUE DATE	AUG. 2021
GEC FILE NO.	2-0321-169
SHEET NO.	S0.0

BIDDING DOCUMENTS



4 FIRE PIT FOUNDATION SECTION
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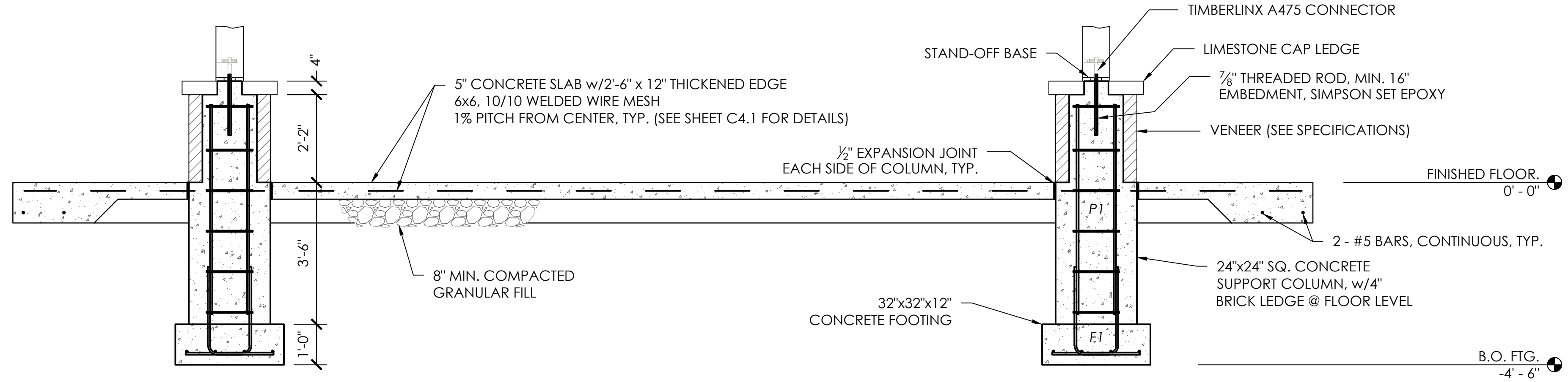

3 SECTION
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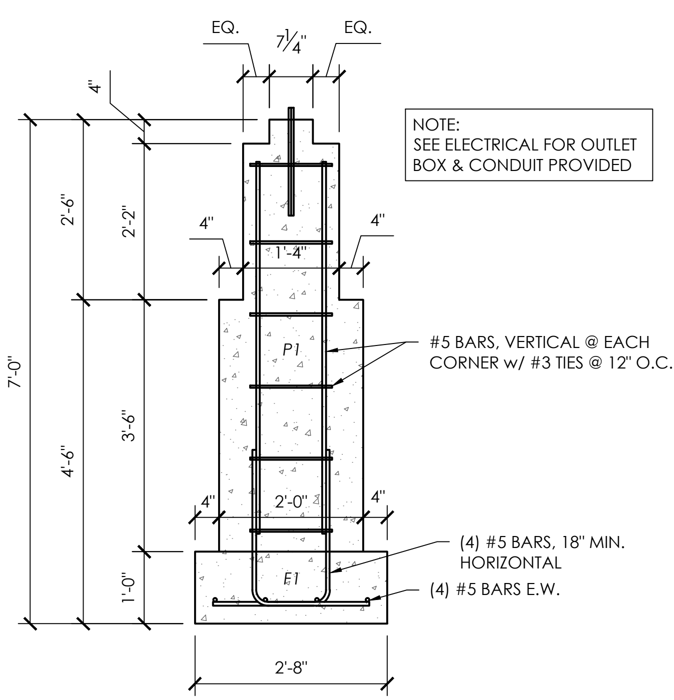
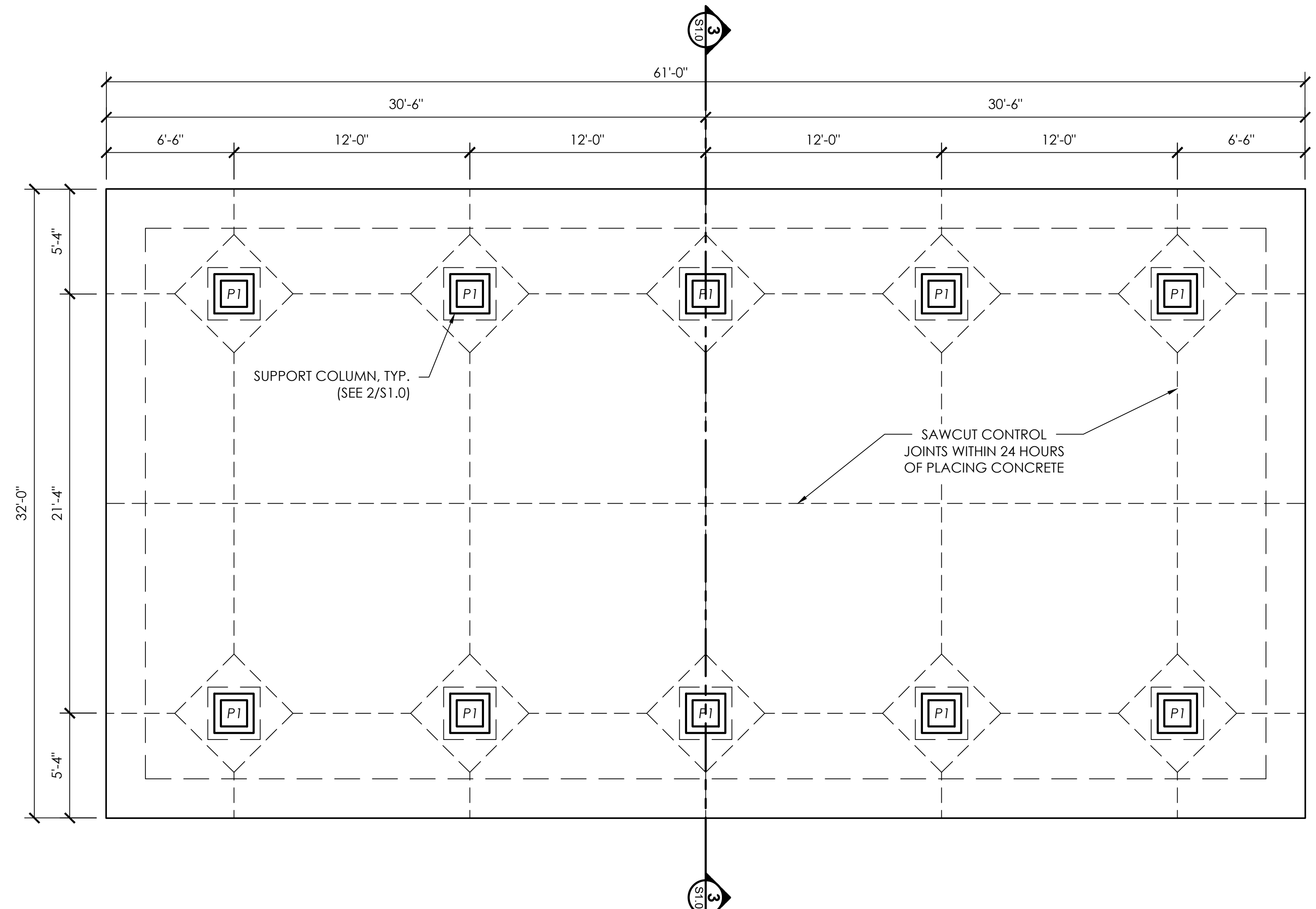


2 TYP. PIER SECTION
SCALE: ⅜" = 1'-0" (11x17)



1 FOUNDATION PLAN
SCALE: ⅛" = 1'-0" (11x17)

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FOUNDATION PLAN & SECTION
McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

REVISIONS	NO.	BY	DATE
UPDATE PIER SECTION	1	SRR	10/14/2021

DRAWN BY	SRR
REVIEWED BY	LAL
ISSUE DATE	OCT. 2021
GEC FILE NO.	2-0321-169
SHEET NO.	S1.0

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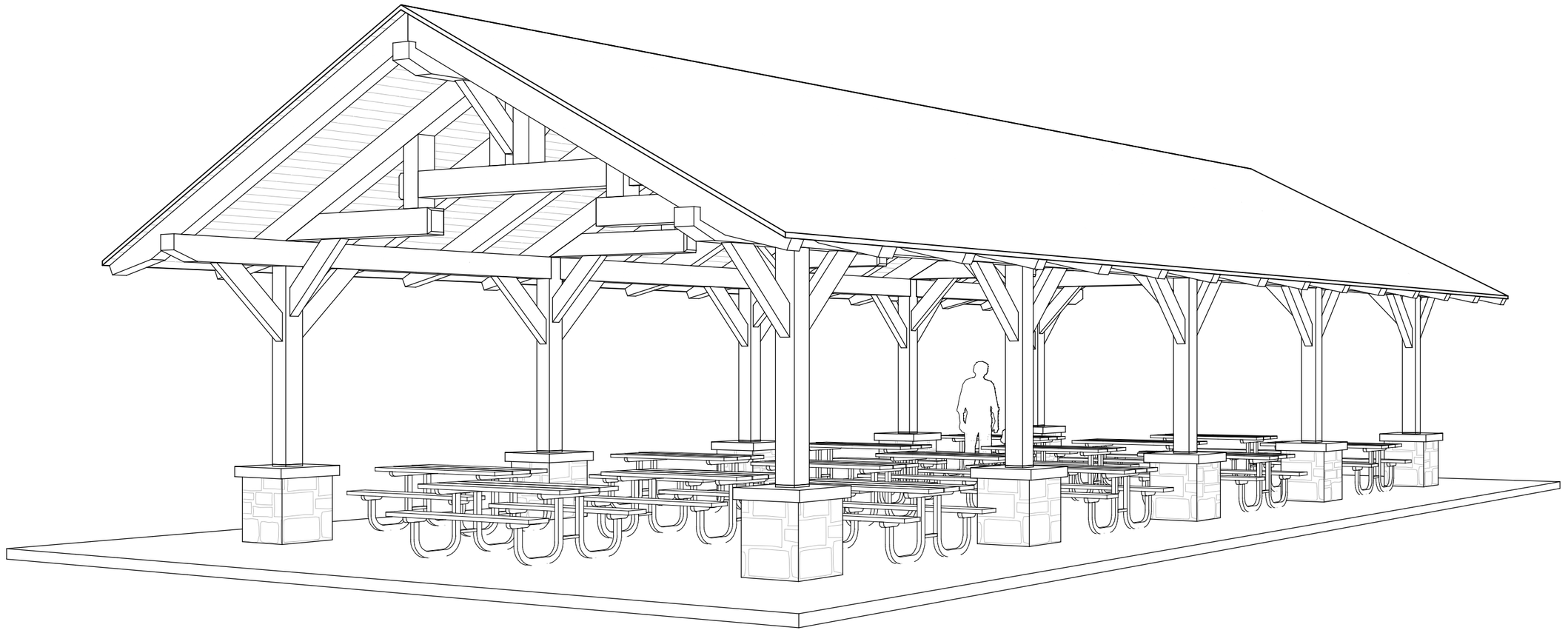

PERSPECTIVE VIEW

SCALE: NONE

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PERSPECTIVE VIEW

McCARTHY PARK IMPROVEMENTS

DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

NO.	BY	DATE
REVISIONS		

0 X
SCALE

DRAWN BY	SRR
REVIEWED BY	LAL
ISSUE DATE	AUG. 2021
GEC FILE NO.	2-0321-169
SHEET NO.	A0.0

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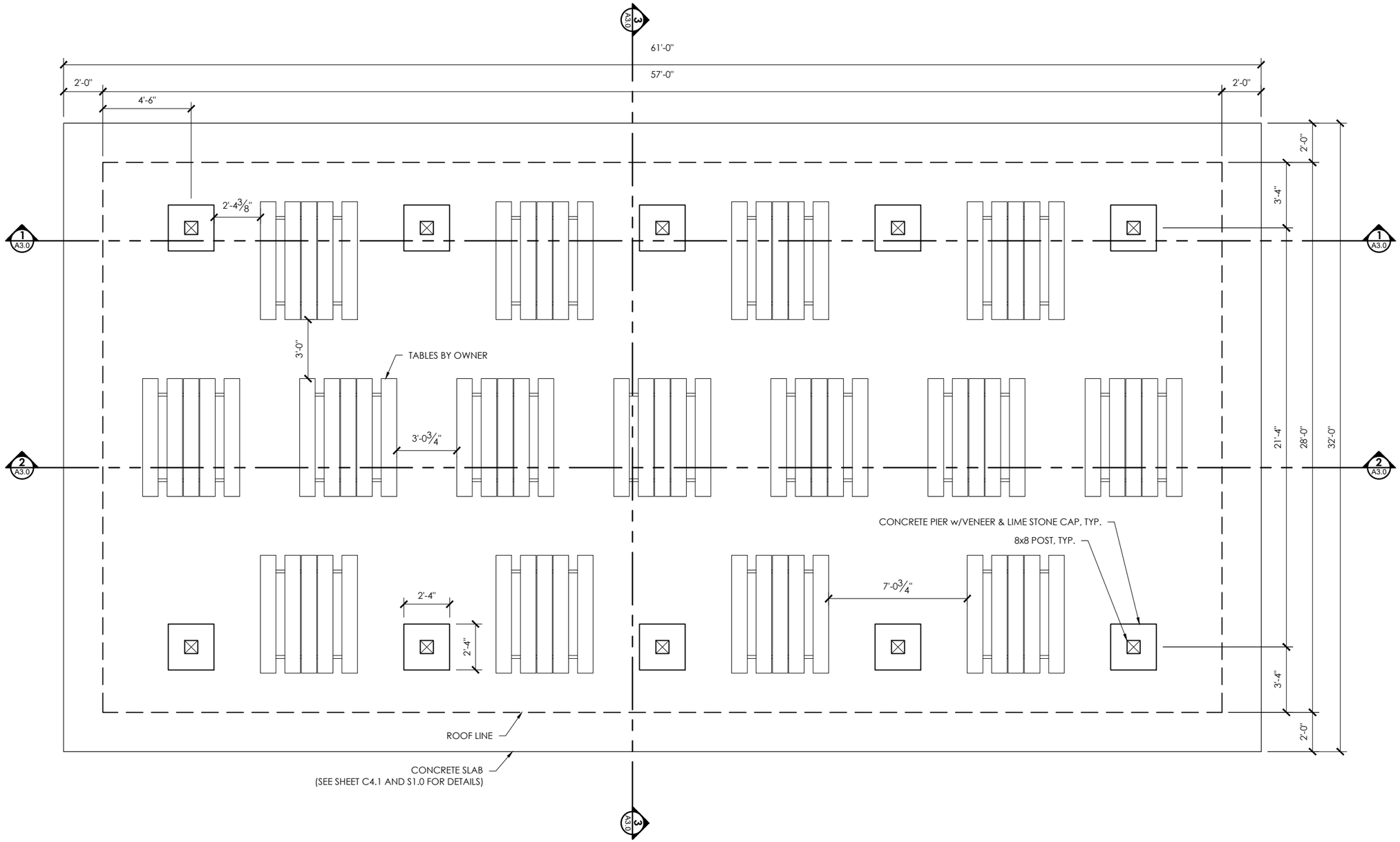

1 FLOOR PLAN
SCALE: 3/16" = 1'-0" (11x17)

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FLOOR PLAN
McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

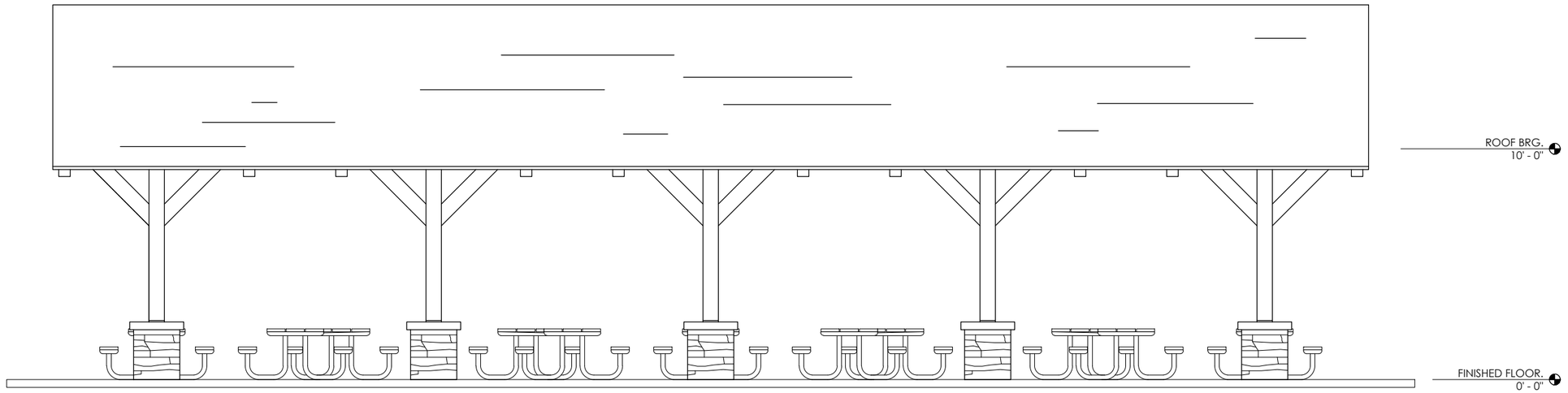
TOWN OF SUN PRAIRIE
DANE COUNTY, WI

NO.	BY	DATE
REVISIONS		

SCALE: 0 X

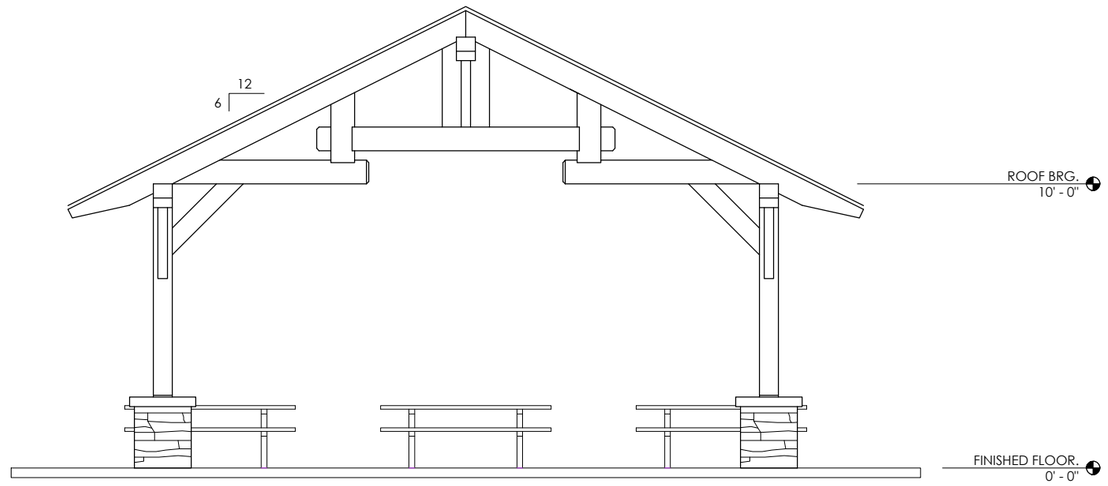
DRAWN BY	SRR
REVIEWED BY	LAL
ISSUE DATE	AUG. 2021
GEC FILE NO.	2-0321-169
SHEET NO.	A1.0

BIDDING DOCUMENTS



2 WEST & EAST ELEVATIONS

SCALE: 3/16" = 1'-0" (11x17)



1 NORTH & SOUTH ELEVATIONS

SCALE: 3/16" = 1'-0" (11x17)

0 3 9
1 6

GLENVILLE TIMBER WRIGHTS

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ELEVATIONS

McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

NO.	REVISIONS	BY	DATE

0 X
SCALE

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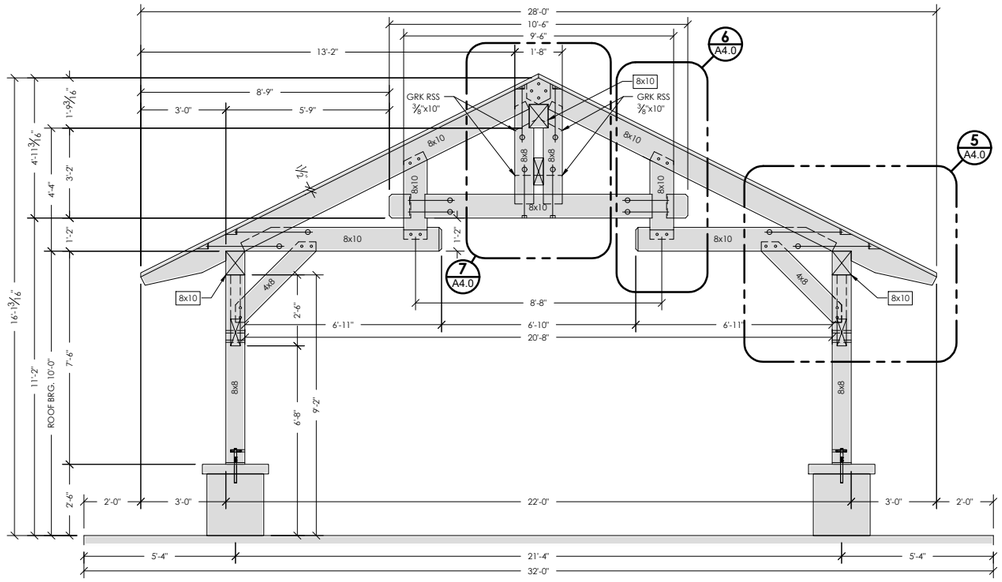
ISSUE DATE	AUG. 2021
GEC FILE NO.	2-0321-169
SHEET NO.	A2.0

BIDDING DOCUMENTS



3 TRUSS SECTION

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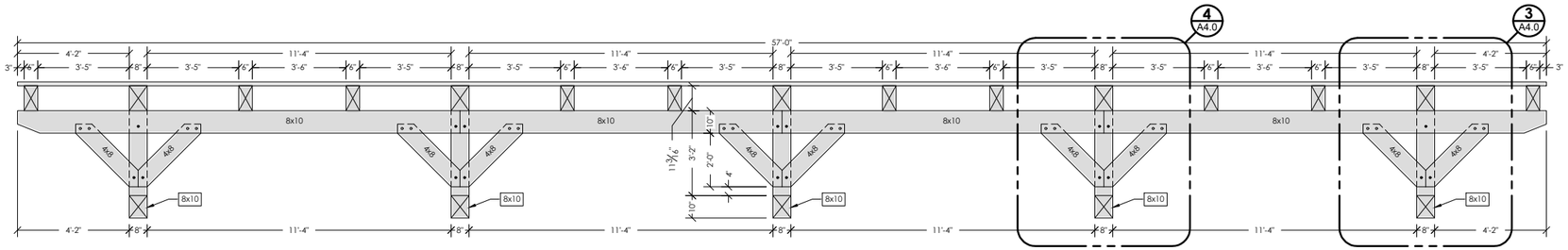

2 PARTIAL SECTION @ RIDGE

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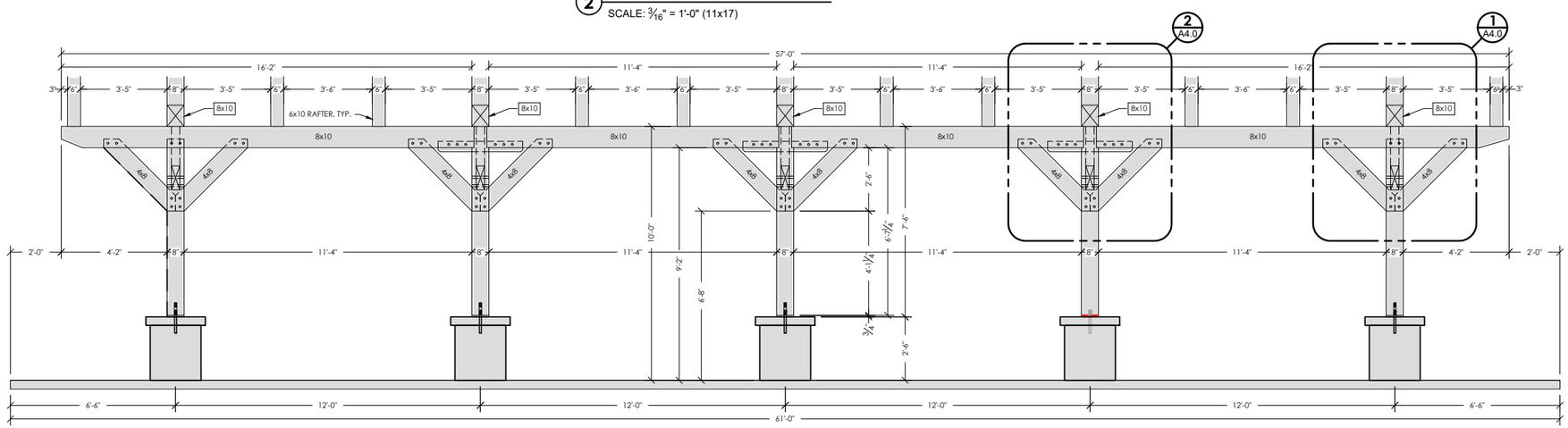

1 SECTION AT COLUMN

SCALE: 3/16" = 1'-0" (11x17)

GLENVILLE TIMBER WRIGHTS

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BUILDING SECTIONS

McCARTHY PARK IMPROVEMENTS

DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

NO.	BY	DATE	REVISIONS

0 — SCALE — X

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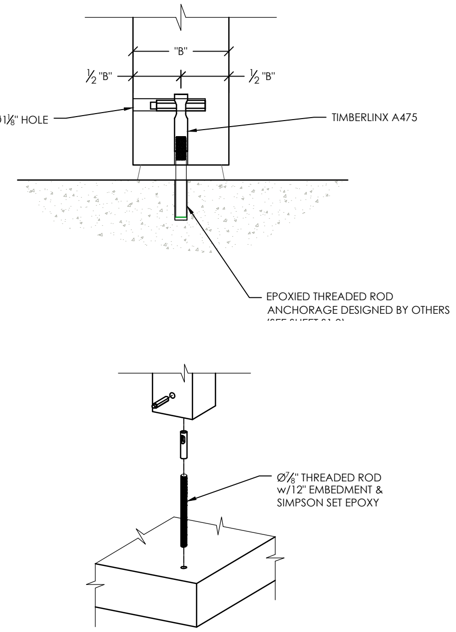
REVIEWED BY	LAL
ISSUE DATE	AUG. 2021
GEC FILE NO.	2-0321-169
SHEET NO.	A3.0

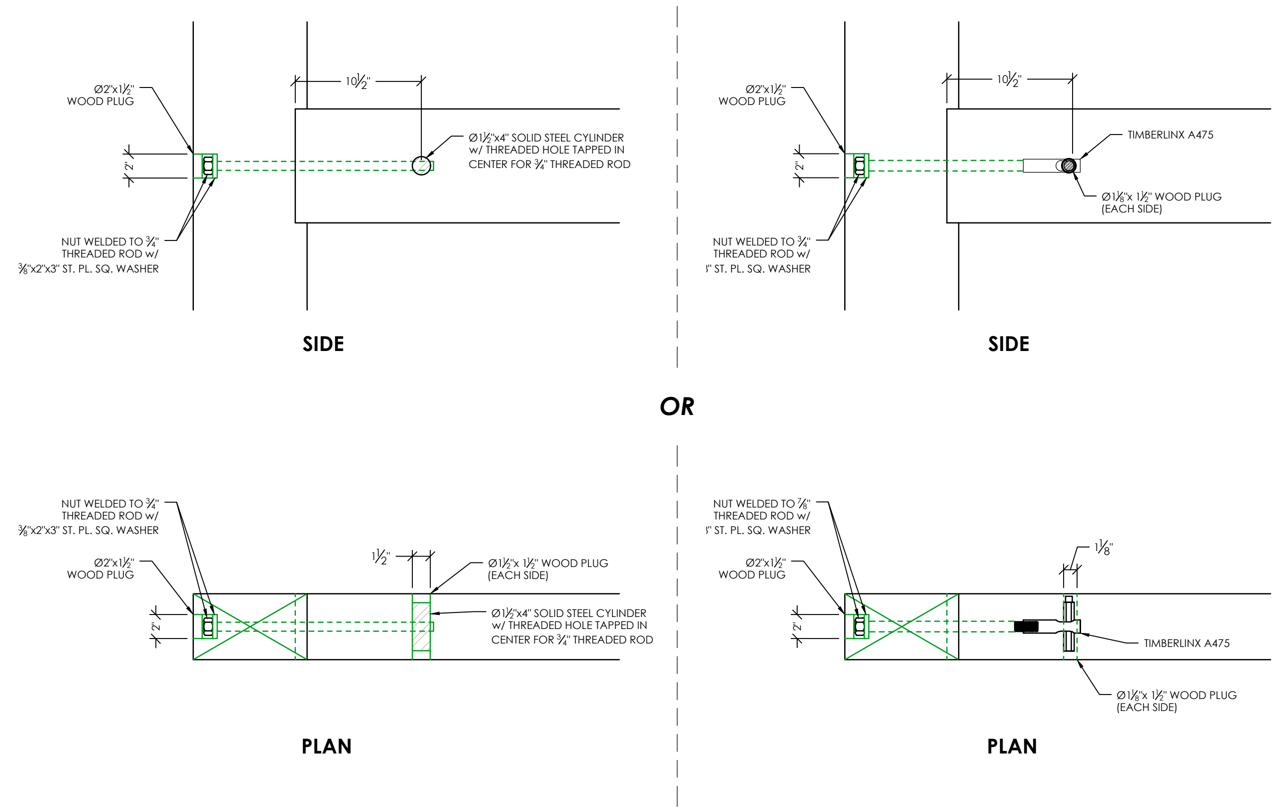
BIDDING DOCUMENTS

GLENVILLE TIMBERWRIGHTS



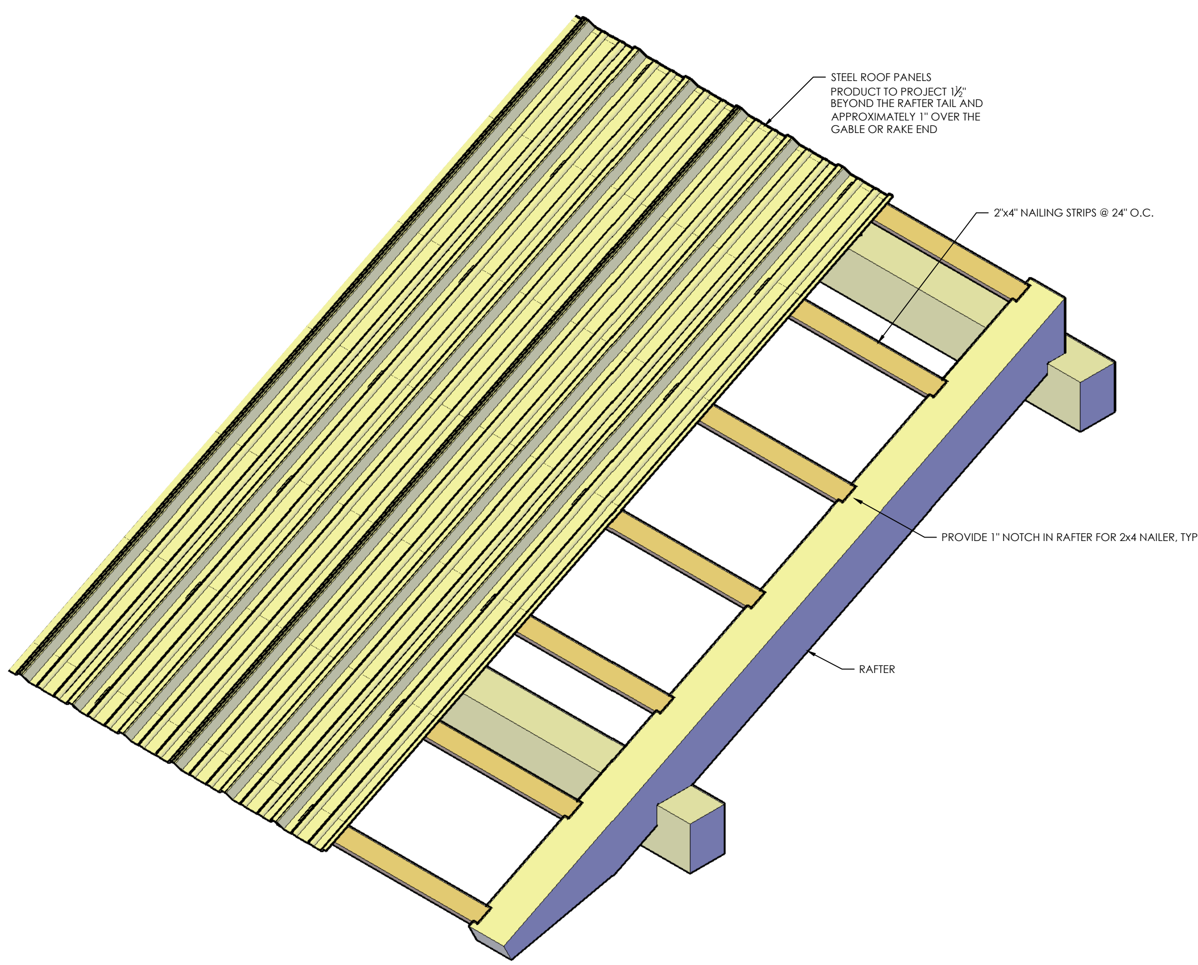
4 TIMBERLINX A475 DETAIL

SCALE: ¾" = 1'-0" (11x17)



3 TYPICAL HIDDEN BOLT DETAIL

SCALE: ¾" = 1'-0" (11x17)



2 TYPICAL STEEL ROOF DETAIL

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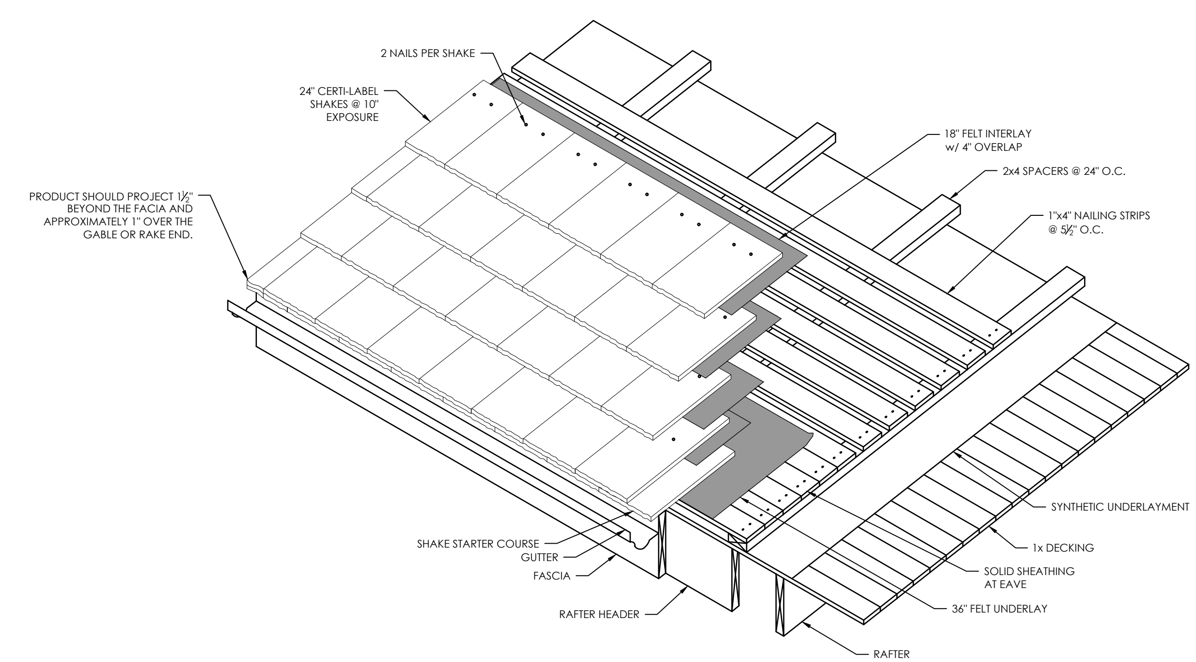

1 TYPICAL SHAKE ROOF DETAIL

SCALE: ⅜" = 1'-0" (11x17)

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FRAMING DETAILS
McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS
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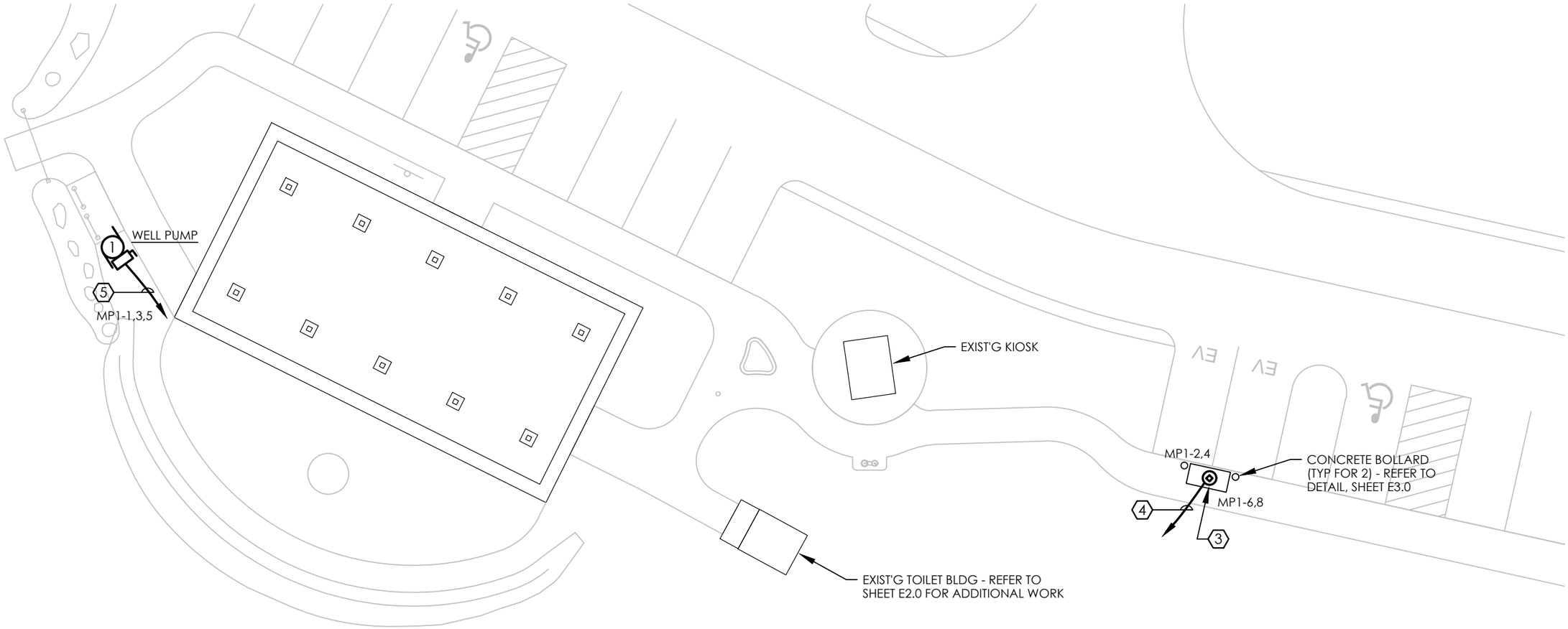
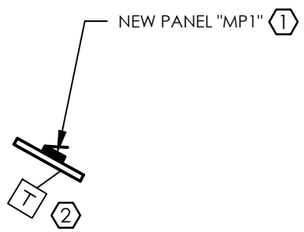
DANE COUNTY, WI

NO.	BY	DATE	REVISIONS

SCALE 0 X

DRAWN BY	SRR
REVIEWED BY	LAL
ISSUE DATE	AUG. 2021
GEC FILE NO.	2-0321-169
SHEET NO.	A4.1





PLAN NOTES:

1. NEW PANEL "MP1" MOUNTED ON WOOD BACKBOARD - REFER TO DETAIL, SHEET E4.0. EXACT LOCATION OF BACKBOARD SHALL BE DETERMINED BY OWNER.
2. UTILITY TRANSFORMER BEHIND BACKBOARD. EXACT LOCATION SHALL BE DETERMINED BY ENGINEER & UTILITY CO.
3. NEW EV CHARGING STATION ON 3'x6' CONCRETE PAD - REFER TO DETAILS, SHEET E3.0.
4. 6#8, 1#10G, 1 1/4"C FROM PANEL "MP1" TO EV CHARGING STATION (2 @ 40.0A, 208V, 1Ø).
5. 3#10, 1#12G, 1"C FROM PANEL "MP1" TO WELL PUMP (2 HP, 208V, 3Ø).

1 PARTIAL SITE PLAN - ELECTRICAL
SCALE: 1/16" = 1' - 0" (11x17 FORMAT)

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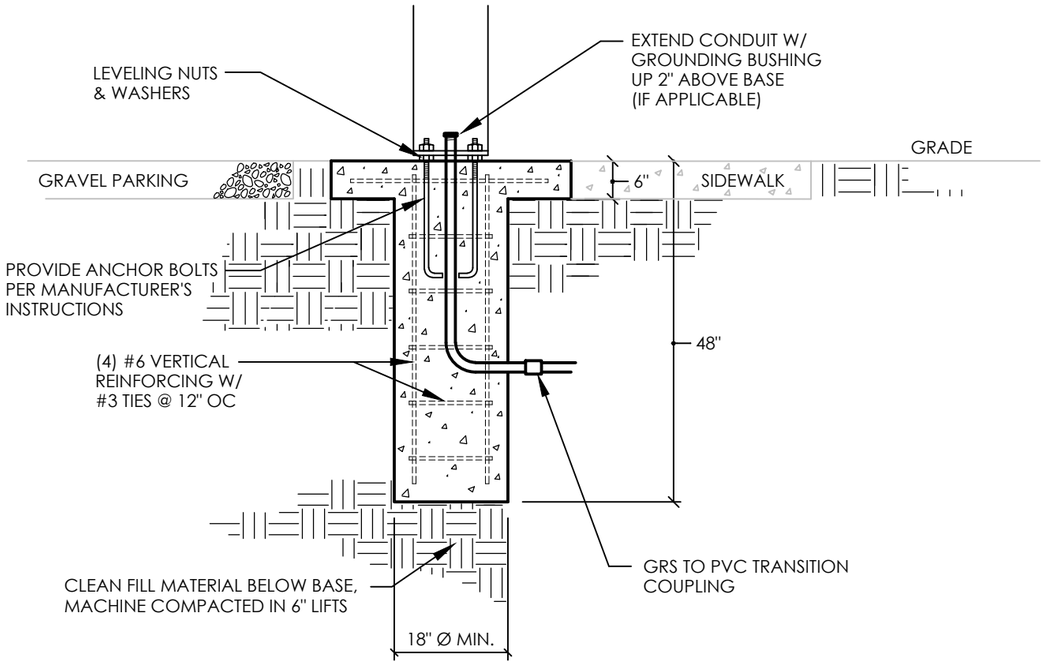
PARTIAL SITE PLAN - ELECTRICAL
McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

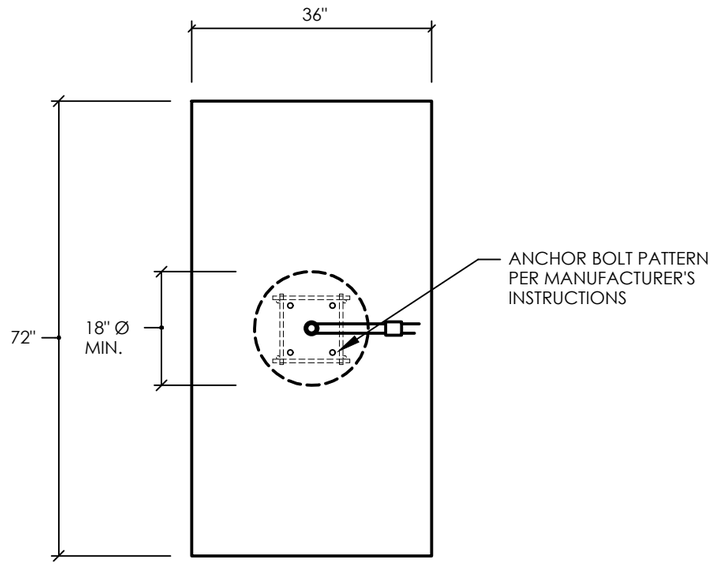
REVISIONS	NO.	BY	DATE

N E S W
0 0
SCALE

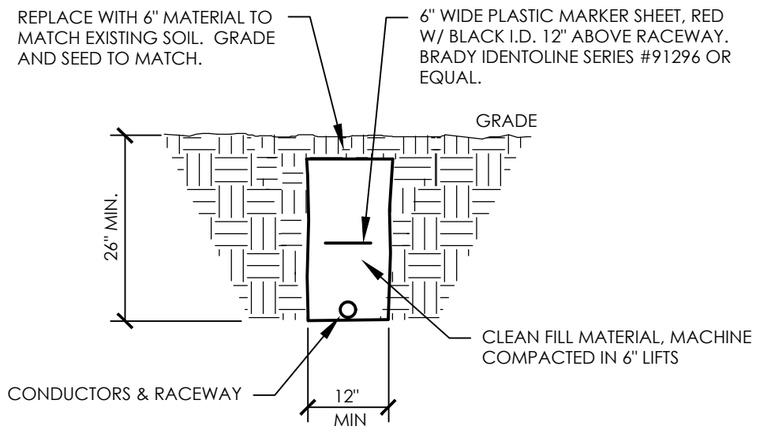
DRAWN BY	RDH
REVIEWED BY	RDH
ISSUE DATE	JAN 2022
GEC FILE NO.	2-0321-169
SHEET NO.	E1.0



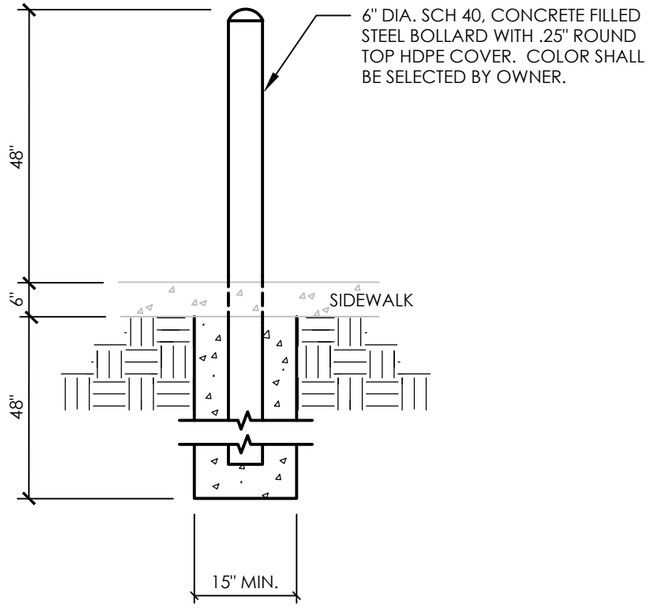
1 EV CHARGING STATION INSTALLATION DETAIL - SECTION
NO SCALE



2 EV CHARGING STATION INSTALLATION DETAIL - PLAN VIEW
NO SCALE



3 TRENCHING DETAIL - TYPICAL
NO SCALE



4 EV CHARGING STATION BOLLARD DETAIL
NO SCALE

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DETAILS - ELECTRICAL
McCARTY PARK IMPROVEMENTS
DANE COUNTY PARKS

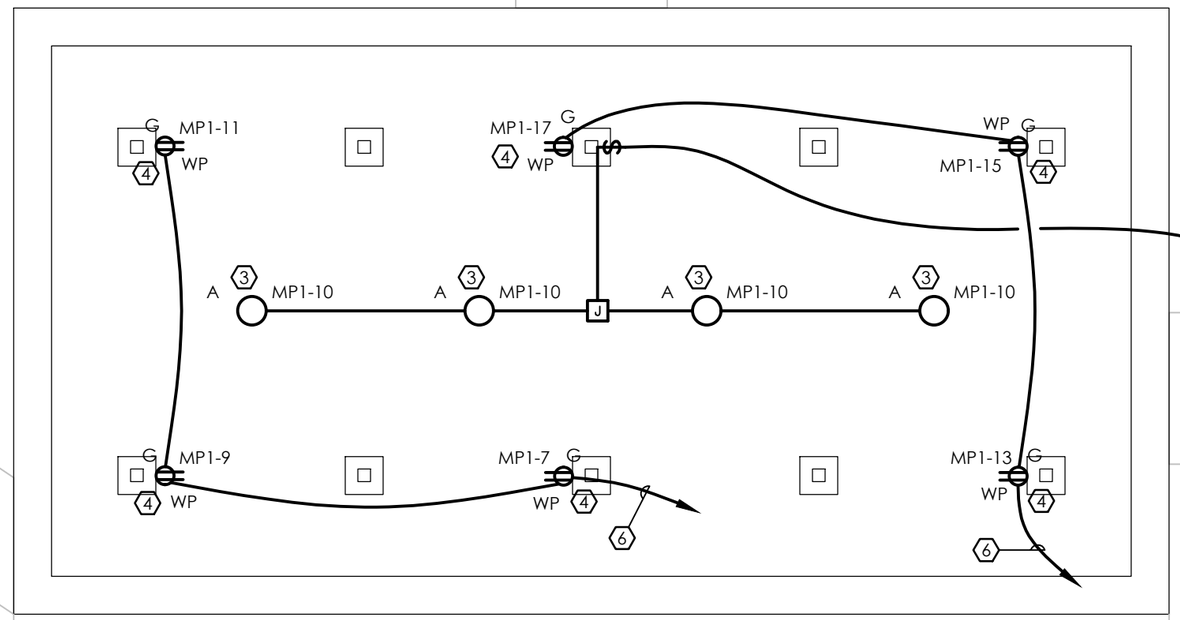
TOWN OF SUN PRAIRIE
DANE COUNTY, WI

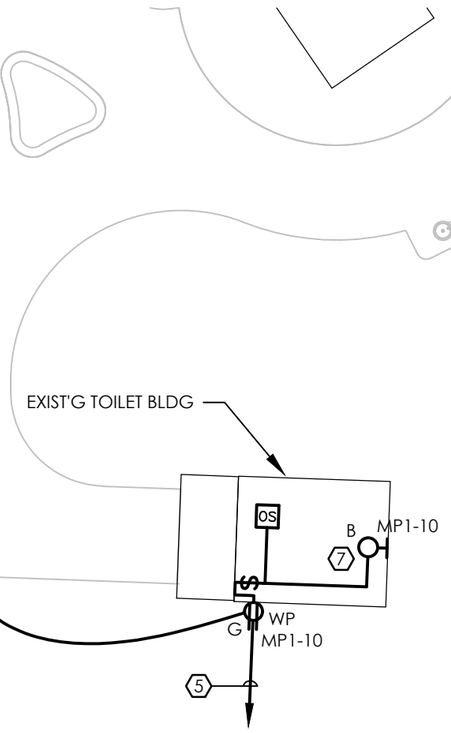
NO.	BY	DATE	REVISIONS

0 SCALE 0

DRAWN BY	RDH
REVIEWED BY	RDH
ISSUE DATE	JAN 2022
GEC FILE NO.	2-0321-169
SHEET NO.	E3.0

BIDDING DOCUMENTS

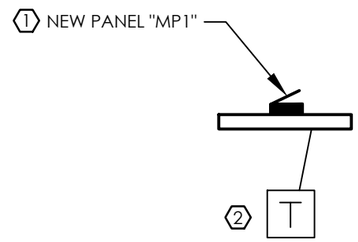




EC SHALL CAREFULLY PAINT ALL EXPOSED RACEWAY, BOXES, AND FITTINGS, WITHIN THE SHELTER, TO CLOSELY MATCH FINISH OF SURFACE ON WHICH THE RACEWAY, BOXES, AND FITTINGS ARE FASTENED. THIS WORK SHALL BE PERFORMED TO THE COMPLETE SATISFACTION OF THE OWNER.

PLAN NOTES:

1. NEW PANEL "MP1" MOUNTED ON WOOD BACKBOARD - REFER TO DETAIL, SHEET E4.0. EXACT LOCATION OF BACKBOARD SHALL BE DETERMINED BY OWNER.
2. UTILITY TRANSFORMER BEHIND BACKBOARD. EXACT LOCATION SHALL BE DETERMINED BY ENGINEER & UTILITY CO.
3. FIXTURES SHALL BE MOUNTED TO BOTTOM OF WOOD BEAM. INSTALLATION OF FIXTURES AND ASSOCIATED WIRE & CONDUIT SHALL BE CLOSELY COORDINATED WITH GC.
4. RECEPTACLES SHALL BE MOUNTED FLUSH IN STONE COLUMN BASE, 18" CL AFF.
5. 2#10, 1#12G, 1"C FROM PANEL "MP1".
6. 4#10, 1#12G, 1"C FROM PANEL "MP1".
7. SURFACE MOUNT FIXTURE INDIRECTLY, 8'-0" AFF.



1 **PARTIAL SITE PLAN**
SCALE: 1/8" = 1' - 0" (11x17 FORMAT)

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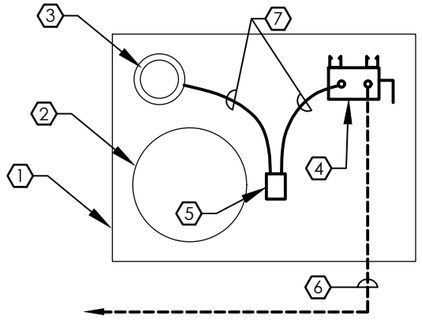
PARTIAL SITE PLAN - ELECTRICAL
McCARTHY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
DANE COUNTY, WI

NO.	BY	DATE
REVISIONS		

0 SCALE 0

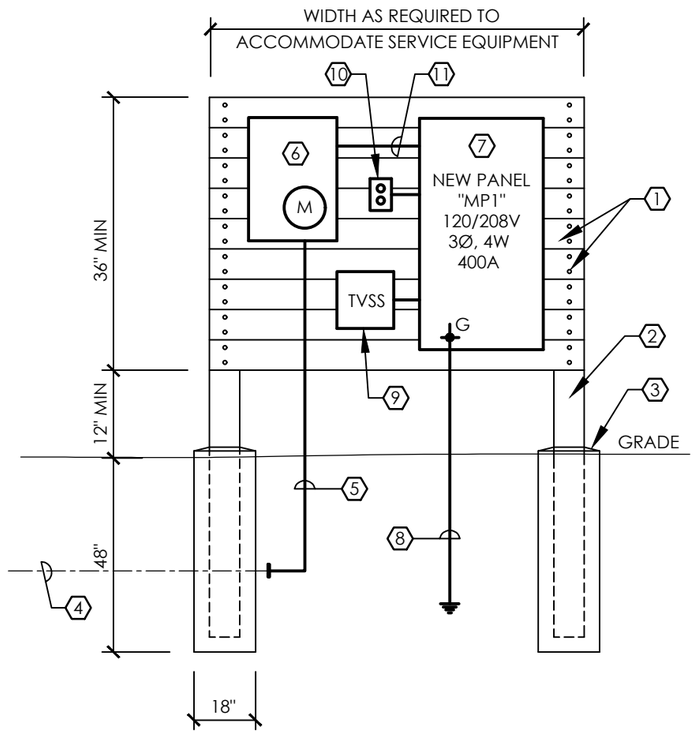
DRAWN BY	RDH
REVIEWED BY	RDH
ISSUE DATE	JAN 2022
GEC FILE NO.	2-0321-169
SHEET NO.	E2.0



1 WELL EQUIPMENT ENCLOSURE PLAN
NO SCALE

WELL EQUIPMENT ENCLOSURE PLAN NOTES:

1. EQUIPMENT ENCLOSURE ON CONCRETE SLAB BY OTHERS.
2. PRESSURE TANK BY OTHERS.
3. WELL CASING WITH SUBMERSIBLE PUMP BY OTHERS.
4. PROVIDE 30/3 NEMA 1 DISCONNECT SWITCH, MT'D ON UNISTRUT.
5. PROVIDE PRESSURE SWITCH - COORDINATE EXACT REQUIREMENTS WITH EQUIPMENT SUPPLIER.
6. UNDERGROUND CKT IN RIGID CONDUIT FROM PANEL "MP1".
7. 3#10, 1#12G, IN 1" LIQUIDTIGHT CONDUIT.



ALL WOOD COMPONENTS SHALL BE COMMERCIALLY PRESSURE TREATED AGAINST DECAY. PLANKS SHALL BE LEVEL AND ATTACHED WITH GALVANIZED HARDWARE.

2 POWER RISER/BACKBOARD DETAIL
NO SCALE

POWER RISER/BACKBOARD DETAIL NOTES:

1. 2" x 6" WOOD PLANKS, BOLTED TO VERTICAL POSTS.
2. 6" x 6" WOOD POSTS, SET IN CONCRETE.
3. TOP OF CONCRETE SHALL BE CHAMFERED AWAY FROM POST FOR DRAINAGE.
4. SECONDARY SERVICE CONDUCTORS BY ALLIANT ENERGY. COORDINATE ALL REQUIREMENTS.
5. PROVIDE CONDUIT IN ACCORDANCE WITH ALLIANT ENERGY REQUIREMENTS.
6. PROVIDE APPROVED 400A METER SOCKET IN ACCORDANCE WITH ALLIANT ENERGY REQUIREMENTS.
7. NEW 400A, 42 SPACE, NEMA 3R, PANELBOARD WITH 400A MAIN CIRCUIT BREAKER - REFER TO SCHEDULE, THIS SHEET.
8. PROVIDE GROUNDING IN ACCORDANCE WITH ALLIANT ENERGY REQUIREMENTS.
9. PROVIDE TVSS UNIT - MCG #160M-120T. INSTALL IN ACCORDANCE WITH MCG'S WRITTEN INSTRUCTIONS.
10. DUPLEX GFCI RECEPTACLE IN WEATHERPROOF BOX, WITH IN-USE COVER
11. 4#500 MCM, 1#3G, 3"C.

FIXTURE SCHEDULE

REFER TO SPECIFICATIONS FOR SUBSTITUTE FIXTURE REQUIREMENTS

TYPE	MANUFACTURER	CATALOG NO.	VOLTS	LAMPS	MT'G.	REMARKS
A	ABOLITE	RD300-17L-UNV-30-PGG6-SVG-LDS96WL	120	LED INCLUDED	STEM	18" RLM FIXTURE WITH PRISMATIC JAR & WIRE GUARD [1]
B	ENVOY	ELEDWPA25W	120	LED INCLUDED	WALL	WALL BRACKET

FIXTURE SCHEDULE NOTES:

[1] PROVIDE FIXTURE WITH THE FOLLOWING ACCESSORIES: #BC600 3-SVG (CANOPY); #GGDC6-GWT (GLOBE GUARD); #ST 24 3-SVG (STEM).

PANELBOARD SCHEDULE

PANEL NO.	VOLTS	MAINS		BREAKERS						CABINET TYPE	ROOM	REMARKS
				1 POLE		2 POLE		3 POLE				
		BUS	BRKR	AMP	QTY	AMP	QTY	AMP	QTY			
MP1	120/208 3Ø, 4W	400A	400A	20	10	40	2	20	1	SURFACE	EXT	42 CIRCUIT NEMA 3R PANELBOARD
				--	--	--	--	30	1			
				--	--	--	--	--	--			
				--	--	--	--	--	--			

ELECTRICAL SYMBOLS

- LED LIGHT FIXTURE, SURFACE/PENDANT MT'D
- LED LIGHT FIXTURE, SURFACE/WALL MT'D
- OS — ULTRASONIC OCCUPANCY SENSOR - CEILING MT'D, WATTSTOPPER #W-500A OR APPROVED EQUAL - SUBMITTALS REQUIRED
- DUPLEX RECEPTACLE, "G" INDICATES GFCI TYPE, "WP" INDICATES DEVICE TO BE FURNISHED WITH WEATHERPROOF COVER
- 1 — MOTOR CONNECTION, NUMBER CORRESPONDS WITH SCHEDULE
- BRANCH CIRCUIT PANELBOARD
- DIRECT EQUIPMENT CONNECTION
- J — JUNCTION BOX, 4"x4"x2 1/8" (UNO)
- NON-FUSIBLE DISCONNECT SWITCH

ELECTRICAL ABBREVIATIONS

AFF	---	ABOVE FINISHED FLOOR	GC	---	GENERAL CONTRACTOR
AFG	---	ABOVE FINISHED GRADE	OC	---	ON CENTER
C	---	CONDUIT	TYP	---	TYPICAL
CL	---	CENTERLINE	UNO	---	UNLESS NOTED OTHERWISE
EC	---	ELECTRICAL CONTRACTOR	WP	---	WEATHERPROOF
G	---	GROUND			

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SYMBOLS, SCHEDULES, DETAILS
McCARTY PARK IMPROVEMENTS
DANE COUNTY PARKS

TOWN OF SUN PRAIRIE
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